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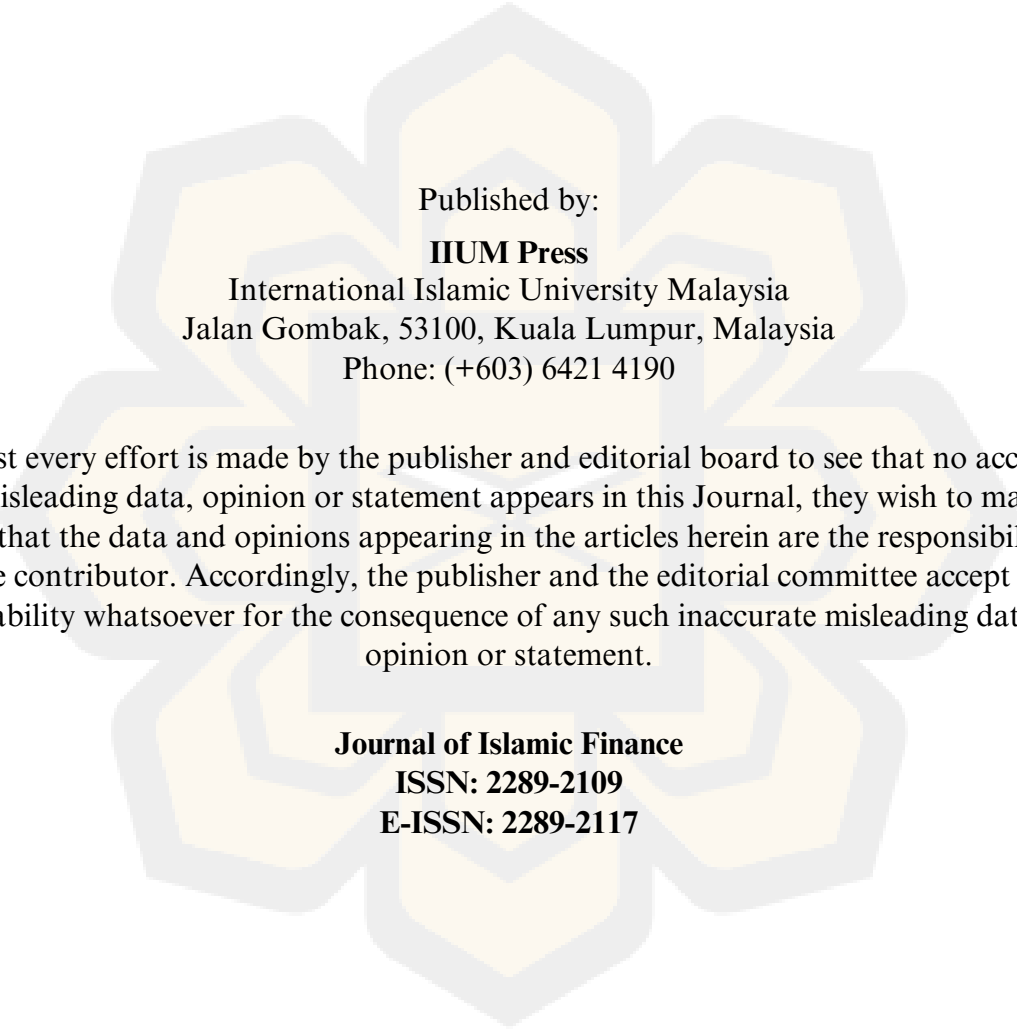
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Economic Diversification and Sustainable Development in Bahrain, 2015–2024: The Moderating Role of Islamic Banking Performance

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Abstract

The objective of this study is to evaluate the impact of economic diversification on sustainable development in Bahrain over the 2015–2024 period and to examine the moderating role of Islamic banking performance in this relationship. Ten annual observations from official sources were disaggregated into quarterly series ($N = 40$) to allow for dynamic specification. Recognising that interpolation inherently adds no new information, all results are reported at both annual and quarterly frequencies. Furthermore, the findings are subjected to a rigorous eight-part robustness protocol comprising effective-sample inference, a year-block bootstrap, annual estimation, four disaggregation methods, structural break testing, twelve lag orders, four index constructions, and fully modified and dynamic ordinary least squares (OLS) estimations. The results indicate that economic diversification has no substantial direct influence on sustainable development across any dimension. This finding holds consistently, reflecting a persistent disparity between productive diversification, with non-oil output accounting for 82.5% of GDP, and fiscal diversification, with non-oil revenue accounting for only 28.0%. Conversely, Islamic banking performance is positively associated with sustainable development at both data frequencies and under all index constructions, although the specific dimension driving this association remains undetermined. While the moderation coefficient is negative in the reported baseline specification ($\delta = -0.044$, $p = 0.006$), it is highly unstable across robustness checks, being significantly negative in six, significantly positive in eight, and insignificant in fifteen of twenty-nine specifications. Notably, all negative estimates rely on interpolation smoothing and a lag order rejected by both information criteria. This study introduces the first three-variable moderated model applied to Bahrain's macroeconomic context. Its primary contribution is methodological: it demonstrates that the observed negative moderation effect is largely an artefact of specific modelling choices, while better-specified estimators suggest an amplification effect rather than a buffering effect.

Keywords: Economic diversification, Sustainable development, Islamic banking performance, Temporal disaggregation, Small-sample inference

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1. Introduction

Rentier economies rely on a single natural resource for a substantial share of their public revenues, rendering them vulnerable to price shocks, fiscal volatility, and limited long-term growth. Bahrain is a notable outlier within the Gulf Cooperation Council (GCC) region, characterised by limited reserves, an early peak in onshore production, and government finances that remain exposed to oil price fluctuations despite years of diversification policies (Nakibullah, 2018; Espinoza & Senhadji, 2011). Although oil and gas continue to constitute a substantial share of government revenue, non-oil sectors now account for approximately four-fifths of real GDP. This persistent divergence motivates the central question of this study: has the diversification of production contributed to sustainable development, and if not, under what conditions might it do so? Theoretical frameworks provide grounds for questioning any automatic relationship between diversification and development. Structural change theory posits that diversification promotes development only when

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resources are reallocated towards more productive activities with strong export potential (Hvidt, 2013). Furthermore, the resource curse literature suggests that even as the oil sector's share of output declines, hydrocarbons can continue to dominate the macroeconomic cycle through fiscal channels (Gylfason et al., 1999). Financial intermediation theory offers an additional link by emphasising that banks influence not only the pace of economic growth but also its quality, as they determine which activities receive long-term financing (Levine, 2005). This perspective is particularly pertinent to Islamic banks, whose financing modalities—such as *musharakah* and *mudarabah*—tie credit to real assets and involve risk sharing with the financed enterprise (Chapra et al., 2008). Additionally, their broader social-finance instruments may promote financial inclusion among groups facing barriers in conventional credit markets.

Bahrain hosts one of the most established Islamic banking sectors in the region, with fifteen banks operating under a dedicated Central Bank of Bahrain regulatory framework. Previous empirical work has generally examined the relevant relationships in isolation. For instance, studies on diversification and development, such as Al-Doski and Al-Arkoub (2023), largely omit the financial sector, whereas research focusing on Islamic banking and development (Alghafes et al., 2024; Asaad & Al-Saad, 2025) overlooks the banking sector's role in the broader economic diversification process. To the best of the authors' knowledge, no prior study has estimated a three-variable model in which Islamic banking performance moderates the effect of economic diversification on sustainable development in Bahrain.

A critical data limitation inherent to this study must be acknowledged: the empirical analysis is based on only ten annual observations, which necessarily limits the statistical power of the empirical analysis and the strength of the conclusions that can be drawn. The quarterly series utilised for dynamic estimation are temporally disaggregated from these ten data points and, consequently, introduce no new underlying information. To address this limitation, all results are reported at both annual and quarterly frequencies and are subjected to an extensive robustness protocol. This protocol is explicitly designed to distinguish findings supported by the underlying data from those that may be sensitive to modelling choices. Therefore, the empirical results should be interpreted as exploratory, and caution is warranted against drawing overly broad generalisations.

Three principal findings emerge. First, economic diversification exerts no significant direct effect on sustainable development across any of the dimensions examined. Second, Islamic banking performance is positively associated with sustainable development at both data frequencies, although the exact transmission channel cannot be definitively established. Third, the interaction effect is highly sensitive to model specification: it is negative under the reported baseline specification but becomes positive under the lag orders preferred by information criteria and under estimators designed to account for cointegrating relationships. Taken together, these findings suggest that the relationship between diversification and sustainable development in Bahrain depends not only on the extent of diversification itself but also on the structural and financial conditions under which it is funded. This interpretation is offered as a proposition for future investigation rather than as a definitive causal mechanism established by the present analysis.

2. Literature Review

2.1 Diversification and sustainable development

Economic diversification involves widening the productive base and sources of income so that output and government revenue are not dependent on a single sector. It encompasses productive, export, and revenue dimensions, and this distinction is important: an economy may diversify its production while its budget remains reliant on resource revenues. This is reflected in the evidence from the GCC. Espinoza and Senhadji (2011) demonstrate that non-oil growth in the Gulf remains linked to oil prices through public spending. Nakibullah (2018) notes that Bahrain non-oil growth is accompanied by fiscal dependence on oil. Al-Doski and Al-Arkoub (2023) estimate an inverse relationship between oil reliance and fiscal sustainability across the GCC over the period 2004–2020. Our measure of diversification is a composite of three indicators: the share of non-oil output, the share of non-oil revenue, and the share of manufacturing. It is therefore a cruder measure than the concentration measures commonly employed in the literature. Theil and Herfindahl-Hirschman indexes of export concentration, as well as the Economic Complexity Index, capture compositional diversification in ways that a share-based composite cannot. The present metric was used because its components are available annually for Bahrain throughout the entire study period, unlike disaggregated export and value-added statistics. It represents a measurement compromise and limits comparability with cross-country studies.

The conventional operationalisation of sustainable development, namely, the ability to meet present needs without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987), is categorised across economic, social, and environmental dimensions.

Cross-country research indicates that diversified economies outperform resource-concentrated ones, although the literature is divided on the underlying mechanisms. For [Hvidt \(2013\)](#), the binding condition is compositional: diversification matters only when it involves meaningful structural change towards higher-productivity tradable activities. Hence, an increase in the non-oil share resulting from non-tradable expansion should have no effect. For [Gylfason et al. \(1999\)](#), the issue is allocative: resource economies channel funding towards short-term activities irrespective of sectoral composition, so the failure operates through the financial system. These two diagnoses may appear similar in aggregate statistics but imply opposite remedies—industrial policy versus financial reform—and neither the GCC nor the Bahraini literature has clearly distinguished between them. A model that incorporates the financial sector as a conditioning variable can help distinguish a compositional failure from an allocative failure, whereas dominant bivariate designs cannot. This study addresses this gap by incorporating the financial sector into the analysis.

H1. Economic diversification has a statistically significant effect on sustainable development in Bahrain, both in composite form (H1) and across its economic (H1a), social (H1b), and environmental (H1c) dimensions.

2.2 Islamic Banking Performance and Sustainable Development

Conventional profitability ratios are not sufficient to measure the performance of Islamic banks. The *maqasid al-Shariah* paradigm asserts that an Islamic bank is an institution that exists to promote public benefit and prevent harm by protecting wealth through productive rather than speculative finance, assisting those in need to safeguard society, and preserving the environment through responsible stewardship ([Chapra et al., 2008](#); [Dusuki & Bouheraoua, 2011](#)). This perspective has led to composite metrics that incorporate both financial ratios and sustainability indicators. However, critical literature cautions that some banks invoke the concept of sustainability without genuinely incorporating it into their financing policies.

Recent empirical evidence reflects these varying degrees of integration. [Alghafes et al. \(2024\)](#) find that the implementation of environmental, social, and governance (ESG) practices improves the financial performance of GCC Islamic banks, adding that the environmental dimension requires deliberate strategic action, whereas the social and governance dimensions are more naturally aligned with Islamic finance principles. [Asaad and Al-Saad \(2025\)](#) find that zakat, waqf, *qard hasan*, and *musharakah* instruments are utilised to reduce poverty and promote equity. [Otman \(2022\)](#) demonstrates that banks with a developmental orientation contribute more effectively to macroeconomic goals, whereas banks focusing on short-term products have a weaker impact. [Avdukic and Asutay \(2025\)](#) identify a continuing discrepancy between declared moral-economy orientations and measurable development impacts. In the local context, [Abdulla et al. \(2021\)](#) note the early institutional adoption of sustainability in Bahrain, although clear performance requirements remain absent.

Islamic banks may have measurable effects when their instruments are directly linked to specific development outcomes, but their impact may be weaker when the relationship operates solely through aggregate productive investment. A common limitation of these studies is that they treat bank performance strictly as an independent driver of development. None examines whether banking performance alters the developmental returns of structural reform—that is, whether it operates through the diversification–development relationship rather than merely alongside it. Establishing that banking performance contributes to development does not, by itself, indicate whether it makes economic diversification more or less developmentally productive. This is the second critical question that must be addressed in a rentier economy pursuing a diversification strategy.

H2: The performance of Islamic banks has a statistically significant effect on sustainable development in Bahrain, both in its composite form and across its economic (H2a), social (H2b), and environmental (H2c) dimensions.

2.3 The Role of Islamic Banking Performance as a Moderator

It is not only the direction of the moderation effect that remains uncertain. The two theoretical frameworks predict conflicting signs, which makes the empirical test informative. Financial intermediation theory

suggests an amplification effect. If banks constitute the channel through which structural change is transformed into productive investment, then a more developed banking sector would increase the developmental return at any given level of diversification, and the interaction effect should therefore be positive (Levine, 2005). The *maqasid* framework, by contrast, implies a substitution effect. A bank that aims to protect society and the environment can generate welfare through *zakat*, *qard hasan*, and environmental financing, none of which depends on structural transformation. As banking performance increases, the economy may rely less on what the diversification process provides, and the interaction effect should therefore be negative (Dusuki & Bouheraoua, 2011). A functioning banking system may operate through both mechanisms simultaneously. The estimated sign is therefore an empirical question concerning which mechanism dominates, while a null effect would indicate that the two mechanisms offset each other.

H3: The performance of Islamic banks significantly moderates the relationship between economic diversification and sustainable development in Bahrain.

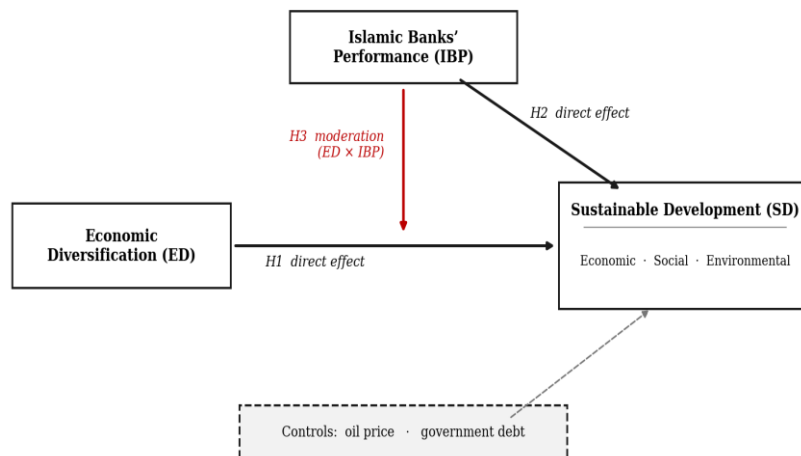


Fig. 1. Conceptual model

3. Research Methodology

The unit of analysis is the Bahraini economy during the period 2015–2024. This decade encompasses the 2015–2016 oil price collapse, the COVID-19 shock, the subsequent recovery, and the acceleration of Economic Vision 2030. Annual data ($N = 10$) were gathered from the Ministry of Finance and National Economy, Central Bank of Bahrain Financial Stability Reports, the Information and eGovernment Authority, the UNDP, the World Bank World Development Indicators, and the IMF World Economic Outlook. Banking metrics were aggregated at the sector level using annual reports of licensed Islamic banks.

The sample has ten independent observations, and no procedure applied here alters that. The annual data were disaggregated into quarterly series ($N = 40$) following Chow and Lin (1971) and the Denton–Cholette method, subject to the restriction that the four quarters in each year reproduce the corresponding annual value (Sax & Steiner, 2013). This was done for one reason: specifications with lag structures in a dynamic context cannot be estimated using only ten observations. Disaggregation produces an intra-year path consistent with annual totals; it does not generate additional information, and the effective information content of the quarterly dataset remains the ten annual values. Two implications follow and are treated as first-order issues. First, the interpolation structure induces serial correlation; therefore, the Newey–West adjustment is used to reduce the potential anti-conservativeness of the standard errors for the $N = 39$ observations. Inference based solely on the quarterly frequency may reflect imposed smoothness rather than underlying economic activity. Second, an interpretive problem arises because the Chow–Lin estimator requires a quarterly indicator series associated with the target variable, and no such series was available for any variable. When no indicator is used, the estimator effectively smooths the series subject to the annual constraints and is not substantially different from the Denton–Cholette method. This explains why, as shown in Section 4.5, the two methods produce similar results while differing from methods that impose less smoothing.

There are three composite indices. The components are standardised to have a mean of zero and a variance of one across the ten annual observations, and each composite is calculated as an equally weighted average of

its standardised components. Equal weighting is intentional: without a theoretically motivated weighting scheme or a sufficiently large sample to estimate weights, alternative weighting would impose a structure that the data cannot reliably sustain. Sensitivity to alternative weighting schemes is discussed in Section 4.5. Economic diversification (ED) is the sum of the non-oil portion of real GDP, the non-oil share of government income, and the contribution of manufacturing to GDP. Sustainable development (SD) is a composite index combining three standardised sub-indices reflecting economic, social, and environmental dimensions. Islamic banking performance (IBP) is a sector-level aggregate of asset-quality and financial-soundness metrics for Islamic banks. Documentation at the component level is provided in the Appendix.

A limitation of the index documentation belongs here, rather than in the limitations section, because it bears on how the results should be interpreted. The component-level series underlying the three composites are no longer available; only the composite indices and a subset of their components could be recovered. The Appendix therefore documents the construction as specified rather than as independently verified. Evidence of reliability can be reported for the sustainable development index, for which the three-dimension series remain available, but not for the diversification or banking-performance indices. Accordingly, all three composites should be regarded as undocumented at the component level. Each model includes two control variables: international oil price (OIL), reflecting the direct effect of the oil cycle, and government debt-to-GDP (DEBT), reflecting the debt-financed component of non-oil growth. DEBT has a substantial association with diversification ($r = 0.878$) and also contributes to the collinearity reported in Section 4.3.

3.1 Specification and estimation

There are three hypotheses and three equations:

$$SD_t = \alpha_0 + \alpha_1 ED_t + \alpha_2 SD_{t-1} + \alpha_3 OIL_t + \alpha_4 DEBT_t + \varepsilon_t \quad (1)$$

$$SD_t = \gamma_0 + \gamma_1 ED_c + \gamma_2 IBP_c + \gamma_3 SD_{t-1} + \gamma_4 OIL_t + \gamma_5 DEBT_t + v_t \quad (2)$$

$$SD_t = \delta_0 + \delta_1 ED_c + \delta_2 IBP_c + \delta_3 (ED_c \times IBP_c) + \delta_4 SD_{t-1} + \delta_5 OIL_t + \delta_6 DEBT_t + v_t \quad (3)$$

To reduce collinearity between the interaction term and its components, ED and IBP were mean-centred before multiplication. The test of H3 is performed using the coefficient δ_3 . Equations 1 and 2 are re-estimated with each dimension of SD as the dependent variable. The lagged dependent variable accounts for the usual persistence of development indicators and results in the loss of one observation; therefore, quarterly regressions are estimated using $N = 39$ and annual regressions using $N = 9$. The specification is a dynamic regression in levels rather than an error correction model. Equations 1 to 3 do not include an error correction term and do not generate an adjustment speed; therefore, the framework should not be categorised as ARDL/ECM. However, the error correction representation is estimated separately in Section 4.5 because the result is directly relevant to the bounds tests.

Integration order was tested using the Augmented Dickey–Fuller and Phillips–Perron tests. Bounds testing was performed using the method proposed by [Pesaran, Shin, and Smith \(2001\)](#). The diagnostic tests indicated autocorrelation and heteroskedasticity; therefore, all standard errors are estimated using Newey–West heteroskedasticity and autocorrelation consistent (HAC) standard errors with four lags. Since robust standard errors are not sufficient to address the inferential problem arising from disaggregation, an eight-part robustness protocol is adopted: effective-sample-size inference based on ten rather than thirty-nine observations; a year-block bootstrap resampling whole years (5,000 replications); direct annual estimation; four alternative disaggregation methods; Quandt–Andrews structural break testing with COVID variants ([Andrews, 1993](#)); twelve ARDL(p, q) lag orders selected using AIC and SIC; four alternative index constructions; and fully modified OLS ([Phillips & Hansen, 1990](#)) with dynamic OLS. A result is deemed supported only if it passes this protocol.

4. Results

4.1 Descriptive statistics and correlation

Table 1 presents descriptive statistics at the annual frequency, reflecting the level at which the data were originally observed. Two features emerge prior to the regression analysis. First, the average non-oil share of GDP (82.46%) is substantially higher than the average non-oil share of government revenue (27.99%),

indicating that production has diversified much more than government revenue. Second, a high capital adequacy ratio (20.01%) coexists with a modest return on assets (0.47%), suggesting that some of the sector's capital strength may not be translating into high-return productive investment.

Table 1. Descriptive statistics, 2015–2024 (N = 10)

Variable	Mean	SD	Min	Max
Economic diversification (composite)	0.000	0.702	−0.901	1.255
Share of GDP from non-oil sector (%)	82.46	2.11	79.50	86.00
Share of non-oil revenue (%)	27.99	6.87	18.50	38.50
Manufacturing share of GDP (%)	14.47	0.38	13.60	14.90
Composite sustainable development	0.000	0.484	−0.472	0.914
Performance (composite) of Islamic banks	0.000	0.969	−0.821	1.932
Return on assets (%)	0.470	0.330	0.100	1.100
Capital adequacy ratio (%)	20.01	3.70	16.80	27.70
Human Development Index	0.881	0.014	0.859	0.899
Oil price (USD/barrel)	66.07	18.45	41.80	99.80
Government debt to GDP (%)	106.4	23.08	66.70	134.0

Note: Composite indices are standardised. Descriptive statistics are not provided for the interpolated quarterly series since doing so would misrepresent the sample size.

The correlation analysis identifies three associations of interest. Islamic banking performance is strongly correlated with sustainable development ($r = 0.911$), economic diversification is correlated with sustainable development ($r = 0.703$), and economic diversification is strongly correlated with government debt ($r = 0.878$). This final association is of particular substantive relevance, as it suggests that a portion of Bahrain's non-oil growth may be linked to government debt rather than private-sector-led expansion. Furthermore, these high pairwise correlations caution against interpreting the simple associations causally, as diversification and sustainable development may be jointly influenced by common macroeconomic factors, such as oil prices and government spending.

4.2 Integration, Cointegration, and Causality

All series in the quarterly data are non-stationary in levels and stationery in first differences, except for oil, which is marginally stationary in levels. The results of these tests must be interpreted with caution: mechanical smoothing of the data increases persistence and biases unit root tests towards non-rejection. Consequently, the uniform $I(1)$ classification may be partly an artefact of the interpolation rather than an underlying structural property of the Bahraini economy, while the underlying annual sample of $N = 10$ is too small to support meaningful unit root testing.

The bounds tests help distinguish between the two candidate relationships. The model relating development to banking performance alone produces an F -statistic of 9.227, which exceeds the upper bound at the 1% level. The joint model produces an F -statistic of 5.922, which exceeds the upper bound at the 5% level. In contrast, the model linking development to diversification alone produces an F -statistic of 0.006, which is well below the lower bound. These tests may be oversized when applied to interpolated data, and the effective sample size is well below the range for which the tabulated critical values apply. Therefore, the results are presented as indicative of relative strength rather than as definitive evidence of cointegration. The Granger causality tests reveal no evidence that diversification precedes development at any of the lags tested, whereas banking performance precedes development at two lags ($F = 11.198$, $p < .001$).

4.3 Regression results

The three primary specifications are reported in Table 2. The diversification coefficient in Model 1 is positive but far from significant ($\beta = 0.010$, $p = .625$). Instead, persistence dominates, as evidenced by a lagged development coefficient of 1.026.

This coefficient warrants careful attention. If the coefficient is equal to or greater than unity, the process is non-mean-reverting, in which case a levels specification is inappropriate and the remaining coefficients are estimated in a near-unit-root regression with non-standard inference. Formally, we cannot reject the null

hypothesis of $\phi = 1$ for Model 1 ($t = 0.617, p = .541$) or Model 3 ($t = 0.116, p = .909$). The development composite is therefore consistent with a random-walk process over this window. This means that the level relationships suggested by the bounds tests rest on a dependent variable whose own dynamics cannot be distinguished from a unit root, and the standard errors on the remaining regressors may not be reliable in the conventional sense. A first-difference specification would avoid this issue but would discard the level relationships that fundamentally motivate this investigation. Given the limitation of ten annual observations, this choice cannot be resolved empirically. In Model 2, banking performance enters positively and significantly ($\beta = 0.066, p = .041$). Model 3 incorporates the interaction term, which is negative and significant ($\delta_3 = -0.044, p = .006$), while economic diversification becomes positive and significant for the first time. At face value, this represents the buffering pattern hypothesized in this study. However, this interpretation does not survive the robustness analysis presented in Section 4.5.

All three models are subject to concerns regarding multicollinearity, as indicated by the variance inflation factors (VIF). In Model 3, all variables identified as significant possess VIFs exceeding the commonly used threshold of 10: diversification (24.8), banking performance (11.9), the interaction term (10.2), the lagged dependent variable (29.9), and debt (47.8). This is consistent with the strong correlation observed between economic diversification and government debt ($r = .878$). This severe collinearity likely explains a pattern that would otherwise be difficult to interpret: the debt coefficient is positive and negligible in Model 2 but negative and substantial in Model 3. Sign reversal across nested specifications is a classic indication of collinearity rather than proof of a substantive economic relationship; therefore, the individual coefficients in Model 3 must be interpreted as imprecise, even when their p -values appear favourable.

Table 2. Regression findings, composite sustainable development (quarterly, N = 39)

Variable	Model 1	Model 2	Model 3
Constant	0.038*** (0.008)	0.034*** (0.008)	0.057*** (0.012)
ED (centred in Models 2, 3)	0.010 (0.020)	0.011 (0.018)	0.087*** (0.030)
IBP (centred)	—	0.066** (0.032)	0.065** (0.033)
ED × IBP	—	—	−0.044*** (0.016)
SD (t−1)	1.026*** (0.042)	0.904*** (0.087)	1.011*** (0.096)
OIL	−0.013 (0.010)	−0.026* (0.015)	−0.044*** (0.016)
DEBT	0.020 (0.019)	0.024 (0.018)	−0.054** (0.023)
R ²	0.9913	0.9928	0.9934
F	1481.0	1880.5	2190.5

Note: Newey-West HAC standard errors (4 lags) in brackets. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. A high R^2 is a consequence of the lagged dependent variable, which on its own explains much of the variance in a very persistent series, and should not be interpreted as explanatory power.

4.4 Results at the dimension level and the form of moderation

The dimension-level estimations are presented in Table 3. Hypotheses H1a through H1c are rejected because economic diversification does not have a significant effect on any individual dimension. Islamic banking performance does not have a significant impact on the economic dimension but has a significant positive impact on the social ($\beta = 0.113, p = .007$) and environmental ($\beta = 0.385, p < .001$) dimensions. The oil coefficients are substantial: positive and significant for the economic dimension ($\beta = 0.399$) and strongly negative for the environmental dimension ($\beta = -0.286$). These results suggest that the economic dimension of sustainable development in Bahrain remains closely linked to the oil cycle, whereas the environmental dimension exhibits an inverse association with oil prices.

Table 3. Dimension level estimates (quarterly, N = 39)

Variable	SD_ECO	SD_SOC	SD_ENV
ED, Equation 1	0.020 (0.867)	−0.018 (0.823)	−0.043 (0.776)
ED, Equation 2 (centred)	0.030 (0.798)	−0.013 (0.798)	0.004 (0.958)
IBP, Equation 2 (centred)	0.114 (0.303)	0.113*** (0.007)	0.385*** (0.000)
OIL	0.399** (0.019)	−0.140** (0.036)	−0.286*** (0.000)

Variable	SD_ECO	SD_SOC	SD_ENV
R ² (Eq. 2)	0.9357	0.8908	0.9572

Note: *p*-values in brackets. Newey-West HAC standard errors (4 lags). Controls and lagged dependent variables included, coefficients not displayed for space. *** $p < 0.01$, ** $p < 0.05$.

The marginal effect of economic diversification decreases monotonically as banking performance increases, falling from 0.128 at the observed minimum to 0.006 at the maximum. Notably, this effect is no longer statistically distinguishable from zero above the IBP_c threshold of 1.18—a level within the observed range that corresponds to the 2023–2024 period of strong banking recovery. Taking the Model 3 estimates at face value, Figure 2 depicts the simple slopes and marginal effects alongside their confidence intervals. However, this interpretation is conditional: the estimates are subject to the fragility of the underlying interaction, which the robustness analysis in Section 4.5 shows to be decisive.

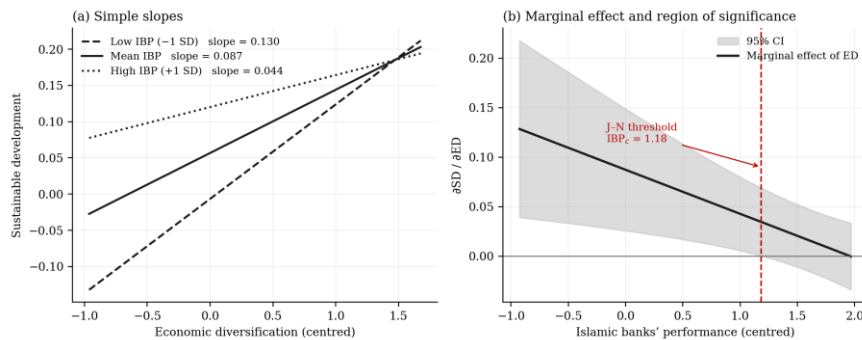


Fig. 2. Simple slopes and the marginal effect of diversification across levels of banking performance

4.5 Robustness

Inference and frequency: When reassessed using degrees of freedom based on the ten annual observations, the interaction retains its sign but becomes statistically insignificant ($p = .071$). Using a year-block bootstrap that resamples complete years, its 95% confidence interval ranges from -0.188 to 0.307 and includes zero. When estimated directly using the annual data, the interaction is negative in all specifications but never significant ($p = .106$ in the complete model and $p = .419$ in the parsimonious model). The annual full specifications also produce lagged dependent-variable coefficients of 2.17 and 2.72, which are not economically interpretable and imply overfitting at $N = 9$. The parsimonious annual model, the only annual specification with sufficient residual degrees of freedom, yields a clear result: economic diversification (0.213, $p = .009$) and banking performance (0.386, $p < .001$) are both positive and significant, while the interaction term is not included.

Dimensional attribution: The dimensional attribution does not survive the annual check. The quarterly estimates attribute the banking influence to the social and environmental dimensions and find no significant effect on the economic dimension. The annual estimates show the opposite pattern: substantial in the economic dimension (0.723, $p = .010$), absent in the social dimension (0.072, $p = .679$), and marginal in the environmental dimension (0.443, $p = .068$). What remains stable across frequencies is that banking performance is favourably associated with development in composite form. This study does not, and cannot, resolve which dimension conveys this association. The reliability evidence below supports this conclusion.

Parameter stability: The Quandt–Andrew’s test indicates a sup-Wald statistic of 414.1 in 2020Q3, confirming the instability indicated by the CUSUM and CUSUMSQ violations. The interaction coefficient changes from -0.190 ($p < .001$) before 2020 to 0.001 ($p = .946$) after 2020, while the banking performance coefficient reverses from -0.802 to $+0.214$. The parameters therefore do not merely change in magnitude; their signs change across regimes. Averaging full-sample estimates across two regimes with opposite signs would therefore obscure the distinct relationships across the regimes.

Order of lag: According to the Akaike and Schwarz criteria, the reported ARDL (1,0) is the weakest of the twelve ARDL (p, q) specifications. Both criteria select ARDL (2,2), with an interaction coefficient of $+0.251$

($p = .004$), which is positive, substantial, and opposite in sign to the reported estimate. Among the twelve specifications, one produces a substantial negative interaction—the specification reported in the baseline results—four produce significant positive interactions, and seven produce insignificant interactions.

The conditional error correction model: The cointegration issue is further examined by directly estimating the error correction representation. The adjustment coefficient is -0.020 ($t = -0.25$), well above the lower bound of -2.86 for $k = 3$ reported by Pesaran et al. (2001), and is statistically indistinguishable from zero ($p = .803$). There is therefore no evidence of error correction; that is, there is no detectable tendency for the system to return to equilibrium following a shock. The implied half-life of approximately 35 quarters is an artefact of dividing by an adjustment coefficient that is statistically indistinguishable from zero. The bounds F-statistic for the lagged levels (5.275) exceeds its upper bound, whereas the t-statistic for the adjustment coefficient is well above its own lower bound. This represents the contradictory-signal case discussed by Pesaran et al. (2001), in which the appropriate conclusion is that the evidence for cointegration is inconclusive. Hence, the framework is referred to as a dynamic regression in levels, and no cointegration is asserted.

Reliability of the index: Cronbach's alpha for the three development dimensions is 0.537 annually and 0.475 quarterly, both below the customary 0.70 criterion. The source of this low internal consistency is the economic dimension, which has a correlation of -0.019 with the social dimension and 0.224 with the environmental dimension. Its item-rest correlation is 0.148 , and deleting this dimension increases alpha to 0.808 . Principal component analysis (PCA) is consistent with this finding: the first component explains 62.5% of the variation, but the second eigenvalue is 1.009 , above the Kaiser threshold, indicating that the index is two-dimensional. PC1 loads 0.94 on the social dimension and 0.97 on the environmental dimension but only 0.23 on the economic dimension. This provides a meaningful interpretation: the economic dimension moves with the oil cycle, whereas the other two do not, suggesting that the composite averages series driven by different underlying forces. The component series for the diversification and banking performance indices are not available; therefore, similar statistics could not be calculated for them. Alternative constructions and alternative estimators the interaction remains significant in one of the four alternative constructions of the development index: principal-component weights, min-max normalisation, rank transformation, and an alpha-optimal two-dimension version. Conversely, the banking performance coefficient is positive and significant across all five constructions and is highest where the index is most internally consistent: 0.324 in the alpha-optimal version compared with 0.065 with equal weights. Aggregation choices that improve measurement therefore strengthen support for H2 and reduce support for H3. The estimators designed for cointegrating regressions—fully modified OLS and dynamic OLS—produce positive and significant interaction coefficients in all three specifications: $+0.145$ ($p < .001$), $+0.124$ ($p = .019$), and $+0.263$ ($p = .003$).

A census of the interaction estimates: The robustness exercises generate a wide range of specifications, and it is more informative to count them than to characterise them vaguely. All estimates are summarised in Table 4. Of the twenty-nine specifications, six produce a significant negative coefficient, eight produce a significant positive coefficient, and fifteen produce a coefficient statistically indistinguishable from zero. The count alone provides limited evidence because the specifications are not independent draws. More important is the structure underlying these results. All negative estimates are based on Chow–Lin or Denton–Cholette-smoothed data and are estimated using the restrictive ARDL (1,0) lag order. The COVID-19 and subsample variations are not independent confirmations; rather, they re-estimate the same specification on subsets of the same smoothed series. All positive estimates result from relaxing one of these two choices: using disaggregation without intra-year smoothing, adopting the richer lag structures selected by both information criteria, or using cointegrating estimators. The sign therefore appears to reflect two modelling decisions rather than a stable feature of the Bahraini economy. Neither decision has a strong empirical justification: the smoothing does not add information, and the selected lag order is the one explicitly rejected by the information criteria.

Table 4. Census of estimates of the interaction coefficient (δ_3)

Group	Specifications	Range of δ_3	Common feature
Significant negative	6	−0.190 to −0.025	Chow-Lin or Denton smoothing with ARDL(1,0)
Significant positive	8	+0.111 to +0.296	Smoothing eliminated, lag order relaxed or cointegrating estimator
Not significant	15	−0.106 to +0.094	Annual data, corrected inference, weaker smoothing, index rebuilt

Note: The negative group includes the reported specification, Denton-Cholette disaggregation, the COVID dummy, 2020 omitted, the pre-2020 subsample and min-max normalisation. The positive group includes step disaggregation, ARDL(2,1), (2,2), (3,2) and (4,2), FMOLS and DOLS with one and two leads and lags. Significance at the 5 per cent level.

Table 5. Summary of hypothesis tests

Hypothesis	Coefficient	p	Survives protocol	Decision
H1: ED → SD (including H1a–H1c)	0.010	0.625	n/a (null)	Not supported
H2: IBP → SD	0.066	0.041	Yes	Supported
H2a: IBP → SD_ECO	0.114	0.303	n/a (null)	Not supported
H2b: IBP → SD_SOC	0.113	0.007	Quarterly only	Supported, channel unknown
H2c: IBP → SD_ENV	0.385	0.000	Partially	Supported, channel unknown
H3: ED × IBP → SD	−0.044	0.006	Sign not identified	Not established

5. Discussion

The rejection of **H1** represents a boundary condition rather than a contradiction of the diversification literature. Structural change theory argues that the gains from development depend on the reallocation of resources towards higher-productivity, export-oriented activities. The Bahrain data demonstrate quantitative sectoral expansion without a corresponding fiscal transformation. Non-oil output averages 82% of GDP, whereas non-oil revenue averages only 28%. The diversification index is also strongly correlated with public debt ($r = .878$). Growth in construction and services supported by public borrowing increases the measured non-oil base but does not necessarily decouple the development path from the oil cycle. The positive oil coefficient in the economic-dimension model ($\beta = 0.399$) indicates that the economic dimension of development responds more strongly to oil prices than to measured diversification, consistent with Espinoza and Senhadji (2011) and Al-Doski and Al-Arkoub (2023). This null result is robust across numerous specifications, frequencies, and disaggregation methods and is therefore the least sensitive to the data restrictions of the study.

The **H2** pattern identifies an association between Islamic banking performance and sustainable development, with an important proviso. At the quarterly frequency, the social effect may operate through channels that are less prominent in conventional banking, including *zakat*, *qard hasan*, microfinance, and housing finance for lower-income households (Asaad & Al-Saad, 2025). The environmental effect is the largest coefficient in the study, consistent with the Central Bank of Bahrain's principles of sustainable finance in 2022 and 2023, and with the findings of Alghafes et al. (2024), who argue that the environmental dimension of ESG requires deliberate strategic effort in GCC Islamic banks. The environmental model also shows a strongly negative oil coefficient ($\beta = -0.286$), which makes the interpretation more pronounced: oil abundance and environmental sustainability appear to move in opposing directions in Bahrain, while Islamic banking performance is positively associated with the environmental indicator. However, the annual estimates place the banking effect on the economic dimension instead. Thus, this dimensional interpretation is supported by the quarterly series but is not established consistently across frequencies. Both frequencies, however, show a positive association in composite form, which is consistent with Otman (2022) and with Avdukic and Asutay (2025) regarding the gap between stated developmental orientation and measured outcomes.

The moderation hypothesis (**H3**) deserves separate consideration. Section 2.3 presented competing theoretical predictions, and the data do not provide a definitive basis for distinguishing between them. The reported specification favours substitution, and five variants of it do so as well. All six share two modelling choices that are problematic on their own terms: interpolation smoothing that adds no information to the ten annual observations and a lag order that performs worst among the twelve specifications according to both information criteria. Relaxing either choice reverses the sign. The specifications supporting amplification are therefore more strongly justified by the model-selection and estimation evidence, representing an asymmetry in the quality of the supporting specifications rather than simply in their number.

The policy implications differ substantially depending on which interpretation is correct, which is why the ambiguity matters. Under the buffering interpretation, a robust Islamic banking industry is a partial substitute for diversification, with the two representing alternative channels of development. Under the amplification interpretation, they are complements: diversification generates development returns to the extent that banks allocate resources towards it, and neither strategy acts alone. The second interpretation is closer to the structural picture documented here—a diversification index correlated at .878 with public debt, non-oil growth concentrated in sectors dependent on government spending, and a banking sector with a capital adequacy ratio of 20.01% but a return on assets of only 0.47%. This may describe an economy diversifying with substantial reliance on borrowed funds while its banks maintain capital that is not being translated into high returns. It is an economy in which the two channels may not yet be effectively connected, which is what a positive but unrealised interaction would depict. The data suggest this interpretation rather than confirm it.

The ambiguity is further compounded by the structural break identified in 2020Q3. Whether the sign reversal across this point represents a regime change following the pandemic and the subsequent supervisory focus on sustainable finance, or the instability that may arise when only five annual observations are divided into two regimes, cannot be determined from the present data. This may be the most important question raised by the analysis. One further methodological implication is that the diversification coefficient is insignificant in Models 1 and 2 but becomes significant when the interaction is introduced. This suggests that studies estimating only direct effects in similar settings may report coefficients that are affected by omitted interaction effects rather than relationships that are genuinely absent.

6. Conclusion

Measured economic diversification had no significant direct effect on development in any dimension over the 2015–2024 period. This is the most robust result of the study, and it holds across all specifications, at both frequencies, and with all disaggregation methods. The main empirical contribution is that Islamic banking performance was favourably associated with sustainable development in its composite form, and this association remains supported across the robustness analyses at both frequencies, although the quarterly and annual estimates differ regarding which dimension underlies the association. The reported specification showed a negative interaction, but this result is not stable: across twenty-nine specifications, it is significantly negative in six, significantly positive in eight, and insignificant in fifteen, with the pattern being systematic. The paper consequently makes no assertion that moderation exists in either direction. If the better-supported specifications point in either direction, they tend towards amplification, which is the opposite of what the reported specification implies.

First, the findings point to a fiscal and institutional constraint rather than a sectoral one. A more relevant policy objective is to address the disparity between an 82% non-oil share of output and a 28% non-oil share of revenue. The oil cycle continues to influence the economic dimension of development through public finance. This points to the revenue side of Economic Vision 2030—the pace of non-oil revenue mobilisation and the treatment of debt-financed non-oil activity in fiscal reporting—rather than to further quantitative expansion of non-oil output.

Second, the developmental return of Islamic banking can potentially be improved through changes in the composition of finance and by making sustainability obligations measurable. In terms of composition, this would involve a shift from short-term consumer products towards *musharakah* and *mudarabah* structures serving productive non-oil sectors. The tools available to the Central Bank of Bahrain include differential capital or liquidity treatment and disclosure rules that make financing composition more transparent. In terms of measurement, the 2022 and 2023 sustainable finance principles provide useful guidelines. Their transformation into reporting requirements incorporating three distinct indicators—green *sukuk* issuance,

ijarah-based renewable energy financing volumes, and the proportion of finance subject to environmental screening—would produce the observable series that are absent from the present analysis.

Third, *Shariah* governance needs to be considered as a development variable in its own right, as it may determine whether *maqasid* principles are incorporated into financing policy or remain primarily declaratory. Data on board composition, jurisdiction over financing choices, and audit scope at the bank level could be related to the developmental profile of each portfolio, helping to address the aggregation problem encountered in the present study.

This study is subject to several limitations. First, the sample size is constrained by the availability of annual data, with only ten observations ($N = 10$) over the study period. This is insufficient to support the dynamic specifications typically employed in this literature and substantially limits the statistical power of the analysis. Accordingly, the inferential results should be interpreted with an effective sample size of ten. From a specification perspective, the unit-root behaviour of the lagged dependent variable cannot be rejected, individual coefficients in Model 3 are imprecisely estimated because of multicollinearity, and the confirmed structural break indicates that full-sample estimates may mask differences in parameter relationships across regimes. Second, the study faces limitations in the measurement of the composite indices. The component series underlying the indices are not fully available; consequently, the indices cannot be completely replicated from publicly published data. This limitation constrains the interpretation of the sustainable development index, particularly its environmental dimension, which is subject to greater measurement uncertainty. Future confirmatory research should therefore reconstruct the indices from their underlying source components using fully documented and reproducible procedures. Where the necessary source data are publicly available, such reconstruction should be feasible.

These limitations point to three priorities for future research. First, the composite indices should be reconstructed using fully documented component-level data and transparent aggregation procedures. Second, a GCC panel framework could provide the cross-sectional variation absent from the current design and enable a more rigorous assessment of whether the observed amplification pattern generalises across Gulf economies. Third, bank-level panel data could incorporate *Shariah* governance variables directly into the analysis and provide greater insight into how governance structures shape the developmental composition of Islamic banking portfolios. Collectively, these extensions would provide a stronger empirical basis for evaluating the relationships examined in the present study. The current findings therefore provide a basis for further investigation and highlight the importance of improved data collection and measurement for future confirmatory research.

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Appendix. Construction of the composite indices

Components are standardised to zero mean and unit variance across the ten annual observations before aggregation; each composite is an equally weighted average of its standardised components. Components marked † are specified in the study design but do not appear in the surviving estimation dataset, so the table documents construction as specified rather than as verified.

Table A1. Component-level documentation

Index / component	Definition	Source	Weight
Economic diversification (ED)			
Non-oil GDP share	Non-oil sectors as % of real GDP	MOFNE / IGA	1/3
Non-oil revenue share	Non-oil revenue as % of total government revenue	MOFNE	1/3
Manufacturing share	Manufacturing value added as % of GDP	IGA / World Bank	1/3
Sustainable development (SD)			
Economic dimension †	Non-oil real growth; macroeconomic stability measures	MOFNE / IMF	1/3
Social dimension	Human Development Index; public spending on education and health	UNDP / MOFNE	1/3
Environmental dimension †	Environmental expenditure; energy efficiency indicators	IGA / World Bank	1/3
Islamic banks' performance (IBP)			
Return on assets; return on equity	Sector-aggregate net income over assets and over equity (%)	CBB; bank reports	1/4 each
Capital adequacy ratio	Regulatory capital over risk-weighted assets (%)	CBB	1/4
Non-performing financing	Non-performing over total facilities (%), reverse-coded	CBB	1/4
Developmental and sustainability dimensions †	Industrial and SME financing shares; environmental and social project financing; financial inclusion	CBB; bank reports	not in dataset

Note: MOFNE = Ministry of Finance and National Economy; IGA = Information and eGovernment Authority; CBB = Central Bank of Bahrain. The three development dimensions have standard deviations of 0.81, 0.39 and 0.79 rather than 1.00, the signature of averaging several standardised components rather than a single series, which is consistent with the specification above but does not verify it.



Key Factors Driving Retail Investors to Embrace Islamic FinTech-SOTS (Shariah Online Trading System) in the Indonesian Islamic Capital Market

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Abstract

Introduced in 2011, the Shariah Online Trading System (SOTS) is an Islamic FinTech platform certified by the National Shariah Board (DSN-MUI) to facilitate retail investment in the Indonesian Islamic capital market. Despite an absolute increase in SOTS users from 85,891 in 2020 to 217,157 in 2025, the platform's market share relative to the rapidly expanding retail investor population declined from 5.1% to 2.9%. This paradoxical denominator effect highlights the need to understand the behavioural and contextual antecedents of adoption intention rather than merely tracking realised market share. Drawing on an extended Technology Acceptance Model (TAM), this study investigates the determinants of retail investors' intention to adopt SOTS. Specifically, it examines perceived usefulness, perceived ease of use, government support, user innovativeness, religiosity, and Islamic financial literacy as antecedents of attitude, while conceptualising perceived trust as a mediator between attitude and behavioural intention. Data were collected via purposive online sampling, yielding 596 valid responses from both current and prospective retail investors across the Indonesian financial sector. Partial Least Squares Structural Equation Modelling (PLS-SEM) reveals that perceived ease of use, user innovativeness, religiosity, and Islamic financial literacy significantly and positively influence attitude, whereas government support and perceived usefulness have non-significant effects. Furthermore, attitude exerts a robust direct effect on adoption intention ($\beta = 0.696$) and a significant indirect effect through perceived trust ($\beta = 0.153$), with a variance accounted for (VAF) of 18.0% indicating complementary partial mediation. These findings extend TAM literature within the Islamic capital market by highlighting the importance of domain-specific factors, particularly religiosity and Islamic financial literacy, and user-centric innovativeness alongside traditional TAM constructs. Practically, this study offers actionable insights for policymakers, regulators, and platform developers seeking to strengthen SOTS adoption and broaden retail participation in the Islamic capital market.

Keywords: Islamic Capital Market, Islamic FinTech, Prospective Retail Investors, Retail Investors, Shariah Online Trading System

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1. Introduction

1.1 Background

The Islamic capital market has emerged as an important component of the global Islamic financial system by providing investment instruments structured in accordance with *Shariah* principles (Haron & Adeyemi, 2016; Obaidullah, 2005). Indonesia, home to the world's largest Muslim population, represents a strategic market for the continued development of Islamic finance. As of December 2025, Muslims accounted for approximately

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87.15% of Indonesia's 288.31 million population (Ministry of Home Affairs, 2025). This demographic profile reinforces Indonesia's potential to strengthen its position in the global Islamic economy, finance, and *halal* industry, supported by government initiatives and national development programmes. Nevertheless, a large Muslim population does not, by itself, translate into the adoption of specialised Islamic investment technologies. Understanding such adoption therefore requires attention to the functional, institutional, personal, and Islamic-specific factors that shape users' attitudes and intentions towards *Shariah*-compliant digital investment platforms. Indonesia's Islamic financial sector has developed within a distinctive institutional and market environment. It is characterised by a predominantly retail-oriented market structure involving multiple institutions and regulatory arrangements (Judijanto et al., 2024; Menne et al., 2023; Muslim, 2023; Setiawan, 2023). Despite these structural complexities, the sector has expanded steadily. According to the Financial Services Authority (OJK, 2025), Islamic financial assets accounted for 7.69% of the banking sector, 19.54% of the capital market, and 4.62% of the non-bank financial sector in 2025. These developments indicate the growing relevance of Islamic financial intermediation and investment in Indonesia. At the same time, rapid digital transformation has reshaped the delivery of financial services by increasing accessibility, convenience, and transactional efficiency, thereby creating new opportunities for the expansion of Islamic FinTech.

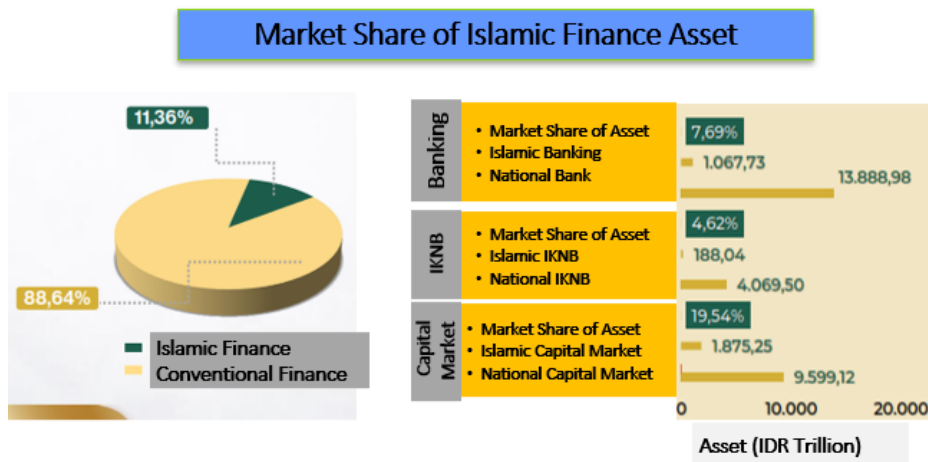


Figure 1. Indonesian Islamic Finance Industry Market Share

Source: OJK (2025)

The adoption of financial technology (FinTech) has accelerated digital investment activities within Indonesia's Islamic capital market. To support *Shariah*-compliant investing, the Indonesia Stock Exchange (IDX) introduced the *Shariah* Online Trading System (SOTS) in 2011, which was recognised as the first Islamic FinTech platform to integrate DSN-MUI fatwas into an online trading system (Abdalloh, 2020). SOTS enables retail investors to trade *Shariah*-compliant securities while automatically preventing transactions involving non-compliant stocks, margin trading, and short selling, thereby ensuring adherence to Islamic principles and promoting ethical investment practices.

The number of *Shariah* retail investors (SOTS users) increased from 85,891 in 2020 to 217,157 in 2025 (an increase of approximately 2.5 times). Meanwhile, the total retail investor population expanded at a much faster rate, increasing approximately 4.46-fold, representing a 345.7% increase, from 1,695,268 in 2020 to 7,556,287 in 2025, as shown in Figure 2. Consequently, the SOTS share fell from 5.1% to 2.9%. This pattern represents a denominator effect: absolute SOTS participation grew, but total retail investor onboarding outpaced it. This trend establishes the practical need to understand intention formation among current and prospective investors. The share of SOTS users remains below the Indonesia Stock Exchange (IDX) target of at least 10% of total retail investors (IDX, 2020). Unlike a generic efficiency-enhancing FinTech application, SOTS operates as a constrained technology: it deliberately excludes non-*Shariah*-compliant securities, margin financing, and short

selling. While these restrictions provide compliance assurance, they may also create a perceived sacrifice for return-seeking investors already using conventional platforms. This dual character makes SOTS a theoretically informative context for testing whether the standard TAM emphasis on usefulness is complemented or displaced by perceived ease of use, Islamic financial literacy, religiosity, and trust.



Figure 2. All Retail Investors (2020 - 2025) and Shariah Retail Investors (SOTS User) (2012 - 2025)
Source: Summarized from IDX and Indonesia Central Securities Custody (KSEI) (2025)

Previous research in Islamic finance has primarily focused on Islamic banking, digital payment systems, crowdfunding, and peer-to-peer (P2P) financing (Nurfadilah & Samidi, 2021; Rabbani et al., 2020; Shaikh et al., 2017). Studies focusing on the Islamic capital market have largely examined regulatory implementation, DSN-MUI Fatwa No. 80/2011, general investor behaviour, digital financial literacy, Islamic philanthropy, religiosity, government initiatives, and firm performance (Asutay et al., 2023; Dika & Kassim, 2021; Pinasti et al., 2022; Selasi et al., 2022; Usman et al., 2024). Furthermore, empirical literature indicates that attitude, perceived behavioural control, religiosity, and Islamic financial literacy significantly influence investors' intention to invest in the Islamic capital market (Septyanto et al., 2021; Yusufiarto et al., 2023).

The novelty of this study is contextual and mechanism-oriented rather than based on a claim to develop a novel adoption theory. While previous Islamic FinTech studies have investigated banking, payments, P2P financing, and philanthropy, SOTS represents a specialised capital-market execution system whose *Shariah* constraints deliberately restrict specific trading options. This study therefore examines whether a values-based, restricted-choice platform produces a distinct pattern of relationships within TAM. Additionally, it distinguishes the direct attitude–intention pathway from the indirect pathway mediated through perceived trust. The analytical boundaries of this study are explicit: it investigates current and prospective retail investors' reported attitudes and behavioural intentions, rather than realised account opening, trading frequency, or long-term portfolio retention.

2. Literature Review

2.1 FinTech and Islamic FinTech

Financial technology (FinTech) refers to the application of technological innovation to improve the delivery of financial products and services through new business models, processes, and applications (Financial Stability Board [FSB], 2022; Irum Saba et al., 2019; Schueffel, 2016). Since the 1990s, electronic trading, internet technologies, and digital commerce have enhanced the efficiency, accessibility, and transparency of financial services. Islamic FinTech extends this concept by integrating financial innovation with *Shariah* principles, requiring financial products, services, and operational processes to avoid *riba* (usury), *gharar* (excessive uncertainty), and *maysir* (gambling), while supporting ethical and socially responsible finance (Hudaefi, 2020).

Islamic FinTech provides technology-enabled financial products and services that comply with Islamic law, promote the higher objectives of *Shariah* (*Maqashid al-Shariah*), and adhere to relevant *fatwas* and institutional regulatory frameworks (Hudaefi, 2020). Beyond enhancing financial inclusion, Islamic FinTech supports ethical, transparent, and socially responsible financial practices consistent with Islamic values (Putri & Thayib, 2025).

2.2 Islamic FinTech Platform: SOTS

SOTS is a specialised Islamic FinTech platform for *Shariah*-compliant online trading developed by the Indonesia Stock Exchange (IDX) and implemented by licensed exchange members (securities brokerages) to facilitate *Shariah*-compliant securities transactions. Its operational parameters are anchored in DSN-MUI *fatwas* and certified by the DSN-MUI to ensure compliance with Islamic principles. This certification embeds *Shariah* controls directly into the execution process: the platform restricts transactions exclusively to eligible securities listed in the List of Islamic Securities (*Daftar Efek Syariah* [DES]) and automatically blocks non-compliant practices, such as margin trading and short selling. SOTS is therefore not merely a conventional platform with a *Shariah* label; its design simultaneously offers compliance assurance while narrowing the available trading set. This creates an inherent structural tension between religious alignment, operational usability, and perceived sacrifice for return-seeking investors. SOTS was introduced to strengthen public confidence in the Islamic capital market while providing retail investors with a secure, transparent, and accessible gateway for *Shariah*-compliant investment (Pinasti et al., 2022; Sari et al., 2018). As of 2025, 18 exchange members actively provide SOTS services, whereas two former providers have not renewed their certifications. The complete list of active SOTS providers is presented in Table 1.

Table 1. 18 Active Exchange Members Providing Shariah Online Trading Systems

No	SOTS Name	Certified by DSN MUI	Exchange Member (AB SOTS)	Website
1.	IPOT Syariah	2011	PT. Indo Premier Sekuritas	www.indopremier.com
2.	HOTS	2012	PT. Mirae Asset Sekuritas Indonesia	www.miraeasset.co.id
3.	BIONS Syariah	2012	PT. BNI Sekuritas	www.bnisekuritas.co.id
4.	MOST Syariah	2012	PT. Mandiri Sekuritas	www.most.co.id
5.	POST Syariah	2012	PT. Panin Sekuritas Tbk.	www.pans.co.id
6.	PROFITS Syariah	2013	PT. Phintraco Sekuritas	www.profits.co.id
7.	FAST Syariah	2015	PT. FAC Sekuritas Indonesia	www.facsekuritas.co.id
8.	MotionTrade Syariah	2016	PT. MNC Sekuritas	www.mncsekuritas.id
9.	HPX Syariah	2016	PT. Henan Putihrai Sekuritas	https://hpsekuritas.id
10.	POEMS Syariah	2016	PT. Philip Sekuritas Indonesia	www.poems.co.id
11.	RHB Tradesmart Syariah	2018	PT. RHB Sekuritas Indonesia	https://rhbtradesmart.co.id/
12.	STAR Syariah	2019	PT. Samuel Sekuritas Indonesia	https://samuel.co.id/
13.	Maybank Trade Syariah	2019	PT. Maybank Sekuritas Indonesia	https://www.maybank-ke.co.id/
14.	BRIGHTS Syariah	2020	PT. BRI Danareksa Sekuritas	https://www.brights.id/
15.	CGS iTrade Syariah	2021	PT. CGS International Sekuritas Indonesia	https://www.cgsi.co.id
16.	KOINS SYARIAH	2022	PT. Korea Investment and Sekuritas Indonesia	https://kisi.co.id/

No	SOTS Name	Certified by DSN MUI	Exchange Member (AB SOTS)	Website
17.	ProClick Syariah	2023	PT. Profindo Sekuritas Indonesia	https://www.profindo.com/
18.	NAIK Syariah	2024	PT. NH Korindo Sekuritas Indonesia	https://www.nhis.co.id/

Source: Author(s) Own. Modified from [IDX \(2025\)](#).

2.3 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) explains individuals' acceptance of technology primarily through two cognitive beliefs: perceived usefulness (PU) and perceived ease of use (PEOU), which jointly determine an individual's attitude towards using a technology and subsequent behavioural intention to adopt it ([Davis, 1989](#); [Davis et al., 1989](#)). TAM is adopted as the foundational theoretical baseline in this study because the core research question concerns individual evaluations of a defined digital trading interface, and because its parsimonious structure enables a direct empirical examination of the unexpected PU–PEOU relationship. While alternative frameworks exist—such as the Unified Theory of Acceptance and Use of Technology (UTAUT/UTAUT2), which foregrounds social influence and facilitating conditions; the Theory of Planned Behaviour (TPB), which incorporates subjective norms and perceived behavioural control; and Innovation Diffusion Theory (IDT), which emphasises broader innovation characteristics—TAM remains the most suitable baseline. These alternatives offer legitimate perspectives; however, the present research design specifically seeks to evaluate whether Islamic-specific factors (religiosity and Islamic financial literacy) and user-centric variables (government support and user innovativeness), together with perceived trust as a mediating mechanism, complement or modify the classic TAM attitude-to-intention mechanism in a *Shariah*-constrained digital environment.

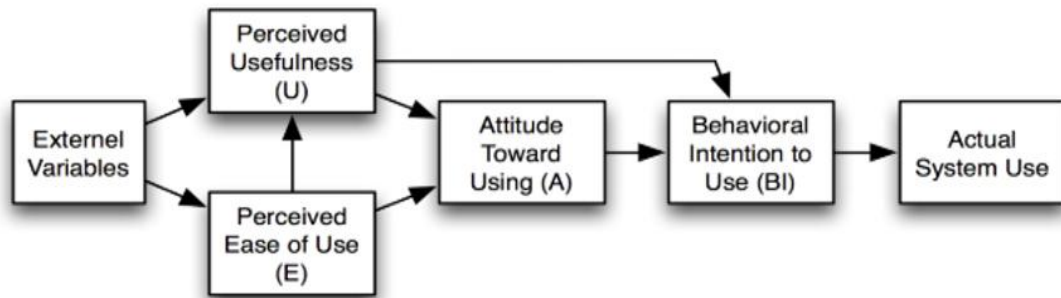


Figure 3. Theoretical Framework of TAM

Source: [Davis et al., \(1989\)](#)

TAM has also faced criticism for accumulating contextual extensions without adequately clarifying the exact underlying mechanisms that link cognitive beliefs, behavioral intentions, and actual system usage ([Bagozzi, 2007](#); [Benbasat & Barki, 2007](#)). This theoretical limitation is particularly salient in retail investment contexts, where an expressed adoption intention does not guarantee formal account opening, active capital deployment, or long-term platform retention. Status quo bias, switching costs, and the well-documented intention–behaviour gap may prevent retail investors who currently utilize conventional online trading platforms from fully transitioning to SOTS. Indeed, the descriptive finding that 44.6% of respondents concurrently engage with both Islamic and conventional capital markets supports the presence of portfolio coexistence rather than complete technology substitution.

Consequently, SOTS provides a compelling empirical and theoretical boundary condition for TAM. Explicit platform restrictions—such as the prohibition of margin trading, short selling, and non-*Shariah*-compliant equities—may diminish perceived investment choice or relative financial utility, even as they enhance religious legitimacy and systemic trust. Under these conditions, PU does not necessarily dominate PEOU, as is typically observed in unconstrained, efficiency-enhancing technologies. Instead, the model posits that operational usability, personal innovativeness, religiosity, and Islamic financial literacy play a pivotal role

in shaping favorable attitudes when generic utility is difficult to differentiate from that of conventional trading interfaces.

Within the broader FinTech literature, scholars have extensively extended TAM by integrating key external construct domains—including perceived trust, user innovativeness, perceived risk, government support, and self-efficacy—to capture adoption dynamics in complex financial environments (Gbongli et al., 2019; Ichwan & Kasri, 2019; Nurfadilah & Samidi, 2021). These extensions confirm that TAM offers a flexible and robust baseline for evaluating digital financial innovation. Given that SOTS operates at the intersection of technological interface and religious compliance, TAM serves as an appropriate foundation for investigating retail investors' adoption behavior in the Indonesian Islamic capital market (Chang et al., 2016; Darmansyah et al., 2021; Hu et al., 2019; Huei et al., 2018; Maniam, 2024; Pulungan et al., 2024; Shaikh et al., 2020; Venkatesh & Davis, 2000).

3. Conceptual Framework and Hypothesis Development

Previous empirical studies have extensively applied the Technology Acceptance Model (TAM) to explain FinTech adoption, drawing on core determinants such as perceived ease of use, perceived usefulness, perceived trust, religiosity, attitude, subjective norms, and behavioural intention (Ichwan & Kasri, 2019; Shaikh et al., 2020; Usman et al., 2020). However, empirical findings remain inconsistent across different operational contexts and geographical markets, indicating that the explanatory power of TAM largely depends on the specific external constructs integrated into the framework. In particular, the institutional role of government support in driving Islamic FinTech adoption within capital markets has received limited empirical attention (Al Nawayseh, 2020).

To address this gap, the present study extends TAM by incorporating government support, user innovativeness, religiosity, Islamic financial literacy, and perceived trust to examine retail investors' intention to adopt SOTS. Furthermore, this study contributes to the empirical literature by testing the mediating role of perceived trust in the structural relationship between attitude towards using SOTS and behavioural intention to adopt SOTS.

Based on the proposed conceptual framework, this study formulates ten hypotheses (H1 through H10) to investigate the direct, indirect, and mediating relationships underlying retail investors' intention to adopt SOTS. The underlying structural relationships are illustrated in Figure 4.

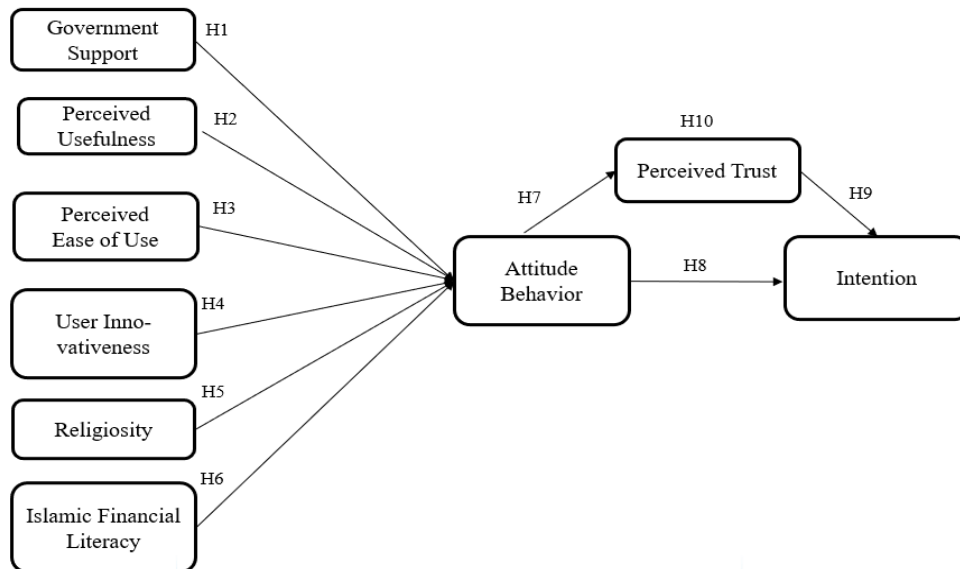


Figure 4. Conceptual Framework- Modified TAM-Retail Investors' Intention to Embrace SOTS

3.1 Government Support (GS)

Government support refers to policies, regulations, infrastructure, and incentives provided by public authorities

to facilitate technology adoption. Previous studies demonstrate that active government intervention enhances users' perceptions of technology usefulness, systemic trust, and overall adoption intentions (Garcia & Mohnen, 2010). Government support also strengthens public confidence in digital financial services and fosters an enabling environment for innovation (Marakarkandy et al., 2017). In the Islamic FinTech domain, supportive regulatory frameworks and national infrastructure are expected to enhance investors' confidence in *Shariah*-compliant platforms. Accordingly, the following hypothesis is formulated:

H1: Government support positively and significantly influences attitude towards using SOTS.

3.2 Perceived Usefulness (PU)

Perceived usefulness is defined as the degree to which a user believes that using a specific technology will enhance their job performance or decision-making efficiency (Davis, 1989). Empirical literature consistently confirms that perceived usefulness positively drives user attitudes and behavioural intentions towards technology adoption (Adams et al., 1992; Featherman & Pavlou, 2003; Hakim & Supriyanto, 2024; Hu et al., 2019). FinTech research further indicates that investors are significantly more likely to adopt digital financial platforms when they perceive tangible financial benefits and enhanced analytical capabilities (Maniam, 2024). Thus, the following hypothesis is proposed:

H2: Perceived usefulness positively and significantly influences attitude towards using SOTS.

3.3 Perceived Ease of Use (PEOU)

Perceived ease of use reflects the extent to which an individual believes that operating a particular system will be free of effort (Davis, 1989; Davis et al., 1989). User-friendly technologies diminish cognitive friction and elevate positive evaluations of utility. Empirical studies consistently demonstrate that perceived ease of use directly influences user attitudes towards FinTech adoption (Hakim et al., 2024; Robbana et al., 2025). Therefore, the following hypothesis is formulated:

H3: Perceived ease of use positively and significantly influences attitude towards using SOTS.

3.4 User Innovativeness (UI)

User innovativeness captures an individual's personal propensity and willingness to experiment with and adopt emerging technological solutions (Leicht et al., 2018). Innovative users typically act as early adopters and display more receptive attitudes towards technological novelties. Studies investigating mobile banking and FinTech adoption consistently show that personal innovativeness positively determines user attitudes (Jafri et al., 2024; Kim et al., 2010). Consequently, the following hypothesis is proposed:

H4: User innovativeness positively and significantly influences attitude towards using SOTS.

3.5 Religiosity (R)

Religiosity refers to the extent to which an individual adheres to religious principles and allows those beliefs to guide their attitudes and decisions (Huber, 2012). In Islamic finance, highly religious individuals exhibit a strong preference for *Shariah*-compliant financial instruments while actively avoiding prohibited financial elements such as interest (*riba*) and uncertainty (*gharar*) (Mansour & Jlassi, 2014; Tahir & Danarsari, 2023). Numerous studies report a positive relationship between religiosity and Islamic FinTech adoption (Majid, 2021; Usman et al., 2020), although some empirical evidence suggests mixed outcomes due to competing market factors (Asutay et al., 2023). Thus, the following hypothesis is formulated:

H5: Religiosity positively and significantly influences attitude towards using SOTS.

3.6 Islamic Financial Literacy (IFL)

Islamic financial literacy encompasses an individual's knowledge and operational understanding of Islamic financial principles, enabling informed decision-making regarding *Shariah*-compliant products (Abdullah & Anderson, 2015). Empirical studies demonstrate that higher levels of Islamic financial literacy significantly increase user preferences for Islamic financial intermediation and capital market participation (Lajuni et al.,

2020). Financially literate investors possess a greater capacity to appreciate the value proposition of specialized Islamic financial technologies (Ibrahim et al., 2024). Therefore, the following hypothesis is proposed:

H6: Islamic financial literacy positively and significantly influences attitude towards using SOTS.

3.7 Attitude Towards Using (ATT)

Attitude towards using reflects an individual's overall evaluative judgment—favourable or unfavourable—regarding the adoption of a specific technological platform (Ajzen, 1991; Davis, 1989). TAM literature firmly establishes that a positive attitude directly increases behavioural intention to adopt (Gupta & Arora, 2017; Shaikh et al., 2015). Empirical studies in Islamic FinTech similarly confirm that favourable user attitudes strongly drive usage intentions (Darmansyah et al., 2020; Kasri & Chaerunnisa, 2020). Furthermore, a favourable attitude enhances systemic confidence and institutional trust. Accordingly, the following hypotheses are formulated:

H7: Attitude towards using SOTS positively and significantly influences perceived trust.

H8: Attitude towards using SOTS positively and significantly influences behavioural intention to adopt SOTS.

3.8 Perceived Trust (PT)

Perceived trust refers to a user's confidence in the reliability, security, integrity, and operational fairness of a digital platform (Hu et al., 2019). Trust mitigates perceived risk and transactional uncertainty, thereby acting as a crucial prerequisite for financial technology adoption (Hanafizadeh et al., 2014). In the context of Islamic FinTech, trust encompasses both technical security and structural assurance of *Shariah* compliance (Almaiah et al., 2020; Haron et al., 2020). Beyond its direct impact on intention, perceived trust serves as a crucial underlying mechanism through which favorable cognitive attitudes translate into actionable usage intentions. Hence, the following hypotheses are proposed:

H9: Perceived trust positively and significantly influences behavioural intention to adopt SOTS.

H10: Perceived trust mediates the positive relationship between attitude towards using SOTS and behavioural intention to adopt SOTS.

4. Research Method

A cross-sectional quantitative design was used to examine associations among the study constructs. Data were collected through an online survey and analysed using partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4. This prediction-oriented design is appropriate for estimating a model with nine latent constructs and multiple direct and indirect paths; however, it does not establish temporal causality or realised technology adoption. Prior to full deployment, a pilot test was conducted with 30 retail investors possessing expertise in the Islamic capital market and finance, including practitioners, academics, regulators, and members of the National Shariah Board–Indonesian Ulema Council (DSN-MUI). Criterion-based purposive sampling was employed to select respondents with current exposure to financial products or an expressed interest in capital-market investment (Memon et al., 2025). The eligible population comprised current investors across capital markets, banking, non-bank financial institutions, cryptoassets, and digital gold, as well as prospective capital-market participants. Sample adequacy was evaluated for the most complex endogenous structural equation, which contains six direct predictors. An *a priori* multiple regression power calculation ($\alpha = .05$, $1 - \beta = .80$, six predictors) indicated that a minimum of 279 observations was required to detect a small effect size ($f^2 = .05$). The realised sample size of $n = 596$ comfortably exceeds this benchmark (Cohen, 1988; Memon et al., 2020), replacing older population-proportion rules such as Krejcie and Morgan (1970) as the primary sampling justification. Of the 657 submitted questionnaires, 596 satisfied all screening criteria and completeness checks, yielding an analytical indicator matrix with zero missing values.

Primary data were collected from February 2024 to December 2025 using a structured online instrument distributed through investment community networks, Islamic capital-market study groups, webinars, and relevant professional channels. The bilingual instrument provided equivalent versions in English and Bahasa Indonesia. The questionnaire was structured into three primary parts: screening questions; demographic profiles

and platform preferences; and measurement items covering six exogenous constructs (government support, perceived usefulness, perceived ease of use, user innovativeness, religiosity, and Islamic financial literacy) and three endogenous constructs (attitude towards using, perceived trust, and behavioural intention to adopt). All latent variables were operationalised using a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Every construct was specified as reflective, as the indicator items capture realisations of the underlying latent perceptions and were expected to covary. The detailed operationalisation and complete 50-item measurement scale are presented in Table 2.

Table 2. Measurement Constructs and Questionnaire Items

Construct	Code	Measurement Item	Adapted from
Government Support (GS)	GS1	The government provides infrastructure to support the use of the Islamic FinTech Platform-SOTS in the Indonesian Islamic Capital Market.	Hu et al. (2019); Marakarkandy et al. (2017); Nurfadilah and Samidi (2021)
	GS2	The government has established regulations supporting the implementation of the Islamic FinTech Platform-SOTS in the Indonesian Islamic Capital Market.	
	GS3	Government support encourages the adoption of the Islamic FinTech Platform-SOTS.	
	GS4	The government collaborates with SROs (IDX, KSEI, KPEI), DSN-MUI, and exchange members to enhance Islamic financial literacy and awareness of the Islamic FinTech Platform-SOTS.	
	GS5	The government provides educational programmes and media campaigns promoting the Islamic FinTech Platform-SOTS.	
	GS6	The government collaborates with DSN-MUI in developing and implementing Shariah principles for the Islamic capital market and Islamic FinTech.	
Perceived Usefulness (PU)	PU1	The Islamic FinTech Platform-SOTS meets my investment needs.	Fedorko et al. (2018); Hu et al. (2019); Lockett and Littler (1997); Huh et al. (2009); Nurfadilah and Samidi (2021)
	PU2	Using the Islamic FinTech Platform-SOTS reduces transaction costs.	
	PU3	The platform improves transaction efficiency.	
	PU4	The platform facilitates the management of my financial and investment activities.	
	PU5	The platform enhances access to the Islamic capital market.	

Construct	Code	Measurement Item	Adapted from
	PU6	The platform contributes to market deepening.	
	PU7	The platform improves my Islamic financial literacy.	
	PU8	I prefer the platform to integrate Islamic stocks with Islamic ETFs, REITs, Sukuk, Islamic mutual funds, and other Islamic investment products.	
	PU9	I prefer the platform to provide digital financial literacy, financial planning, E-IPO, Islamic equity crowdfunding, and robo-advisory services.	
	PU10	I prefer the platform to include Islamic philanthropic services such as Stock Zakat, Stock Waqf, and Stock Sadaqah.	
Perceived Ease of Use (PEOU)	PEOU1	The Islamic FinTech Platform-SOTS is user-friendly and easy to understand.	Hu et al. (2019); Wang et al. (2003); Zandhessami and Geranmayeh (2014); Nurfadilah and Samidi (2021)
	PEOU2	The platform is easy to use across applications, desktop, and web interfaces.	
	PEOU3	The platform is easy to operate.	
	PEOU4	Using the platform requires minimal effort.	
	PEOU5	The platform is regularly updated to meet retail investors' needs.	
Perceived Trust (PT)	PT1	Exchange members managing the Islamic FinTech Platform-SOTS are honest and fulfill their obligations.	Usman et al. (2020); Haron et al. (2020) Nurfadilah and Samidi (2021)
	PT2	The platform provides adequate privacy and security protection.	
	PT3	The information provided by the platform is reliable.	
	PT4	The services and features offered meet my investment needs.	
	PT5	The platform operates with integrity and complies with Shariah principles.	
User Innovativeness (UI)	UI1	Compared with my peers, I am among the first to try new technologies.	Turan et al. (2015); Nurfadilah and Samidi (2021)
	UI2	I enjoy exploring new technologies.	
	UI3	I actively seek information about new technologies.	

Construct	Code	Measurement Item	Adapted from
Religiosity (R)	UI4	I have high expectations regarding the performance of new technologies.	Usman et al. (2020); Majid (2021)
	UI5	I adapt easily to new technologies.	
	R1	It is important that the Islamic FinTech Platform-SOTS is certified by DSN-MUI.	
	R2	I seek knowledge regarding Islamic perspectives on investing through the Islamic FinTech Platform-SOTS.	
	R3	I believe investing through the Islamic FinTech Platform-SOTS is permissible under Shariah.	
Islamic Financial Literacy (IFL)	R4	I only intend to invest through Islamic FinTech platforms certified by DSN-MUI.	Kasri et al.(2022); Dinc et al. (2021); Nugroho and Apriliana (2022); Fauzah and Amaliyah (2023)
	R5	To invest in the Indonesian Islamic capital market, I will choose Islamic FinTech certified as Shariah-compliant by DSN-MUI.	
	IFL1	I understand Shariah investment principles in the Islamic capital market.	
	IFL2	I understand Shariah contracts, products, and services in the Islamic capital market.	
	IFL3	I am familiar with the Islamic FinTech Platform-SOTS.	
Attitude Behaviour (AB)	IFL4	I know that the Islamic FinTech Platform-SOTS must be certified by DSN-MUI.	Hu et al. (2019); Grabner-Kräuter and Faullant. (2008); Nurfadilah and Samidi (2021)
	IFL5	I know that conventional online investment platforms (e.g., Bareksa, Bibit, and Ajaib) are not certified by DSN-MUI.	
	AB1	I have had positive experiences using the Islamic FinTech Platform-SOTS.	
	AB2	I am interested in using the Islamic FinTech Platform-SOTS.	
	AB3	I believe using the platform is a good idea.	
Intention to Use (ITU)	AB4	I like receiving updates from exchange members offering the Islamic FinTech Platform-SOTS.	Hu et al. (2019); Nurfadilah and Samidi (2021)
	ITU1	If I have used the Islamic FinTech Platform-SOTS, I intend to continue using it.	

Construct	Code	Measurement Item	Adapted from
	ITU2	I will recommend the Islamic FinTech Platform-SOTS to others.	
	ITU3	I intend to use the platform frequently in the future.	
	ITU4	I currently intend to use the Islamic FinTech Platform-SOTS.	
	ITU5	I intend to use the platform to facilitate investment in the Islamic capital market.	

5. Empirical Results and Discussion

5.1 Descriptive Analysis

5.1.1 Profile of the Respondents

The 596 respondents were predominantly young and comprised a substantial proportion of students: 71.1% were aged 15–25 years, 61.6% were students, and 90.0% resided on the island of Java. The sample is therefore more representative of digitally reachable, young, Java-based current and prospective retail investors than of the Indonesian retail investor population as a whole. Regarding religious affiliation, 92.3% of respondents identified as Muslim and 7.7% as non-Muslim, providing variation in religious affiliation within the analytical sample. In terms of general FinTech experience, 53.2% of respondents had used a digital financial platform for less than six months, whereas 12.6% had not yet used one. A complete breakdown of respondent demographic characteristics and investment experience is presented in Table 3.

Table 3. Respondent Demography Profile

No.	Variables	Characteristics	Total	%
1.	Gender	Male	367	61.6%
		Female	229	38.4%
2.	Age	15-19	173	29.0%
		20 – 25	251	42.1%
		26 - 30	48	8.1%
		31 – 40	76	12.8%
		41-50	40	6.7%
		> 50	8	1.3%
3.	Religion	Muslim	550	92.3%
		Non-Muslim	46	7.7%
4.	Last education	Senior high school	315	52.9%
		Diploma	22	3.7%
		Bachelor	194	32.6%
		Master	56	9.4%
		Doctor	9	1.5%
5.	Occupation/Activities	Student.	363	60.9%
		Private Employee.	179	30.0%
		Academics/Lecturer	24	4.0%
		Entrepreneur	12	2.0%
		Civil Servant (ASN)	7	1.2%
		Freelancer/No formal work/Jobless/unemployed	6	1.0%
		SOE/BUMN Employee	4	0.7%
		Housewife	1	0.2%
6.	Domicile in Indonesia	JaBoDeTaBek	142	23.8%

		Java (Java Non-JaBoDeTaBek)	394	66.1%
		Kalimantan	14	2.3%
		Maluku and Papua	2	0.3%
		Sulawesi	4	0.7%
		Sumatra	35	5.9%
		Bali, NTT and NTB	5	0.8%
7.	Duration of FinTech Platform usage	< 6 months	317	53.2%
		6 months - 1 year	80	13.4%
		1 year - 2 years	58	9.7%
		> 2 years	66	11.1%
		Not yet at all	75	12.6%

5.1.2 Screening Respondents and Investment Participation

Table 4 presents respondents' participation across various financial platforms and products in Indonesia. Of the 596 respondents, 152 (25.5%) were active capital-market investors, while 162 (27.2%) utilised Islamic or conventional banking products, including fixed deposits, *mudharabah*-based savings accounts, and current accounts. Only 37 respondents (6.2%) participated in non-bank financial products, such as unit-linked insurance and FinTech peer-to-peer (P2P) financing. Participation in alternative digital assets was minimal, involving two respondents (0.3%) in cryptocurrencies and one respondent (0.2%) in digital gold. Notably, 242 respondents (40.6%) were prospective capital-market investors, indicating considerable potential for future market participation. These sample characteristics support positioning the study around adoption intention while limiting empirical claims regarding highly experienced SOTS users, realised transactional frequency, and long-term user retention.

Table 4: Screening Respondent Results

No.	I am a retail investor (individual investor) in:	Number	%
1.	Capital Market	152	25.5%
2.	Banking (Time Deposit (Conventional) or Islamic Current Account (CA)/Saving Account (SA)/Time Deposit (TD) based on Mudharabah)	162	27.2%
3.	Non-Banking (Unit Link, FinTech P2P Lending/Financing, etc)	37	6.2%
4.	Crypto Market	2	0.3%
5.	Digital Gold	1	0.2%
6.	Prospective Retail Investor in Capital Market	242	40.6%
	Total	596	100.0%

5.1.3 Preference for Capital Market Type

This study also examined respondents' preferences regarding capital-market type. As shown in Table 5, the largest proportion of respondents (44.6%, $n = 266$) preferred investing in both Islamic and conventional capital markets, suggesting a substantial prevalence of portfolio coexistence. Meanwhile, 37.4% ($n = 223$) preferred investing exclusively in the Islamic capital market, while 17.4% ($n = 104$) preferred investing exclusively in the conventional capital market. Only 0.5% ($n = 3$) did not provide a response, representing a negligible proportion of the sample.

Table 5: The Preference for Capital Market Type

No	The Preference for Capital Market Type	Number	%
1.	Both Islamic and conventional capital markets	266	44.6%
2.	Conventional capital market (only)	104	17.4%

No	The Preference for Capital Market Type	Number	%
3.	Islamic capital market (only)	223	37.4%
4.	No responses	3	0.5%
Total		596	100.0%

The finding that 44.6% of respondents invest in both Islamic and conventional markets suggests substantial portfolio coexistence. Rather than serving solely as a substitute for conventional finance, Islamic finance may increasingly be viewed as a complementary investment option within a diversified portfolio (Masih et al., 2018; Panjwani & Shili, 2020).

5.1.4 Preference for SOTS Usage

This study also examined respondents' preferences regarding specific SOTS platforms offered by exchange members in Indonesia. As reported in Table 6, IPOT Syariah was the most frequently selected platform ($n = 74$, 12.4%), followed by BIONS ($n = 45$, 7.6%) and MOST Syariah ($n = 26$, 4.4%). Other certified platforms recorded lower selection rates, suggesting that recognised brands and institutionally backed platforms have greater visibility within the SOTS landscape. Notably, 370 respondents (62.1%) indicated that they had not yet adopted any SOTS platform. This finding reflects limited SOTS penetration within the sample rather than market fragmentation or reliance on unlisted providers. Existing empirical literature suggests that SOTS adoption is associated with *Shariah* certification integrity, platform usability, technological features, institutional reputation, and investors' financial literacy and awareness (Nugroho & Wibowo, 2021; Rahman et al., 2023). These empirical patterns highlight potential opportunities to expand SOTS adoption through targeted investor education, institutional partnerships, mobile interface optimisation, and enhanced digital features, such as automated *Shariah*-compliant stock screening and robo-advisory tools. Regulators can support this development by strengthening platform standards and financial-literacy initiatives, while brokerage firms can focus on user experience, platform security, and *Shariah* assurance. Nevertheless, these descriptive findings reflect preference distributions within the sample and should be validated among active, verified SOTS users before definitive strategic conclusions are drawn.

Table 6. Preference for Islamic FinTech Platform-SOTS

No	The Preference of Retail Investors to Use SOTS	Number	%
1.	IPOT Syariah [PT Indo Premier Sekuritas]	74	12.4%
2.	POEM Syariah [PT Phillip Sekuritas Indonesia]	5	0.8%
3.	RHB Trade Smart Syariah [PT RHB Sekuritas Indonesia]	5	0.8%
4.	STAR Syariah [PT Samuel Sekuritas Indonesia]	1	0.2%
5.	Maybank Trade Syariah [PT Maybank Sekuritas Indonesia]	10	1.7%
6.	BRIGHTS Syariah/D'One Syariah [PT BRI Danareksa Sekuritas]	4	0.7%
7.	iTrade Syariah [PT. CGS-CIMB Sekuritas Indonesia]	13	2.2%
8.	KOINS Syariah [PT Korea Investment and Sekuritas Indonesia]	6	1.0%
9.	HOTS Syariah [PT Mirae Asset Sekuritas Indonesia]	16	2.7%
10.	BIONS [PT BNI Sekuritas]	45	7.6%
11.	MOST Syariah [PT Mandiri Sekuritas]	26	4.4%
12.	POST Syariah [PT Panin Sekuritas Tbk.]	3	0.5%
13.	PROFITS Syariah [PT Phintraco Sekuritas]	5	0.8%
14.	FAST Syariah [PT FAC Sekuritas Indonesia]	5	0.8%
15.	MotionTrade Syariah [PT MNC Sekuritas]	8	1.3%
16.	HPX Syariah [PT. Henan Putihrai Sekuritas]	0	0.0%
17.	ProClick Syariah [PT. Profindo Sekuritas Indonesia]	0	0.0%
18.	NAIK Syariah [PT. NH Korindo Sekuritas Indonesia]	0	0.0%

No	The Preference of Retail Investors to Use SOTS	Number	%
19.	Not a SOTS user yet	370	62.1%
Total		596	100.0%

5.1.5 Measurement Model Evaluation

5.1.5.1 Reliability and Validity

The measurement model demonstrated satisfactory convergent validity and internal consistency reliability. All indicator items achieved factor loadings above the recommended threshold of .70 (Hair et al., 2022). Furthermore, composite reliability (CR) and Cronbach's alpha (α) values for all nine latent constructs exceeded the .70 benchmark, while average variance extracted (AVE) values surpassed the .50 cutoff criterion (Table 7). These results indicate satisfactory indicator reliability, internal consistency, and convergent validity across the measurement model (Hair & Alamer, 2022).

Table 7. Reliability and Validity

Construct	Items	Loading Factor	Cronbach's Alpha (α)	Composite Reliability (pc)	AVE
Attitude Behaviour	AB1	0.897	0.938	0.938	0.843
	AB2	0.928			
	AB3	0.929			
	AB4	0.918			
Government Support	GS1	0.873	0.946	0.947	0.788
	GS2	0.897			
	GS3	0.883			
	GS4	0.881			
	GS5	0.902			
	GS6	0.888			
Islamic Financial Literacy	IFL1	0.903	0.94	0.94	0.805
	IFL2	0.907			
	IFL3	0.898			
	IFL4	0.90			
	IFL5	0.878			
Intention to Use	ITU1	0.901	0.954	0.954	0.845
	ITU2	0.927			
	ITU3	0.93			
	ITU4	0.928			
	ITU5	0.909			
Perceived Ease of Use	PEOU1	0.921	0.951	0.951	0.836
	PEOU2	0.915			
	PEOU3	0.929			
	PEOU4	0.898			
	PEOU5	0.908			
Perceived Trust	PT1	0.92	0.952	0.953	0.84
	PT2	0.923			
	PT3	0.925			
	PT4	0.908			

Construct	Items	Loading Factor	Cronbach's Alpha (α)	Composite Reliability (pc)	AVE
Perceived Usefulness	PT5	0.907	0.967	0.968	0.773
	PU1	0.888			
	PU2	0.831			
	PU3	0.877			
	PU4	0.897			
	PU5	0.882			
	PU6	0.893			
	PU7	0.907			
	PU8	0.888			
	PU9	0.862			
	PU10	0.866			
Religiosity	R1	0.877	0.946	0.948	0.823
	R2	0.911			
	R3	0.92			
	R4	0.918			
	R5	0.909			
User Innovativeness	UI1	0.852	0.934	0.934	0.792
	UI2	0.891			
	UI3	0.927			
	UI4	0.892			
	UI5	0.885			

5.1.5.2 Discriminant Validity

Discriminant validity was assessed using the heterotrait–monotrait ratio of correlations (HTMT). According to Henseler et al. (2015), HTMT values below .85 indicate satisfactory discriminant validity under a conservative threshold, whereas values below .90 are acceptable under a more lenient threshold for exploratory research and conceptual extensions. As reported in Table 8, most construct pairs yielded HTMT values below .85. However, six construct pairs recorded values between .826 and .874, with the highest ratio observed between attitude towards using (ATT) and behavioural intention (ITU) at HTMT = .898. Although this point estimate remained marginally below the .90 threshold, its proximity to the upper boundary indicated substantial empirical overlap, warranting further assessment.

To rigorously evaluate this relationship, HTMT inference was performed using 2,000 bootstrap resamples. The ATT–ITU estimate produced a 95% percentile confidence interval of [0.852, 0.936]. Because the interval did not contain 1.00, the hypothesis that ATT and ITU are perfectly correlated was not supported, providing evidence that the two constructs are empirically distinguishable. However, because the upper bound exceeded .90, strict threshold-based discriminant validity could not be conclusively established based on HTMT alone. Consequently, a rival measurement model was estimated in SmartPLS 4 by merging the indicator items of ATT and ITU into a single combined latent construct. Model comparison revealed that the original two-construct model yielded a lower Bayesian Information Criterion (BIC = 9,505.61) than the unidimensional merged model (BIC = 9,810.88). The substantial difference (Δ BIC = 305.27) strongly supported retaining ATT and ITU as distinct constructs. This specification aligns with TAM, which distinguishes evaluative technological attitudes from motivational readiness to adopt.

Taken together, the empirical evidence supports retaining ATT and ITU as distinct yet closely related constructs. Nevertheless, given their high shared variance, the direct path coefficient between attitude and

behavioural intention should be interpreted with appropriate caution.

Table 8. Discriminant Validity - HTMT (Heterotrait-Monotrait) Ratio – Matrix

	AB	GS	IFL	ITU	PEOU	PT	PU	R	UI
AB									
GS	0.584								
IFL	0.865	0.514							
ITU	0.898	0.546	0.842						
PEOU	0.811	0.677	0.718	0.771					
PT	0.812	0.691	0.731	0.769	0.874				
PU	0.773	0.715	0.687	0.721	0.839	0.858			
R	0.804	0.660	0.755	0.723	0.749	0.826	0.773		
UI	0.779	0.616	0.714	0.723	0.785	0.809	0.730	0.768	

5.1.6 Structural Model Evaluation

5.1.6.1 Collinearity Diagnostics (VIF) and Common Method Bias

Inner Variance Inflation Factors (VIF) were calculated from construct scores for each endogenous structural equation (Table 9). For the attitude towards using (ATT) equation, inner VIF values ranged from 2.07 to 3.72; perceived usefulness ($VIF = 3.72$) and perceived ease of use ($VIF = 3.71$) exceeded the conservative threshold of 3.00 but remained well below the critical collinearity threshold of 5.00 (Hair et al., 2022). For the behavioural intention (ITU) equation, ATT and perceived trust (PT) each recorded a VIF of 2.43, while the single predictor (ATT) of PT registered a VIF of 1.00. These results indicate no evidence of severe lateral collinearity in the inner model, although moderate predictor overlap warrants careful interpretation. Note that outer (indicator-level) VIFs serve as measurement-level diagnostics and are not interpreted as evidence of inner-model collinearity.

Common method bias (CMB) was also systematically evaluated given the single-source, cross-sectional design. Harman's single-factor test revealed that the unrotated first factor accounted for 60.41% of the total indicator variance, exceeding the conventional 50.0% benchmark. Furthermore, full-collinearity VIF values ranged from 2.09 to 5.42, with six of the nine constructs exceeding the 3.30 threshold proposed by Kock (2015). While these diagnostics do not demonstrate that the structural relationships are merely artefacts of method variance, they indicate that common-method bias cannot be completely ruled out. Consequently, high R^2 values and structural path coefficients are interpreted with appropriate analytical caution, causal phrasing is avoided, and future multi-source or longitudinal validation is recommended.

Table 9. Inner-Model Collinearity Assessment

Endogenous construct	Predictor	Inner VIF
AB	GS	2.07
AB	PU	3.72
AB	PEOU	3.71
AB	UI	2.80
AB	R	3.17
AB	IFL	2.43
PT	AB	1.00
ITU	AB	2.43
ITU	PT	2.43

5.1.6.2 Coefficient of Determination (R^2)

The coefficient of determination (R^2) measures the proportion of variance in an endogenous construct explained by its structural predictors (Hair et al., 2022). Following Richter et al. (2016), R^2 values of .75, .50, and .25 are interpreted as strong, moderate, and weak, respectively.

The R^2 values obtained in this study range from moderate to strong. Attitude towards using (ATT) achieved an $R^2 = .774$, indicating that perceived usefulness (PU), perceived ease of use (PEOU), government support (GS), user innovativeness (UI), religiosity (R), and Islamic financial literacy (IFL) collectively explain 77.4% of its variance. Perceived trust (PT) recorded an $R^2 = .589$, with ATT explaining 58.9% of its variance. Behavioural intention to adopt (ITU) achieved an $R^2 = .738$, demonstrating that ATT and PT jointly account for 73.8% of its variance. Overall, the structural framework demonstrates substantial explanatory power. However, in light of the cross-sectional design and common method diagnostics, these figures represent explained statistical variance rather than deterministic causal effects.

5.1.6.3 Out-of-Sample Predictive Relevance ($Q^2_{predict}$)

The PLSpredict procedure (k -fold cross-validation with 10 folds and 10 repetitions) was executed to assess the out-of-sample predictive performance of the model (Shmueli et al., 2019). Positive $Q^2_{predict}$ values indicate that the structural model outperforms a naive linear benchmark. All endogenous indicators yielded $Q^2_{predict}$ values exceeding .50, led by ATT ($Q^2_{predict} = .760$), PT ($Q^2_{predict} = .695$), and ITU ($Q^2_{predict} = .693$). Comparison of Root Mean Squared Error (RMSE) and Mean Absolute Error (MAE) metrics across the PLS-SEM and linear model (LM) benchmarks confirmed that the structural model possesses meaningful out-of-sample predictive capability.

5.1.6.4 Effect Size (f^2)

The relative contribution of each exogenous construct to the explained variance of an endogenous variable was evaluated using Cohen's f^2 effect size. Following Cohen (1988) and Richter et al. (2016), f^2 values of .35, .15, and .02 denote large, medium, and small effect sizes, respectively.

The structural effect sizes were estimated as follows:

- ATT → PT:** $f^2 = 1.433$ (large)
- ATT → ITU:** $f^2 = .760$ (large)
- IFL → ATT:** $f^2 = .309$ (medium)
- PT → ITU:** $f^2 = .062$ (small)
- PEOU → ATT:** $f^2 = .052$ (small)
- GS → ATT:** $f^2 = .003$ (negligible)

These results establish that attitude exerts a dominant effect on both perceived trust and behavioral intention, while Islamic financial literacy serves as the strongest antecedent to attitude. Perceived ease of use and perceived trust yield small direct effect sizes, whereas government support exerts a negligible direct effect on attitude.

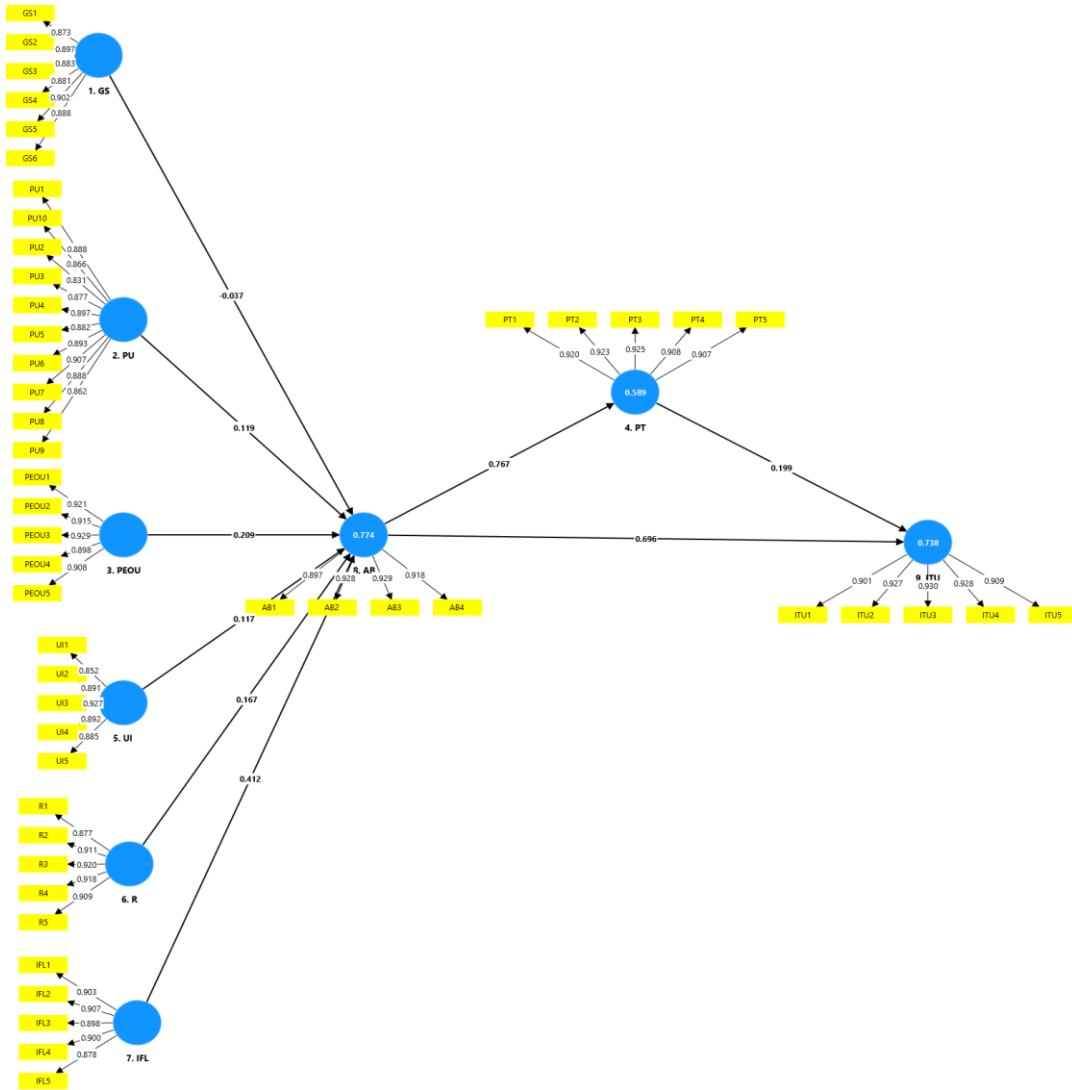


Figure 5. PLS-SEM Structural Model (Inner Model)

5.1.7 Hypothesis Testing Results and Mediation Analysis

The bootstrapping results (5,000 resamples) indicate that seven of the nine direct structural paths are empirically supported. Specifically, **H1** and **H2** are not supported, as their p -values exceed the .05 significance threshold, indicating that government support ($GS \rightarrow ATT$) and perceived usefulness ($PU \rightarrow ATT$) do not exert a statistically significant influence on attitude towards using SOTS.

In contrast, hypotheses **H3** through **H9** are fully supported ($p < .05$). Perceived ease of use (PEOU), user innovativeness (UI), religiosity (R), and Islamic financial literacy (IFL) exhibit significant positive associations with attitude towards using (ATT). Subsequently, ATT and perceived trust (PT) significantly predict the downstream endogenous constructs within the structural model (**H7**, **H8**, and **H9**).

Regarding the mediating mechanism (**H10**), the indirect effect of attitude on behavioural intention via perceived trust ($ATT \rightarrow PT \rightarrow ITU$) is positive and statistically significant ($\beta = .153, p < .001$), while the direct effect ($ATT \rightarrow ITU$) remains strong and significant ($\beta = .696, p < .001$). The Variance Accounted For (VAF) was calculated as follows:

$$VAF = \frac{0.153}{0.153 + 0.696} = 18.0\%$$

Following the mediation taxonomy of Zhao et al. (2010), this empirical pattern confirms complementary partial mediation. Perceived trust functions as a statistically significant yet modest indirect mechanism, rather than the primary driver, through which attitude towards using SOTS translates into behavioural intention to adopt.

Table 10. Path Coefficient - Hypothesis Testing Result

Hypothesis	Beta (β)	Sample mean (M)	STDEV	T values	P values	Significance/Result
H1: GS -> AB	-0.037	-0.036	0.040	0.948	0.343	Not Supported
H2: PU -> AB	0.119	0.119	0.072	1.647	0.100	Not Supported
H3: PEOU-> AB	0.209	0.205	0.063	3.339	0.001	Supported
H4: UI -> AB	0.117	0.118	0.050	2.353	0.019	Supported
H5: R -> AB	0.167	0.164	0.059	2.830	0.005	Supported
H6: IFL -> AB	0.412	0.419	0.065	6.392	0.000	Supported
H7: AB -> PT	0.767	0.767	0.028	27.186	0.000	Supported
H8: AB -> ITU	0.696	0.695	0.051	13.596	0.000	Supported
H9: PT -> ITU	0.199	0.201	0.053	3.792	0.000	Supported
H10: AB -> PT -> ITU	0.153	0.155	0.043	3.573	0.000	Supported

5.2 Discussion

Islamic financial literacy emerged as the strongest antecedent of attitude towards using SOTS ($\beta = .199 = .412$, $f^2 = .309$), followed by perceived ease of use, religiosity, and user innovativeness. This structural pattern is theoretically meaningful within the context of a constrained technology. The results suggest that investors' attitudes are driven more by their capacity to comprehend the *Shariah* governance structure and platform usability than by broad perceptions of generic technological utility. While religiosity provides fundamental value alignment, Islamic financial literacy enables investors to evaluate *Shariah* certification integrity, permissible transaction boundaries, and asset-screening rules. Given the substantial proportion of prospective and novice investors in the sample (40.6% prospective and 53.2% with less than six months of experience), these relationships should be interpreted primarily as cognitive mechanisms governing early-stage intention formation rather than as established drivers of experienced-user retention. Attitude towards using was strongly associated with both behavioural intention and perceived trust. However, the discriminant validity assessment indicated substantial empirical overlap between ATT and ITU (HTMT = .898), while common-method diagnostics indicated that single-source bias cannot be completely ruled out. Although rival measurement-model testing supported retaining the two constructs as distinct ($\Delta BIC = 305.27$), their empirical proximity implies that the large ATT $\rightarrow$ ITU path coefficient $\beta = .696$ may partly reflect conceptual overlap and common-method variance inherent in cross-sectional survey designs. Perceived trust exerted a smaller direct effect on behavioural intention ($\beta = .199$, $f^2 = .062$), while the calculated 18.0% VAF indicates that trust operates as a complementary partial mediator rather than a primary mechanism linking attitude to adoption intention.

The non-significant relationship between perceived usefulness and attitude (H2, $p > .05$) represents one of the central theoretical findings of this study. Conventional TAM applications position perceived usefulness as an important determinant of technology acceptance (Davis et al., 1989). However, SOTS does not necessarily provide superior generic execution speed or trading functionality compared with established conventional platforms. Instead, its distinctive value proposition lies in excluding non-*Shariah*-compliant equities and restricting practices such as short selling and margin trading. Taken together, the results suggest that retail investors differentiate SOTS more through *Shariah* compliance assurance, religious alignment, Islamic

financial literacy, and interface usability than through generic perceptions of return maximisation or trading efficiency.

This theoretical insight also helps contextualise the macro-level denominator effect identified in the Introduction: values-based adoption can expand substantially in absolute terms (increasing 2.5-fold from 85,891 to 217,157 users) without keeping pace with the rapid onboarding of the broader retail-investor market. Similarly, government support exhibited a non-significant direct effect on attitude (**H1**, $p > .05$). One possible explanation is that retail investors may perceive SOTS primarily as a service delivered by individual securities brokerages rather than as a direct outcome of public policy or regulatory initiatives. These null findings do not imply that institutional support or platform utility is irrelevant; rather, they indicate that perceived government support and generic usefulness did not explain additional variance in investor attitudes once personal innovativeness, usability, religiosity, and Islamic financial literacy were accounted for in the structural model.

Finally, feature-level descriptive evaluations provide practical direction for future platform development despite the non-significant aggregate PU path. Survey respondents expressed high positive agreement with expanding platform capabilities: 75.0% favoured integrating SOTS with *sukuk*, Islamic mutual funds, exchange-traded funds (ETFs), and real estate investment trusts (REITs) (item PU8); 77.1% supported incorporating digital educational modules, financial planning tools, electronic initial public offerings (e-IPOs), equity crowdfunding, and automated robo-advisory features (item PU9); and 76.2% endorsed integrating Islamic social finance mechanisms such as stock *zakat*, *sadaqah*, and *waqf* services (item PU10). These user preferences provide preliminary support for transitioning from single-asset execution tools towards a phased *Shariah* Integrated Investment Platform (SIIP). Nevertheless, because these preferences reflect intention-stage data, they should be validated among active, verified SOTS traders before substantial commercial investment in such platform development.

6. Conclusion, Recommendations, and Future Research Directions

6.1 Conclusion

This study examined the determinants of current and prospective retail investors' intention to use SOTS in the Indonesian Islamic capital market by extending the Technology Acceptance Model (TAM) with Islamic-contextual variables and incorporating perceived trust as a mediating factor. Utilising partial least squares structural equation modelling (PLS-SEM) on data from 596 respondents, the empirical findings provide several important insights into technology adoption within constrained, values-based financial markets. The empirical results indicate that perceived ease of use (PEOU), user innovativeness (UI), religiosity (R), and Islamic financial literacy (IFL) are significantly and positively associated with attitude towards using SOTS (ATT). These findings indicate that favourable investor attitudes are associated primarily with operational usability, personal innovativeness, and Islamic value-based factors rather than with generic perceived usefulness or institutional government support. Ease of platform operation may reduce friction in initial engagement, while user innovativeness reflects personal readiness for digital financial solutions. Religiosity and Islamic financial literacy further support positive attitudes by reinforcing alignment with *Shariah* principles and enabling retail investors to navigate *Shariah*-compliant capital-market instruments, operational boundaries, and platform rules.

Moreover, attitude towards using (ATT) significantly predicts behavioural intention to adopt SOTS (ITU), both directly and indirectly through perceived trust (PT). The calculated Variance Accounted For (VAF = 18.0%) indicates that perceived trust functions as a complementary partial mediator. This highlights the relevance of trust in Islamic FinTech adoption, while demonstrating that the direct attitude–intention pathway remains the more prominent pathway associated with behavioural intention. In contrast, government support (GS) and perceived usefulness (PU) do not significantly predict attitude towards using SOTS. These null findings suggest that generic utilitarian considerations and institutional support, on their own, are insufficient to explain adoption intentions when personal innovativeness, interface usability, religiosity, and Islamic financial literacy are simultaneously accounted for in the structural model. This study contributes theoretically by contextualising TAM within the securities-trading domain and providing empirical evidence on the mediating role of perceived trust in Islamic FinTech adoption. It demonstrates the important role of Islamic financial literacy, religiosity, and user innovativeness in shaping adoption attitudes towards a *Shariah*-constrained digital trading interface. Although bounded by a cross-sectional, self-reported survey design in Indonesia, the findings provide useful insights for strengthening SOTS engagement and supporting the sustainable development of the Indonesian Islamic capital market.

6.2 Recommendations and Future Research Directions

From a practical and managerial perspective, exchange members (securities brokerages) should prioritise streamlined onboarding, intuitive interface design, transparent security protocols, and prominent displays of DSN-MUI certification and *Shariah* governance. For regulatory bodies and educational institutions—including the Indonesia Stock Exchange (IDX), Financial Services Authority (OJK), and DSN-MUI—policy initiatives should focus on verifiable disclosure, system interoperability, investor protection, and targeted Islamic financial literacy campaigns rather than assuming that generic public policy support alone will shape positive investor attitudes. The strong structural relationship between Islamic financial literacy and investors' attitudes also suggests that educational programmes should extend beyond general financial awareness towards functional training on *Shariah* screening methodologies, permissible trading practices, and the practical operation of SOTS platforms.

Future research should extend this framework by linking self-reported survey data to observed behavioural outcomes, such as verified account opening, trading frequency, trading volume, and long-term platform retention. Employing longitudinal or experimental research designs would further help distinguish early-stage intention formation from subsequent adoption and sustained platform usage.

Methodologically, probability-based or stratified sampling techniques would enhance sample representativeness across broader geographic regions beyond Java. Multi-group analysis (MGA) and measurement invariance testing using the Measurement Invariance of Composite Models (MICOM) procedure could be conducted to evaluate potential structural heterogeneity across demographic and operational segments, such as active versus prospective investors, age cohorts, income levels, and religious affiliations. Finally, future model extensions could incorporate structural barriers, such as switching costs, status quo bias, perceived financial sacrifice, and perceived risk, or explore formative operationalisations of Islamic financial literacy to better capture the complexities of capital-market adoption.

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Zakat, Technological Innovation, and Social Entrepreneurship: A PLS-SEM Analysis of Perceived Sustainable Development Impact

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Abstract

This study investigates whether stakeholders' awareness of and commitment to zakat are associated with perceived sustainable development impact, and whether technological innovation and social entrepreneurship mediate this relationship. Grounded in *maqasid al-shariah* as a normative lens and resource orchestration as the explanatory logic, the study develops a four-construct model linking zakat awareness and commitment (ZAC), technological innovation (TIN), social entrepreneurship (SEO), and perceived sustainable development impact (ZSD). Data from 218 purposively sampled stakeholders were analysed using partial least squares structural equation modelling (PLS-SEM) with 5,000 bootstrap resamples and percentile confidence intervals. The findings indicate that technological innovation is the strongest correlate of social entrepreneurship ($\beta = 0.381$, $p < 0.001$), while social entrepreneurship is the strongest correlate of perceived sustainable development impact ($\beta = 0.338$, $p < 0.001$). Although ZAC exhibits a direct association with the final outcome ($\beta = 0.155$, $p = 0.028$), it is not significantly associated with social entrepreneurship. Social entrepreneurship mediates the association between technological innovation and perceived sustainable development impact (indirect effect = 0.129, $p < 0.001$). However, evidence regarding the indirect paths originating from ZAC remains inconclusive across the inferential criteria. The model accounts for 24.0 per cent of the variance in the target outcome (adjusted $R^2 = 0.229$). This paper offers a preliminary, perception-based evaluation of the zakat–innovation–entrepreneurship–development continuum as an integrated system and identifies the conditions under which broader claims may be warranted.

Keywords: Zakat, Islamic social finance, social entrepreneurship, technological innovation, sustainable development

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1. Introduction

Zakat is an obligatory annual levy on qualifying wealth and one of the five pillars of Islam. The sums involved are substantial and, unlike most development aid, recur annually; conservative estimates place the annual global zakat potential between US\$200 billion and US\$1 trillion, well above the aid reaching many Muslim-majority economies (Obaidullah & Shirazi, 2017). To date, most scholarship on zakat has concentrated on the amounts collected and the efficiency of disbursement. Considerably less is known about the intermediate mechanisms through which zakat might contribute to durable development rather than short-term relief (Widiastuti et al., 2021). Two contemporary developments have reshaped the context in which this issue is considered. First, social entrepreneurship has emerged as a means of creating social value through enterprise-based approaches, sharing with zakat a fundamental concern for improving the position of disadvantaged groups rather than merely providing temporary aid (Santos, 2012). Second, technological innovation—particularly financial technology—has transformed how zakat is collected, verified, allocated, and monitored (Ninglasari & Muhammad, 2021; El Amri et al., 2025). Together, these developments suggest a testable proposition that has not yet been examined as an integrated system: that zakat, technological innovation, and social enterprise may form a sequential pathway leading to sustainable development.

The supporting evidence for this pathway remains fragmented. Research on zakat compliance and

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governance often stops at collection; research on "productive zakat" typically treats enterprise as an end outcome rather than an intermediate mechanism and rarely incorporates technology; and research on digitalisation remains largely administrative in focus. Table 1 summarises this literature positioning in detail. Consequently, three questions remain open: (1) Is stakeholders' awareness of and commitment to zakat associated with their perceptions of innovation and enterprise capacity? (2) Is perceived technological innovation an antecedent of perceived social entrepreneurship capacity in the zakat setting, or merely a separate correlate of development? (3) Through which routes, direct or mediated, is zakat awareness associated with perceived sustainable development impact? Answering these questions is highly consequential for developing and Muslim-majority economies, where fiscal space is constrained, formal financial inclusion is uneven, and many populations remain outside conventional welfare systems. Zakat offers a decentralised, faith-anchored resource whose legitimacy rests on community trust (Obaidullah & Shirazi, 2017), while mobile connectivity provides a modern technological infrastructure that did not previously exist. Whether belief, innovation, and enterprise actually align in the way this proposition assumes remains an empirical matter.

To address this, we test an integrated structural model in which zakat awareness and commitment (ZAC) serves as the exogenous construct, technological innovation (TIN) and social entrepreneurship (SEO) act as sequential intermediary constructs, and perceived sustainable development impact (ZSD) is the target outcome. The model is estimated using partial least squares structural equation modelling (PLS-SEM) based on 218 usable stakeholder responses. Three crucial qualifications frame what follows and are central to interpreting the findings. First, every construct is measured as a stakeholder perception; nothing in this study directly observes actual zakat allocation, technology adoption rates, venture formation, or realised developmental outcomes. Second, the design is cross-sectional; thus, the estimates represent associations consistent with the hypothesised ordering rather than evidence of causation. Third, the constructs are based on a small number of ordinal items from a newly developed instrument, which constrains the interpretive weight that can be placed on the structural paths. Consequently, this study's contribution is a preliminary, perception-based test of an integrated theoretical mechanism, alongside a clear specification of what stronger future empirical tests would require.

The paper proceeds as follows. Section 2 reviews the literature and develops the hypotheses. Section 3 sets out the methodology. Section 4 reports the results. Section 5 discusses the findings, draws out their implications, and outlines the study's limitations. Section 6 concludes.

2. Literature Review

2.1 Zakat, *Maqasid al-Shariah*, and Sustainable Development

Zakat is conventionally levied at 2.5 per cent of qualifying wealth held above the nisab threshold, and it may be disbursed only to the eight categories of beneficiaries (*asnaf*) identified in the Qur'an (al-Tawbah, 9:60). Classical *fiqh* views it simultaneously as an act of worship and an instrument of socio-economic policy (Qardawi, 1999). Its developmental significance derives from the *maqasid al-shari'ah*—the higher objectives of Islamic law—which orient economic activity towards protecting and enriching faith, life, intellect, progeny, and wealth (Chapra, 2008). As these objectives extend beyond mere subsistence to encompass the development of human capabilities, a substantial body of literature argues that zakat should be deployed in ways that enhance recipients' productive capacity.

This capability-oriented interpretation aligns with the global sustainable development agenda, and several studies have mapped Islamic social finance onto the Sustainable Development Goals (SDGs) (Abdullah, 2018; Ahmed et al., 2015). For instance, Widiastuti et al. (2021) find that productive zakat programmes outperform consumptive distribution when business growth is modelled as an intervening variable. This conversion is not automatic, however. Transparency, institutional professionalism, and accountability constrain the developmental impact of the funds collected (Bin-Nashwan et al., 2021; Saad & Haniffa, 2014). Because these governance conditions shape how stakeholders assess the effectiveness of zakat-funded initiatives, we treat perceived sustainable development impact as a perception-based construct throughout this study and name it accordingly. One critical boundary condition must be stated at the outset, as it limits what may subsequently be recommended. Zakat is not generic patient capital. Eligibility is strictly restricted to the *asnaf*; most schools of jurisprudence require *tamlik* (the direct transfer of ownership to the eligible recipient); and national zakat laws and Shariah governance frameworks further constrain permissible deployment (Qardawi, 1999). Proposals to redirect zakat towards enterprise must therefore be framed as questions concerning permissible programme design within these constraints, rather than as a general licence to reallocate funds at will. This issue is revisited in Section 5.

2.2 Social Entrepreneurship as a Shariah-Constrained Mechanism

Social entrepreneurship involves identifying and pursuing opportunities to create social value through innovative, enterprise-based approaches, placing value creation ahead of value capture and directing surplus towards a social mission (Santos, 2012). Its affinity with zakat lies in a shared orientation towards addressing the structural dimensions of disadvantage, rather than merely treating its symptoms, and a mutual commitment to preserving the dignity of productive participation. Where asset-poor entrepreneurs cannot access conventional finance, non-repayable capital can reduce the risks faced by early-stage ventures serving disadvantaged populations (Obaidullah, 2008). If so, part of zakat's developmental contribution may be realised through the enterprise activity it enables, positioning social entrepreneurship as an intermediary mechanism rather than an end in itself. This rationale underpins the proposed structural model. It should, however, be interpreted as a hypothesis concerning perceived capacity, as the indicators capture stakeholders' familiarity with and willingness to support social entrepreneurship, rather than actual venture formation.

2.3 Technological Innovation and Digital Zakat Administration

Innovation lowers the cost of reaching beneficiaries, extends the scale at which solutions operate, and enables new combinations of resources (Phillips et al., 2015). Within Islamic social finance, its most visible expression is the digitalisation of zakat administration: digital platforms now facilitate collection, eligibility verification, allocation, and impact tracking. This digitalisation addresses the trust and accountability deficits that have long constrained confidence in traditional zakat institutions (Ninglasari & Muhammad, 2021; El Amri et al., 2025). Technology also reshapes the opportunity structure for ventures supported by zakat. Mobile connectivity, digital marketplaces, and low-cost productivity tools significantly reduce the barriers to starting and operating small enterprises. Consequently, innovation serves not only as an administrative tool but also as a plausible enabling condition for social entrepreneurship, placing it upstream of enterprise activity in our hypothesised ordering.

2.4 Prior Empirical Evidence and the Research Gap

Table 1: Positioning of the present study against prior empirical work

Research stream	Representative study	Constructs / links tested	Not addressed
Zakat compliance and institutional governance	Bin-Nashwan et al. (2021); Saad and Haniffa (2014)	Religiosity, trust, perceived transparency → intention to pay zakat	Stops at collection; no enterprise, innovation, or development outcome
Productive zakat and poverty alleviation	Widiastuti et al. (2021)	Zakat empowerment programme → business growth → <i>mustahiq</i> welfare	Technology absent; enterprise modelled as outcome, not mechanism
Islamic social finance and the SDGs	Abdullah (2018); Ahmed et al. (2015)	Conceptual mapping of <i>maqasid al-shariah</i> onto SDG targets	Normative and conceptual; no estimated model
Digitalisation of zakat administration	Ninglasari and Muhammad (2021); El Amri et al. (2025)	Fintech adoption → collection efficiency, transparency, targeting	Administrative focus; no link to enterprise formation or perceived impact
Social-enterprise finance	Santos (2012); Phillips et al. (2015)	Catalytic capital and social innovation → social value creation	Developed outside Islamic finance; zakat's Shariah constraints not considered
This study	—	ZAC → TIN → SEO → ZSD estimated as one mediated system	Perception-based and cross-sectional; see Section 5

Table 1 synthesises the positioning of the present model against the foundational literature streams from which it draws. Three key observations emerge. First, the compliance literature effectively explains the supply of funds but stops at collection. Second, the productive-zakat literature establishes that capability-building disbursement can outperform consumptive relief; yet, it models enterprise as an end outcome and generally omits the role of technology. Third, the digitalisation literature documents administrative efficiency gains without linking them to enterprise formation or broader perceived impact. To date, no study identified in this review estimates awareness, innovation, social entrepreneurship, and perceived development impact as a single mediated system,

and mediation-based designs capable of distinguishing direct from indirect associations remain scarce in this field.

Competing explanations should be acknowledged rather than assumed away. Variables such as digital literacy, prior direct experience with zakat, institutional trust, infrastructure quality, and the regulatory environment could each contribute to the observed patterns without any of the hypothesised mechanisms operating. Because our cross-sectional design cannot adjudicate between these alternative explanations, this is treated as a foundational limitation (detailed in Section 5) rather than a residual oversight.

Note. The comparison is illustrative rather than exhaustive and is limited to the streams that inform the hypothesised model.

3. Conceptual Framework

3.1 Theoretical integration

The two theoretical frameworks employed in this study serve distinct but complementary roles, and conflating them would weaken their respective contributions. *Maqasid al-shari'ah* functions as a normative lens: it specifies what constitutes a defensible developmental outcome in Islamic terms, namely the enhancement of human capabilities rather than the mere relief of immediate need. However, it does not, by itself, predict empirical associations among the constructs examined in this study. Resource orchestration, conversely, provides the explanatory logic for how resources can be transformed into value through their effective structuring, bundling, and leveraging (Sirmon et al., 2011). Combined, these perspectives generate a testable proposition: that developmental outcomes consistent with the *maqasid* may be more strongly associated with the effective mobilisation of enabling mechanisms than with resource transfer alone, with technology and enterprise representing two such mechanisms.

One fundamental caveat regarding the level of analysis must be acknowledged. Resource orchestration is inherently a firm-level theory, whereas the unit of analysis in this study is the individual stakeholder. Therefore, the study does not claim to observe resource orchestration directly. Rather, it examines whether stakeholders' perceptions are patterned in a manner consistent with an orchestration account. This represents a more conservative yet empirically tractable application of the theoretical perspective. Accordingly, the constructs are measured as individual-level perceptions rather than as direct measures of organisational capabilities or resource-orchestration processes. Table 2 presents the conceptual and operational definitions, level of analysis, and dimensionality of each construct.

Table 2: Construct definitions, operationalisation, and level of analysis

Construct	Conceptual definition	Operational definition	Level of analysis	Dimensionality
Zakat awareness and commitment (ZAC)	A respondent's understanding of zakat and endorsement of its developmental role and broader educational importance	Two ordinal items addressing belief in zakat's developmental role and support for zakat education (ZAC2, ZAC3)	Individual	Reflective, unidimensional
Perceived technological innovation (TIN)	The importance a respondent attaches to innovation and technology as enabling mechanisms for social ventures	Two ordinal items addressing the importance of innovation and technology for social-venture success (TIN1, TIN2)	Individual perception	Reflective, unidimensional
Social entrepreneurship support (SEO)	A respondent's familiarity with, and willingness to support, enterprise-based approaches to social value creation	Two ordinal items addressing familiarity with social entrepreneurship and likelihood of providing support (SEO1, SEO3)	Individual	Reflective, unidimensional
Perceived sustainable development impact (ZSD)	A respondent's appraisal of the effectiveness, sustainability, and participatory character of zakat-funded initiatives	Three ordinal items addressing effectiveness, sustainability, and stakeholder engagement (ZSD1–ZSD3)	Individual perception	Reflective, unidimensional

Note. All four constructs are specified reflectively. The reflective specification and its limitations are discussed further in Section 4.

3.2 Hypotheses

Awareness of and commitment to zakat may shape stakeholders' perceptions of how zakat resources can be mobilised for broader social purposes. Stakeholders who understand zakat and endorse its developmental role may be more receptive to enterprise-based approaches to social value creation and may attach greater importance to technological innovation that facilitates such approaches (Bin-Nashwan et al., 2021).

H1: Zakat awareness and commitment is positively associated with social entrepreneurship support.

H2: Zakat awareness and commitment is positively associated with perceived technological innovation.

Technological innovation can expand the range of feasible social ventures by reducing entry barriers, improving operational efficiency, and extending market and stakeholder reach (Phillips et al., 2015). Where innovation and technology are perceived as important, enterprise-based approaches to social value creation may consequently be viewed as more feasible and supportable. Technological innovation may also be associated directly with perceived development outcomes through greater administrative transparency, accessibility, and institutional reach (Ninglasari & Muhammad, 2021).

H3: Perceived technological innovation is positively associated with social entrepreneurship support.

H4: Perceived technological innovation is positively associated with perceived sustainable development impact.

Social entrepreneurship provides an enterprise-oriented mechanism through which resources can be mobilised and transformed into sustained social value rather than temporary relief (Santos, 2012). It may therefore represent a proximate mechanism associated with perceived sustainable development impact. In addition, zakat awareness and commitment may be directly associated with perceived impact through the trust, legitimacy, and developmental orientation that may arise from greater understanding of zakat as a social institution.

H5: Social entrepreneurship support is positively associated with perceived sustainable development impact.

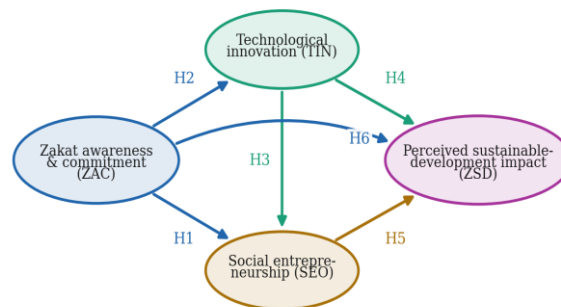
H6: Zakat awareness and commitment is positively associated with perceived sustainable development impact.

The proposed sequential ordering implies three mediation hypotheses. These hypotheses are formulated *a priori* to ensure that the proposed pathways are grounded in the conceptual framework rather than identified *post hoc* during estimation. The mediation relationships are interpreted as statistical associations consistent with the proposed theoretical pathways and are not taken as evidence of causal effects.

H7: Perceived technological innovation mediates the association between zakat awareness and commitment and social entrepreneurship support.

H8: Social entrepreneurship support mediates the association between perceived technological innovation and perceived sustainable development impact.

H9: Perceived technological innovation and social entrepreneurship support serially mediate the association between zakat awareness and commitment and perceived sustainable development impact.



Mediation hypotheses: H7 (ZAC → TIN → SEO) · H8 (TIN → SEO → ZSD) · H9 (ZAC → TIN → SEO → ZSD)

Figure 1: Hypothesised Relationships among the Constructs.

ZAC = zakat awareness and commitment; TIN = perceived technological innovation; SEO = social entrepreneurship support; ZSD = perceived sustainable development impact. Arrows denote hypothesised associations rather than causal effects.

4. Research Methodology

This study employs a quantitative, cross-sectional survey design within a post-positivist paradigm to examine hypothesised associations among four latent constructs. The unit of analysis is the individual stakeholder, and data were collected through a structured questionnaire. Given the cross-sectional and non-experimental design, the findings are interpreted as statistical associations rather than causal effects.

Data were collected in Bangladesh, specifically in the Dhaka and Chittagong divisions, between July and December 2025. Non-probability purposive sampling was used through online and face-to-face recruitment, including Google Forms, door-to-door distribution, professional mailing lists, institutional networks, and the BIM Alumni Group. Respondents were eligible if they had prior exposure to, or a stated interest in, zakat, social entrepreneurship, or innovation. The term stakeholder encompasses zakat payers and recipients, Islamic social finance professionals, and educated members of the general public who may reasonably hold informed views of zakat-funded activities. As recruitment was open rather than based on a defined invitation list, a conventional response rate could not be calculated. Total of 385 questionnaires distributed, 223 responses were received. Five cases were removed through listwise deletion because of missing values, leaving 218 complete observations for structural analysis. Accordingly, demographic results in Table 3 are based on $N = 223$, whereas analyses from Section 5.2 onwards use $n = 218$. The sample comprised 76.7 per cent male respondents and 78.0 per cent with a master's degree, indicating a relatively specialised and highly educated stakeholder group. The findings are therefore not intended to represent the wider population statistically.

The questionnaire comprised demographic and substantive sections covering zakat awareness and commitment (ZAC), perceived technological innovation (TIN), social entrepreneurship support (SEO), and perceived sustainable development impact (ZSD). The instrument was developed specifically for this study and employed three- or four-category ordinal response scales, with higher codes indicating stronger agreement or perceived importance. The questionnaire and available expert-review and pilot-testing documentation are provided as supplementary materials. Three indicators (ZAC1, SEO2, and ZSD4) were removed before structural estimation using an outer-loading threshold of 0.60, provided that conceptual coverage was not substantially affected. Because item retention was based on the same sample used for estimation, the resulting measurement properties should be regarded as sample-specific rather than definitive scale validation. All four constructs were specified reflectively. This specification is strongest for TIN, while the rationale is more qualified for ZAC and SEO. In particular, the retained SEO indicators capture familiarity with and willingness to support social entrepreneurship; therefore, SEO is interpreted as a provisional measure of enterprise-related disposition and support rather than organisational capacity.

The ordinal and coarse-grained nature of the indicators represents a further limitation because the PLS algorithm uses Pearson correlations, making the treatment of three- and four-category responses as approximately continuous a measurement approximation. This issue is particularly relevant to ZAC, whose retained indicators have means of 2.92 and 2.94 on a three-point scale, indicating strong upper-end concentration and restricted variance. Such restriction may attenuate observed associations and reduce the ability to detect smaller effects. The realised sample of 218 observations was evaluated using the inverse square-root method rather than the conventional ten-times rule (Hair et al., 2022). Approximately 155 observations are required to detect a minimum path coefficient of 0.20 at $\alpha = 0.05$ with 80 per cent power, compared with approximately 274 for a coefficient of 0.15. Thus, the sample provides reasonable power for effects of approximately 0.20 or larger but limited power for smaller effects. This limitation is relevant to the non-significant ZAC $\rightarrow$ SEO association ($\beta = 0.097$), which should not be interpreted as evidence that no association exists.

The model was estimated using the path-weighting inner weighting scheme and Mode A outer estimation with correlation weighting. Listwise deletion ensured a consistent analytical sample of 218 observations, and all reported path coefficients are standardised. Inference was based on 5,000 bootstrap resamples with two-tailed testing at $\alpha = 0.05$. The primary inferential criterion was the two-sided 95 per cent bootstrap confidence interval, with an effect considered supported when the interval excluded zero (Hair et al., 2022). Bootstrap t-statistics and p-values were reported as secondary evidence. Where the two criteria disagreed, the relationship was classified as inconclusive. Two effects fell into this category and are discussed accordingly in Section 5.4. Estimation settings, software information, random seed, and complete output are provided in the submitted estimation materials. Measurement assessment covered indicator reliability, internal consistency (Cronbach's alpha, ρ , and composite reliability), convergent validity (AVE), and discriminant validity using the Fornell–Larcker criterion (Fornell & Larcker, 1981) and HTMT (Henseler et al., 2015). Structural assessment included lateral collinearity, path coefficients, R^2 and adjusted R^2 , effect sizes (f^2), and predictive relevance (Q^2), assessed through blindfolding with an omission distance of seven.

Since predictor and criterion measures were obtained from the same respondents using a single questionnaire, common method variance was considered a potential source of bias. Procedural safeguards included respondent anonymity and the use of clearly differentiated response formats to reduce evaluation apprehension and response-pattern effects. Harman's single-factor test indicated that the first unrotated factor accounted for 30.6 per cent of the total variance, below the commonly cited 50 per cent threshold (Podsakoff et al., 2003). This result does not, however, establish the absence of common method bias, given the limited diagnostic sensitivity of Harman's test. A marker-variable or full-collinearity assessment was not conducted; therefore, same-source bias cannot be completely ruled out and should be considered when interpreting the reported associations.

5. Results and Discussion

5.1 Demographic profile

Table 3 presents the profile of the 223 respondents. The sample was predominantly male (76.7 per cent) and highly educated, with 78.0 per cent holding a master's degree and 16.6 per cent holding a bachelor's degree. Most respondents were aged 26–35 (52.5 per cent) or 36–45 (28.7 per cent). Familiarity with zakat was high (93.7 per cent), while 56.1 per cent reported having contributed to or received zakat funds, and 52.5 per cent were aware of zakat-funded enterprise or innovation initiatives.

Table 3: Demographic profile of respondents (N = 223)

Characteristic	Category	n	%
Gender	Male	171	76.7
	Female	51	22.9
	Prefer not to say / other	1	0.4
Age (years)	Under 18	2	0.9
	18–25	9	4.0
	26–35	117	52.5
	36–45	64	28.7
	46–55	24	10.8
	56 and above	5	2.2
	Not reported	2	0.9
Education	Master's degree	174	78.0
	Bachelor's degree	37	16.6
	Doctoral degree	4	1.8
	Other / postgraduate diploma	5	2.2
	High school	3	1.3
Familiar with zakat	Yes	209	93.7
	No	12	5.4
	Maybe	2	0.9
Contributed to / received zakat	Yes	125	56.1
	No	83	37.2
	Maybe	15	6.7
Aware of zakat-funded initiatives	Yes	117	52.5
	No	81	36.3
	Maybe	25	11.2

Note. Percentages are of the total sample. Two respondents recorded an age under 18; see Section 5.9.

Table 4 reports the descriptive statistics for the retained indicators (n = 218). All indicator means exceed their respective scale midpoints. The two ZAC indicators exhibit substantial departures from normality (skewness = –4.36 and –4.73; excess kurtosis = 19.69 and 23.65), reflecting a pronounced ceiling effect, with almost all respondents strongly endorsing zakat's developmental role. This has two important implications for the analysis. First, the restricted variance limits the extent to which differences in the ZAC construct can be explained. Second, it may produce a highly asymmetric bootstrap distribution for product terms involving ZAC, potentially contributing to the criterion disagreement reported in Section 5.4.

Table 4: Descriptive statistics for the retained indicators (n = 218)

Construct	Indicator	M	SD	Skew.	Kurt.
Zakat awareness & commitment (ZAC)	ZAC2: Belief in zakat's developmental role	2.92	0.32	–4.36	19.69
	ZAC3: Support for zakat education/outreach	2.94	0.28	–4.73	23.65

Technological innovation (TIN)	TIN1: Importance of innovation & technology for SE	2.75	0.48	-1.76	2.26
	TIN2: Importance of innovation for SE success	2.80	0.46	-2.19	4.11
Social entrepreneurship (SEO)	SEO1: Familiarity with social entrepreneurship	2.27	0.67	-0.38	-0.80
	SEO3: Likelihood to support SE initiatives	3.32	0.70	-0.61	-0.45
Perceived sustainable-development impact (ZSD)	ZSD1: Effectiveness of zakat initiatives (SE & innovation)	2.66	0.49	-0.91	-0.62
	ZSD2: Sustainability of zakat initiatives	3.34	0.72	-0.83	0.16
	ZSD3: Stakeholder engagement & collaboration	3.40	0.69	-0.97	0.63

Note. M = mean; SD = standard deviation; Skew. = skewness; Kurt. = excess kurtosis. Higher values denote stronger agreement or greater perceived importance. Scales have three or four categories; see Appendix A.

5.2 Measurement Model

loadings are all positive and, following purification, meet or approach the 0.70 benchmark. The two lowest loadings (0.615 for SEO1 and 0.673 for ZSD3) were retained on content grounds, as removing either indicator would not raise its parent construct's AVE above the level already achieved. Composite reliability (CR) ranges from 0.748 to 0.823, and AVE ranges from 0.579 to 0.699, exceeding the conventional thresholds of 0.70 and 0.50, respectively. These figures should not, however, be interpreted as definitively establishing construct validity. Cronbach's alpha (α) and ρ_A are low for three of the four constructs, and particularly low for ZAC ($\alpha = 0.337$; $\rho_A = 0.352$). Although this partly reflects the known sensitivity of Cronbach's alpha to a small number of indicators, it does not fully explain the result. With two indicators, alpha is a monotonic function of the single inter-item correlation; thus, an α of 0.337 implies a weak inter-item correlation of approximately 0.20 between ZAC2 and ZAC3. Composite reliability can nevertheless remain relatively high because it incorporates the indicators estimated outer loadings. Consequently, a high CR based on two weakly correlated indicators does not, by itself, demonstrate adequate measurement quality. Accordingly, while ZAC is reported, its internal consistency is regarded as inadequate rather than merely modest. Any conclusions involving structural relationships with ZAC must therefore be interpreted with considerable caution.

Table 5: Measurement model: indicator loadings, reliability and convergent validity

Construct	Indicator (loading)	α	ρ_A	CR	AVE
Zakat awareness & commitment (ZAC)	ZAC2 (0.839)	0.337	0.352	0.748	0.599
	ZAC3 (0.703)				
Technological innovation (TIN)	TIN1 (0.861)	0.571	0.579	0.823	0.699
	TIN2 (0.810)				
Social entrepreneurship (SEO)	SEO1 (0.615)	0.405	0.527	0.752	0.611
	SEO3 (0.919)				
Perceived sustainable-development impact (ZSD)	ZSD1 (0.811)	0.632	0.632	0.804	0.579
	ZSD2 (0.792)				
	ZSD3 (0.673)				

Note. All outer loadings are significant at $p < 0.001$ (5,000 bootstrap resamples). α = Cronbach's alpha; ρ_A = reliability coefficient rho_A; CR = composite reliability; AVE = average variance extracted.

Discriminant validity is supported by both evaluated criteria. As shown in Table 6, the square root of each construct's AVE exceeds its correlations with all other constructs, satisfying the Fornell–Larcker criterion. Additionally, the HTMT ratios reported in Table 7 all fall below the conservative 0.85 threshold, with the maximum value being 0.812 between TIN and SEO. Although this value remains below the threshold, its proximity to the cut-off warrants caution. Because bootstrap confidence intervals for the HTMT ratios were not obtained, the evidence for discriminant validity relies solely on point estimates. The assessment would be strengthened by reporting these inferential intervals to determine whether they include 1.00.

Table 6: Discriminant validity: Fornell–Larcker criterion

Construct	ZAC	TIN	SEO	ZSD
Zakat awareness & commitment (ZAC)	0.774			
Technological innovation (TIN)	0.225	0.836		
Social entrepreneurship (SEO)	0.183	0.403	0.782	
Perceived sustainable-development impact (ZSD)	0.254	0.334	0.432	0.761

Note. Diagonal elements (in bold) are the square roots of AVE; off-diagonal elements are latent-variable correlations.

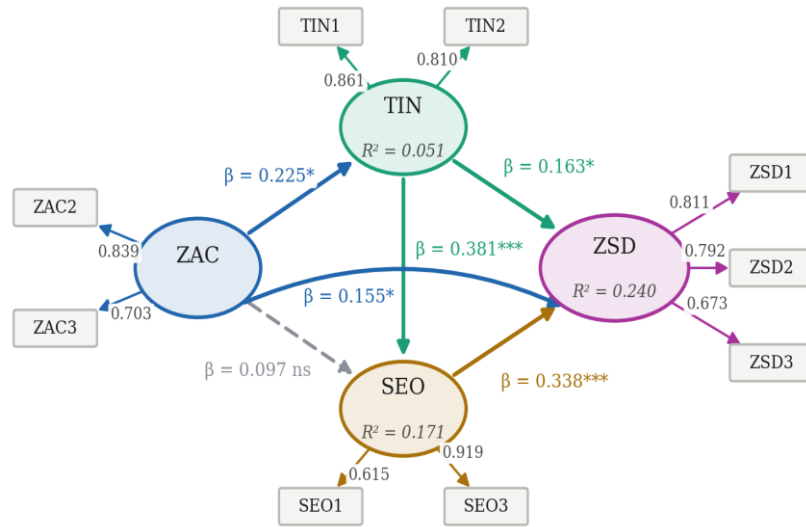
Table 7: Discriminant validity: heterotrait–monotrait ratio (HTMT)

Construct	ZAC	TIN	SEO	ZSD
Zakat awareness & commitment (ZAC)	—			
Technological innovation (TIN)	0.526	—		
Social entrepreneurship (SEO)	0.472	0.812	—	
Perceived sustainable-development impact (ZSD)	0.540	0.546	0.753	—

Note. All ratios fall below the conservative threshold of 0.85. Confidence intervals for HTMT were not obtained; see Section 5.9.

5.3 Structural model

Lateral collinearity is not a concern in this estimation, as the inner variance inflation factor (VIF) values range from 1.00 to 1.23, falling well below the conservative threshold of 3.3. Figure 2 visualises the estimated model, including its measurement component. Figure 3 plots the standardised path coefficients alongside their confidence intervals, and Table 8 details the full structural model results.



*** $p < 0.001$ ** $p < 0.01$ * $p < 0.05$ ns = not significant | Solid arrows: 95% percentile bootstrap CI excludes zero. Dashed arrow: CI includes zero.

Figure 2: Estimated PLS-SEM model, showing both the measurement and the structural components. Rectangles are the retained indicators and ellipses the latent constructs; outer loadings appear beside the indicator arrows, standardised path coefficients beside the inner arrows, and R^2 inside each endogenous construct. Arrows denote hypothesised associations, not causal effects.

Five of the six direct hypotheses are supported. Zakat awareness and commitment is positively associated with perceived technological innovation ($\beta = 0.225$, $SE = 0.109$, $p = 0.039$), supporting **H2**, and with perceived sustainable development impact ($\beta = 0.155$, $SE = 0.070$, $p = 0.028$), supporting **H6**. Its association with social entrepreneurship support is positive but not statistically significant ($\beta = 0.097$, $SE = 0.065$, $p = 0.133$; 95% CI $[-0.026, 0.230]$); therefore, **H1** is not supported. As noted in Section 4, however, an effect of this magnitude may be difficult for the current sample to detect reliably. The two strongest associations involve the constructs proposed in the intermediary pathways: TIN is positively associated with SEO ($\beta = 0.381$, $SE = 0.069$, $p < 0.001$), supporting **H3**, while SEO is positively associated with ZSD ($\beta = 0.338$, $SE = 0.063$, $p < 0.001$), supporting **H5**. Additionally, TIN is directly and positively associated with ZSD ($\beta = 0.163$, $SE = 0.070$, $p = 0.019$), supporting **H4**.

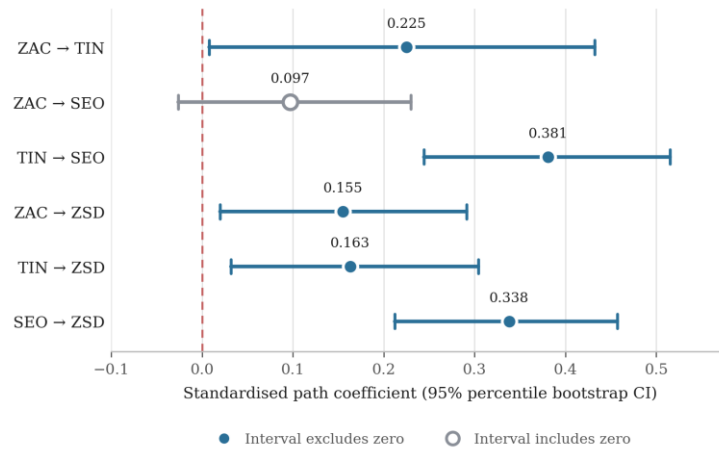


Figure 3: Standardised path estimates with 95 per cent percentile bootstrap confidence intervals (5,000 resamples). Filled markers denote intervals excluding zero and open markers intervals including zero, so significance is encoded by both fill and colour rather than by asterisks. Exact coefficients, standard errors and p -values appear in Table 8.

Table 8: Structural model results: direct effects

H	Path	β	SE	t	p	95% CI (percentile)	f^2	Decision
H1	ZAC → SEO	0.097	0.065	1.50	0.133	[-0.026, 0.230]	0.011	Not supported
H2	ZAC → TIN	0.225	0.109	2.06	0.039	[0.008, 0.432]	0.053	Supported
H3	TIN → SEO	0.381	0.069	5.50	<0.001	[0.244, 0.515]	0.166	Supported
H4	TIN → ZSD	0.163	0.070	2.34	0.019	[0.032, 0.304]	0.029	Supported
H5	SEO → ZSD	0.338	0.063	5.38	<0.001	[0.212, 0.457]	0.124	Supported
H6	ZAC → ZSD	0.155	0.070	2.20	0.028	[0.020, 0.291]	0.030	Supported

Note. β = standardised path coefficient; SE = bootstrap standard error, obtained as β divided by the bootstrap t -statistic; CI = two-sided percentile bootstrap confidence interval (5,000 resamples); f^2 = effect size. The percentile CI is the primary inferential criterion (Section 4.4). Inner VIF values range from 1.00 to 1.23.

Effect sizes across the model are generally modest. Evaluated against the conventional benchmarks of 0.02 (small), 0.15 (medium), and 0.35 (large), only the TIN → SEO path reaches the medium threshold ($f^2 = 0.166$). The SEO → ZSD path falls within the small range ($f^2 = 0.124$), as do all remaining direct associations. Explanatory power is likewise limited. The structural model accounts for 24.0% of the variance in ZSD (adjusted $R^2 = 0.229$) and 17.1% in SEO (adjusted $R^2 = 0.163$), while it explains 5.1% of the variance in TIN (adjusted $R^2 = 0.047$). Following established PLS-SEM practice, we do not test the statistical significance of R^2 or infer practical importance solely from these values. Blindfolding procedures yielded positive Q^2 values for all three endogenous constructs (Table 9). These values indicate cross-validated redundancy within the estimation sample rather than true out-of-sample predictive power. The Q^2 value for TIN (0.029) is particularly small, indicating limited predictive relevance for this construct. A holdout-based PLSpredict analysis.

Table 9: Explanatory power and predictive relevance

Endogenous construct	R^2	Adjusted R^2	Q^2	Interpretation
Technological innovation (TIN)	0.051	0.047	0.029	Weak
Social entrepreneurship (SEO)	0.171	0.163	0.104	Weak to moderate
Perceived sustainable-development impact (ZSD)	0.240	0.229	0.131	Moderate

Note. Adjusted R^2 computed as $1 - (1 - R^2)(n - 1)/(n - k - 1)$, with $n = 218$ and k the number of predictors of each construct. Q^2 obtained by blindfolding with an omission distance of seven and indicates in-sample cross-validated redundancy.

5.4 Mediation Analysis

Specific indirect effects are reported in Table 10 and assessed according to the inferential rule set out in Section 4. H8 is supported under both criteria: social entrepreneurship support mediates the association between technological innovation and perceived sustainable development impact (indirect effect = 0.129, SE = 0.033, $p < 0.001$; 95% CI (0.068, 0.199). Because the direct TIN → ZSD association is also statistically significant, this result indicates complementary partial mediation. H7 and H9 are inconclusive. For H7, the percentile bootstrap interval excludes zero (95% CI (0.003, 0.188), whereas the bootstrap t -statistic does not reach conventional

statistical significance ($t = 1.84, p = 0.066$). The same pattern is observed for the serial mediation path in H9 (95% CI (0.001, 0.065; $t = 1.80, p = 0.072$). In both cases, the lower bound of the percentile interval lies only marginally above zero. We therefore do not adjudicate between the two criteria in favour of the one supporting the hypothesis; rather, we record both results as inconclusive. The divergence between the two inferential criteria may plausibly reflect the asymmetric resampling distributions associated with paths originating from ZAC. As reported in Table 4, the ZAC indicators exhibit substantial negative skewness and pronounced ceiling effects, which may contribute to asymmetry in the corresponding bootstrap product terms. Percentile intervals and bootstrap t -tests can thus yield different conclusions when the underlying bootstrap distribution is highly asymmetric. Bias-corrected and accelerated (BCa) bootstrap intervals may provide a more robust assessment in this context and should be considered in any future re-estimation. The remaining two indirect paths are non-significant under both criteria. The total association between ZAC and ZSD is 0.254, comprising a direct association of 0.155 and combined indirect associations of 0.099. Because a bootstrap confidence interval for the total effect was not obtained, this decomposition should be regarded as descriptive rather than inferential.

Table 10: Specific indirect effects

Indirect path	Effect	SE	t	p	95% CI (percentile)	Inference
ZAC → TIN → SEO (H7)	0.086	0.047	1.84	0.066	[0.003, 0.188]	Inconclusive
TIN → SEO → ZSD (H8)	0.129	0.033	3.86	<0.001	[0.068, 0.199]	Supported (complementary)
ZAC → TIN → SEO → ZSD	0.029	0.016	1.80	0.072	[0.001, 0.065]	Inconclusive
ZAC → TIN → ZSD	0.037	0.027	1.37	0.172	[-0.001, 0.102]	Not supported
ZAC → SEO → ZSD	0.033	0.023	1.44	0.150	[-0.009, 0.082]	Not supported

Note. Effect = standardised specific indirect effect; SE derived as in Table 8; CI = two-sided percentile bootstrap confidence interval (5,000 resamples). "Inconclusive" denotes disagreement between the primary (CI) and secondary (t-based) criteria; see Section 5.4.

5.5 Interpreting the Estimated Associations

The clearest result concerns the position of perceived technological innovation. It is the only construct significantly associated with perceived social-entrepreneurship capacity, while also being directly associated with perceived sustainable-development impact. Viewed through resource orchestration, this pattern is consistent with the proposition that value depends on how resources are structured and leveraged rather than simply on their availability (Sirmon et al., 2011). This interpretation is suggestive rather than confirmatory: the data do not observe resource orchestration directly, and an alternative explanation is equally compatible with the observed associations, namely that respondents who hold favourable views of technology also hold favourable views of enterprise and zakat institutions more generally. Social entrepreneurship is the strongest proximate correlate of perceived sustainable-development impact, and its mediation of the innovation–impact association is the only mediation result supported under both inferential criteria. Of the findings reported here, this is the one that can be defended most readily. It is consistent with the argument that enterprise-based value creation aligns with zakat's developmental purpose (Santos, 2012; Widiastuti et al., 2021), while also indicating that this association is partly indirect.

The pattern surrounding zakat awareness is more equivocal than the earlier framing suggested. Awareness is associated with innovation and, directly, with perceived sustainable-development impact, but shows no statistically significant association with social-entrepreneurship capacity. It is tempting to conclude that awareness reaches enterprise only through innovation, but the evidence does not support this conclusion: the relevant indirect path is inconclusive, while the direct path is not statistically significant rather than demonstrably absent. What can be said more narrowly is that endorsement of zakat is near-universal in this sample and its indicators are severely range-restricted, leaving ZAC with limited variance with which to distinguish respondents. Where almost everyone endorses an institution, endorsement provides limited leverage for explaining differences in other perceptions. Against the streams identified in Table 1, the contribution is one of sequence rather than correction. Whereas the compliance literature treats governance as an antecedent of payment, comparable governance perceptions here also form part of the outcome construct. Enterprise, modelled as an outcome of disbursement in productive-zakat studies, is positioned in this model as an intervening mechanism. Moreover, whereas research on digitalisation often focuses on administrative efficiency, the observed association extends to perceived developmental impact. None of these literatures is overturned by a cross-sectional perception study, and none of these findings should be interpreted as establishing that zakat produces innovation, enterprise or development.

5.6 Theoretical Implications

For Islamic finance scholarship, the paper offers a specified and estimable mechanism where much of the literature has relied on normative assertion, while distinguishing the normative and explanatory roles of its two theoretical resources (Section 3.1). For the social-entrepreneurship literature, it locates enterprise within a faith-based and Shariah-constrained resource system rather than the philanthropic and impact-investment settings more commonly examined in that literature. The most defensible scholarly implication, however, is methodological: the model identifies which links in the proposed chain warrant more rigorous measurement, and the results indicate that the innovation–enterprise–impact segment merits further investigation.

5.7 Institutional and Policy Implications

These implications are propositions for pilot testing rather than prescriptions, and each is limited by the evidence available. The innovation–enterprise segment contains the strongest associations, making it the part of the proposed system where institutional attention may be most worthwhile. The governance perceptions embedded in the outcome construct also suggest that transparency may influence how initiatives are evaluated, rather than merely how they are administered. Any move towards productive deployment must respect the constraints set out in Section 2.1: asnaf eligibility and the ownership requirement take precedence, and a general recommendation to redirect a defined share of collections would not necessarily satisfy these requirements. Section 6.2 sets out the corresponding recommendations, identifying the relevant actor and the measures that could be used to evaluate their effectiveness.

5.8 Societal Implications and Risks

Technology in zakat administration carries risks alongside its potential benefits, and a study that places innovation centrally should acknowledge them. Digital collection and eligibility systems may exclude beneficiaries with limited digital literacy or poor connectivity, including some of the asnaf most in need. Data-intensive verification also raises surveillance and data-protection concerns for populations with limited capacity to challenge how their information is collected and used. Algorithmic eligibility scoring may encode opaque criteria that are difficult to reconcile with the transparency expected in zakat administration. The present sample, being highly educated and digitally connected, is unlikely to capture these costs adequately, which is itself a reason to interpret its favourable assessment of technology cautiously.

5.9 Limitations and Future Research

The limitations are substantial and materially constrain what the paper can claim. Measurement is the most serious. All four constructs rely on two or three coarse ordinal items from an unvalidated instrument; ZAC has inadequate internal consistency ($\alpha = 0.337$) and severely range-restricted indicators, while SEO combines familiarity and willingness, which are related but conceptually distinct dimensions. Structural estimates cannot compensate for these measurement limitations, and the construct labels should therefore be understood as convenient labels for narrow item sets rather than as validated measures. Developing and validating multi-item scales using finer response formats is a precondition for stronger tests of the proposed relationships.

The design is cross-sectional, and all measures are self-reported by the same respondents. Consequently, temporal precedence is not established, and reverse or reciprocal relationships remain plausible. For example, respondents favourably disposed towards social enterprise may rate both technology and zakat institutions more positively, generating the observed pattern without the hypothesised ordering. Common method variance therefore remains a plausible alternative explanation, as discussed in Section 4.5. In addition, the sample is a specialised purposive group rather than a representative population. Additionally, three analyses would materially strengthen a revised study but were not available here: bias-corrected and accelerated bootstrap intervals for the contested indirect paths, HTMT confidence intervals, and a holdout-based PLSpredict assessment benchmarked against a linear model. Beyond these analyses, the more productive next step is not simply a larger perception survey but a different research design: longitudinal or multi-level research linking payer behaviour, institutional digital capability, and *mustahiq* enterprise and welfare outcomes measured through administrative rather than perceptual data.

6. Conclusion and Recommendations

6.1 Conclusion

This paper examined whether zakat awareness and commitment is associated with perceived sustainable-development impact and through which mechanisms. Based on a four-construct model estimated using 218 responses, the results indicate that perceived technological innovation is associated with perceived social-entrepreneurship capacity, while social-entrepreneurship capacity is the strongest correlate of perceived sustainable-development impact and mediates the innovation–impact association. Zakat awareness is also directly associated with the outcome, but evidence that it reaches enterprise indirectly remains inconclusive under the inferential rule adopted. These findings represent associations among stakeholder perceptions at a single point in time, obtained from a specialised sample using a short and imperfectly validated instrument.

They do not demonstrate that zakat produces innovation, enterprise or development. Rather, they identify the innovation–enterprise–impact segment as the part of the proposed chain that most warrants more rigorous measurement and specify what a stronger empirical test would require. This is a modest contribution, but it is one that remains consistent with the evidence.

6.2 Recommendations

The recommendations below are necessarily bounded by the study's evidential limitations. Associations among perceptions at a single point in time cannot establish that an intervention will be effective. The model nevertheless provides a proposed ordering that can inform pilot testing, while making the propositions sufficiently specific to be evaluated empirically. Each recommendation therefore identifies the relevant actor, the evidence motivating it, and the measures that could be used to assess its effectiveness.

First, zakat institutions could prioritise digitising their administrative records before introducing more advanced technological systems. The innovation–enterprise association is the strongest estimated relationship ($\beta = 0.381$), but this finding concerns stakeholder perceptions rather than the effectiveness of any particular platform. The more immediate practical rationale is that without structured and machine-readable records of who received what and when, subsequent interventions are difficult to evaluate. Relevant indicators include the time from application to disbursement, administrative cost per beneficiary reached, and the proportion of disbursements traceable to verified recipients. Second, enterprise support could be piloted within productive allocations already permitted by the relevant jurisdiction rather than through the creation of a new share of collections. As discussed in Section 2.1, asnaf eligibility and the ownership requirement remain fundamental constraints. A defensible pilot could attach incubation, mentoring and market-linkage support to existing productive disbursement, enrol a comparison group receiving disbursement alone, and follow both groups over an appropriate period. Venture survival at 12 and 24 months, recipient income, and exit from assistance would provide relevant outcome measures. Attrition should also be monitored and reported transparently.

Third, regulators could consider requiring a concise disclosure framework that institutions can realistically implement rather than a comprehensive impact framework that may impose disproportionate reporting burdens. Four indicators could provide a useful starting point: total collections, disbursement by asnaf category, the administrative ratio, and median time to disbursement. Given that transparency and stakeholder engagement are embedded in the perceived outcome construct, these indicators could provide a practical basis for external assessment of institutional performance. Fourth, digitisation initiatives should retain a non-digital access route and monitor its use. Beneficiaries least able to complete online eligibility procedures may include some of those whom zakat institutions are intended to serve. Institutions could therefore report the proportion of recipients served through assisted or offline channels and monitor changes in this proportion as a potential inclusion indicator. The broader risks associated with digitalisation are discussed in Section 5.8. Finally, the principal priority for future research should be measurement. A shared multi-item instrument using finer response formats would provide a stronger foundation for the literature than another cross-sectional model based on two-item constructs. Where feasible, institutions could also facilitate access to anonymised administrative records covering disbursement, follow-up and enterprise status, allowing the proposed chain to be tested against observed outcomes rather than perceptions. Future research could consequently build on the present conceptual model while substantially improving its measurement and empirical design.

These recommendations are unlikely to be implemented quickly, and institutional capacity is an important constraint. Administrative budgets may be limited by statutory or institutional arrangements, while existing staff and systems already operate under resource constraints. This reinforces the value of treating the recommendations as incremental, evaluable interventions rather than comprehensive reform programmes. A modest pilot that generates credible evidence may ultimately provide greater value to the field than an ambitious programme whose effects cannot be adequately evaluated.

Declaration

Declaration of generative AI. A generative artificial-intelligence assistant was used to support the computational implementation of the estimation and bootstrapping routines, the preparation of tables and figures, and language editing. It was not used to design the research, collect data, or generate or alter any data, result or citation. All reported statistics were re-computed and verified against the source dataset by the authors, who take sole responsibility for the accuracy and integrity of the content.

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Appendix A. Retained Measurement Items

The items below were retained after purification. Items ZAC1, SEO2 and ZSD4 were removed under the criterion stated in Section 4.3; their full wording appears in the original questionnaire supplied as supplementary material.

Table A1: Retained constructs and measurement items

Code	Item	Response scale
ZAC2	Do you believe that zakat funds can play a significant role in promoting economic development and social welfare?	No (1) – Maybe (2) – Yes (3)
ZAC3	Do you think there should be more educational programmes and outreach efforts to promote zakat awareness?	No (1) – Maybe (2) – Yes (3)
TIN1	How important are innovation and technology for the success of social-entrepreneurship ventures?	Not important (1) – Somewhat (2) – Very important (3)
TIN2	How important is innovation for the success of social-entrepreneurship ventures?	Not important (1) – Somewhat (2) – Very important (3)
SEO1	How familiar are you with the concept of social entrepreneurship?	Not familiar (1) – Somewhat (2) – Very familiar (3)
SEO3	How likely are you to support social-entrepreneurship initiatives in your community?	Unlikely (1) – Neutral (2) – Likely (3) – Very likely (4)
ZSD1	How effective are zakat-funded initiatives in fostering social entrepreneurship and innovation?	Not effective (1) – Somewhat (2) – Very effective (3)
ZSD2	How sustainable are zakat-funded initiatives in addressing long-term welfare and development needs?	Not (1) – Somewhat (2) – Sustainable (3) – Very (4)
ZSD3	How crucial are stakeholder engagement and collaboration for the success of zakat-funded initiatives?	Not crucial (1) – Somewhat (2) – Crucial (3) – Very (4)

Note. ZAC = zakat awareness and commitment; TIN = technological innovation; SEO = social entrepreneurship; ZSD = perceived sustainable-development impact.



Assessing Changes In *Mustahik* Welfare Following A Productive *Zakat* Programme: A Cibest-Based Evaluation Of The Madrasah Bisnis Al-Aqsha Programme

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Abstract

This study evaluates changes in the material and spiritual welfare of beneficiaries (*mustahik*) participating in the Madrasah Bisnis Al-Aqsha (MBA) programme, administered by LAZ Al-Aqsha De Latinos in South Tangerang City, Indonesia. As an instrument of Islamic social finance, productive zakat provides working capital, business equipment, and mentorship to empower micro-entrepreneurs and foster greater economic independence. Employing a survey design, this study examines 57 *mustahik* households that had actively participated in the MBA programme and received productive zakat assistance for at least one year. Using the Center for Islamic Business and Economic Studies (CIBEST) model, the findings demonstrate statistically significant improvements in the material and spiritual welfare indices of participating households following their participation in the programme. Furthermore, the findings indicate that the programme contributes to the objectives of Sustainable Development Goal (SDG) 1 (No Poverty) in Banten Province, including South Tangerang City. These results underscore the important role of professional zakat management in supporting targeted socio-economic empowerment and poverty alleviation. Overall, the study highlights the potential of productive zakat as an institutional mechanism for supporting sustainable economic development and offers policy insights for zakat management organisations (*amil*) at the local and national levels.

Keywords: Productive zakat; CIBEST model; mustahik welfare; poverty alleviation; Islamic social finance; Sustainable Development Goals (SDGs)

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1. Introduction

Islamic Social Finance constitutes an important mechanism for promoting the equitable distribution of wealth through zakat, waqf, and sadaqah, thereby enhancing public welfare (Herianingrum et al., 2024). Globally, it has gained recognition as a financial model with the potential to mitigate economic inequality and support sustainable social development (Ayuniyyah & Hafidhuddin, 2020). Productive zakat differs from consumptive zakat by focusing more directly on long-term economic empowerment. Rather than providing only short-term relief, it provides *mustahik* (beneficiaries) with working capital and productive assets to foster greater economic independence (Asfarina et al., 2019; Razak et al., 2024). By channelling funds into micro-enterprises and income-generating activities, productive zakat can help vulnerable households break the cycle of poverty (Mustari et al., 2024; Sutrisno & Haron, 2020).

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In Indonesia, zakat is deeply embedded in the socioeconomic fabric; however, its institutional management requires further optimisation to realise its full potential for productive economic development (Mustari et al., 2024; Setiawan, 2024). Despite the substantial potential associated with the country's large Muslim population, structural challenges remain in establishing efficient mechanisms for the optimal collection, allocation, and monitoring of zakat funds (Febriyanti, 2021; Shalahuddin Zakiy, 2020). Banten Province, particularly South Tangerang City, possesses considerable potential for productive zakat development, supported by growing public awareness of its role in local economic empowerment (Faisal et al., 2023; Rizal et al., 2023). This momentum is further supported by increasing zakat literacy and the involvement of local zakat institutions in promoting productive zakat as an instrument of economic empowerment (Al-Taani et al., 2024; Ramadhita et al., 2022). Furthermore, the development of productive zakat is consistent with the objectives of Maqasid al-Shariah, particularly those related to the protection of wealth (Hifz al-Mal) and the fulfilment of basic human needs (Wibisono et al., 2019). The socioeconomic landscape of Banten Province underscores the importance of addressing poverty and employment vulnerability. Table 1 presents the distribution of the poor population across regencies and municipalities in Banten Province in 2025.

Table 1. Number of Poor Population 2025

Regency/Municipality	Poor Population (Thousand)
Pandeglang Regency	105.35
Lebak Regency	106.52
Tangerang Regency	265.90
Serang Regency	68.51
Tangerang City	124.76
Cilegon City	16.05
Serang City	41.07
South Tangerang City	44.61
Banten Province	772.78

Source: [Statistics Indonesia Banten Province \(2025\)](#)

Despite regional development initiatives, poverty remains a significant challenge in several areas of Banten Province, with Tangerang Regency recording the highest number of poor residents (265.90 thousand). This situation highlights the need for sustainable poverty alleviation strategies that extend beyond short-term financial assistance. In this context, productive *zakat* can function as an important Islamic Social Finance instrument by providing productive capital and supporting income-generating activities. As illustrated in Table 1, the poverty profile highlights the socioeconomic challenges faced by communities across Banten Province. Labour market indicators provide additional context regarding these socioeconomic vulnerabilities. As shown in Table 2, Banten Province recorded a total labour force of 6.17 million persons in 2025, of whom 5.76 million were employed. Although formal employment accounted for more than half of total employment (54.88%), the Open Unemployment Rate (OUR) remained at 6.69 per cent..

Table 2. Labor Force and Employment Indicators in Banten Province

Indicator	Data
Labor Force	6.17 million persons
Employed Population	5.76 million persons

Indicator	Data
Sector with the Largest Employment Increase	Other Service Activities
Formal Employment	3.16 million persons (54.88%)
Open Unemployment Rate (OUR)	6.69%

Source: [National Labor Force Survey \(Sakernas\) \(August, 2025\)](#)

These indicators suggest that, despite substantial labour market participation, a significant segment of the population may remain vulnerable to employment and income instability. In this context, productive zakat can serve as a complementary mechanism for poverty alleviation by supporting micro-enterprises and generating sustainable income opportunities for low-income households. Nevertheless, empirical evidence on how community-based productive zakat programmes contribute to household welfare and economic resilience, particularly in urban settings such as South Tangerang, remains limited. More broadly, maximising the potential of productive zakat requires a multidimensional approach involving collaboration among government agencies, the private sector, and zakat management organisations (amil) ([Widiastuti et al., 2021](#)). The Madrasah Bisnis Al-Aqsha (MBA) is a flagship economic empowerment programme initiated by LAZ Al-Aqsha De Latinos in South Tangerang City. Designed to utilise productive zakat, the MBA programme focuses on promoting greater economic independence among mustahik. The programme provides structured business training, technical mentorship, and seed capital assistance to support the establishment and development of micro-enterprises, thereby reducing reliance on consumptive forms of social assistance ([Hamidi et al., 2022](#); [Putri et al., 2019](#)). Such programmes also reflect the potential role of productive zakat in supporting broader sustainable development objectives ([Ridwan et al., 2019](#)).

However, evaluating the effectiveness of productive zakat requires measures that extend beyond conventional indicators such as income and employment status. A more comprehensive assessment should capture multidimensional changes in household welfare. Accordingly, this study employs the Center for Islamic Business and Economic Studies (CIBEST) Model, which integrates material and spiritual dimensions of welfare into a unified analytical framework ([Beik & Arsyianti, 2015, 2016](#)). Despite the growing literature on productive zakat, several important gaps remain. First, many empirical studies employ cross-sectional designs, providing limited evidence on changes in household welfare following participation in productive zakat programmes. Second, evaluations of entrepreneurship-oriented zakat initiatives administered by local, community-based institutions remain relatively limited. Third, few studies integrate the Had Kifayah minimum adequacy standard with the CIBEST Model to evaluate multidimensional changes in household welfare. Addressing these gaps, this study evaluates changes in the material and spiritual welfare of mustahik households before and after their participation in the Madrasah Bisnis Al-Aqsha productive zakat programme. Accordingly, this study provides a contextual evaluation of changes in the welfare of mustahik participating in the productive zakat programme administered by LAZ Al-Aqsha De Latinos. By applying the CIBEST Model within an urban Indonesian setting, the study contributes to the literature on Islamic Social Finance and provides practical insights for zakat management organisations seeking to strengthen community-based economic empowerment programmes. More broadly, the findings may contribute to understanding how productive zakat can support economic inclusion and welfare improvement among economically vulnerable households.

2. Literature Review

2.1 Productive Zakat and Sustainable Welfare

Zakat is a central component of Islamic social finance that serves not only as a mechanism for wealth redistribution but also as a catalyst for sustainable welfare enhancement. Within the Islamic economic framework, welfare encompasses material sufficiency alongside social equity and spiritual well-being (falah). Consequently, zakat is increasingly recognized as a vital complementary instrument for poverty alleviation and human capital development, particularly in Muslim-majority nations such as Indonesia. Previous empirical literature highlights its capacity to mitigate poverty and income inequality when managed professionally and directed toward empowering beneficiaries rather than dispensing temporary social assistance ([Choiriyah et al.,](#)

2020; Ridwan et al., 2019; Widiastuti et al., 2018). The academic discourse on zakat has gradually shifted from evaluating initial fund disbursement metrics to tracking long-term shifts in beneficiary welfare. Early studies focused primarily on immediate income supplementation and short-term consumption support, reflecting zakat's traditional role as a social safety net (Rahmawati & Septiarini, 2021; Soleh, 2019). Modern scholarship, however, demonstrates that productive zakat initiatives—when coupled with entrepreneurship training, financial literacy, and technical mentoring—generate sustainable improvements in household resilience and financial independence (Asfarina et al., 2019; Yusuf, 2025). This evolution has driven the adoption of multi-dimensional evaluation frameworks across Islamic social finance.

2.2 The CIBEST Model as a Multidimensional Welfare Framework

To evaluate welfare within Islamic social finance, Beik and Arsyianti (2015, 2016) developed the Center of Islamic Business and Economic Studies (CIBEST) Model. The framework assesses household welfare across dual material and spiritual dimensions, categorizing households into four distinct quadrants: Welfare, Material Poverty, Spiritual Poverty, and Absolute Poverty. Its primary methodological advantage lies in tracking structural transitions in household welfare status rather than assessing changes in mean household income alone. Empirical evidence suggests that productive *zakat* interventions yield optimal outcomes when financial capital is paired with continuous spiritual development, demonstrating that spiritual well-being reinforces material economic progress (Ayuniyyah et al., 2022; Hudaefi et al., 2025). Subsequent applications across Islamic microfinance, productive *zakat*, and community-based empowerment models further confirm the multidimensional nature of Islamic welfare (Bintania et al., 2024; Widiastuti et al., 2021). Despite its widespread application, two methodological considerations inherent in the CIBEST Model require attention. First, the material dimension is highly sensitive to the selected poverty line; thus, integrating a localized *Had Kifayah* (minimum adequacy standard) threshold is essential for generating contextually accurate baseline metrics. Second, the spiritual dimension relies on self-reported religious observances and perceptions, which may be susceptible to subjective reporting and social desirability bias. Nevertheless, the CIBEST framework remains uniquely valuable because it conceptualizes welfare as a dynamic interaction between economic capacity and spiritual fulfillment rather than treating poverty strictly as material deprivation.

Alternative multidimensional poverty tools, most notably the Alkire–Foster Multidimensional Poverty Index (MPI), evaluate deprivation across education, health, and living standards. However, conventional MPI models omit spiritual parameters essential to the Islamic concept of welfare (*falah*). In contrast, the CIBEST Model explicitly integrates material and spiritual indicators, enabling researchers to determine whether economic gains align with spiritual growth. This makes CIBEST particularly suited for evaluating productive *zakat* programs, whose mandate extends beyond basic income generation to the holistic empowerment of *mustahik* households. This multidimensional perspective is equally vital when examining vulnerable demographics such as orphans and micro-entrepreneurs, who experience overlapping deprivations extending beyond financial hardship to include educational and psychosocial barriers. Prior research indicates that investing in human capital, technical education, and character development mitigates intergenerational poverty (Irmadariyani et al., 2024). In *zakat* management, structured educational and business mentoring programs strengthen long-term household self-reliance (Arsad, 2025).

Productive *zakat* fundamentally aims to transition *mustahik* from passive social aid recipients into self-sustaining business owners. Unlike consumptive *zakat*, which addresses immediate physiological needs, productive *zakat* expands micro-enterprise capacity through capital injection, skill enhancement, and continuous operational support. This intervention is critical in urban centers like South Tangerang, where market opportunities exist but low-income households lack access to seed capital. Evaluating productive *zakat* requires a framework capable of capturing both material progress and spiritual resilience. Table 3 presents a comparative summary of the structural differences between the CIBEST Model and the conventional Multidimensional Poverty Index (MPI).

Table 3. Comparison Between the CIBEST Model and the Multidimensional Poverty Index (MPI)

Aspect	CIBEST Model	MPI
Material welfare	✓	✓
Spiritual welfare	✓	✗
Islamic worldview	✓	✗

Aspect	CIBEST Model	MPI
Education dimension	Partial	✓
Health dimension	Partial	✓
Living standard	✓	✓
Household welfare classification	Four CIBEST quadrants	Multidimensional deprivation score
Primary objective	Holistic welfare (falah)	Human development and deprivation

Source: Adapted from [Beik and Arsyianti \(2015, 2016\)](#) and the Alkire–Foster MPI framework.

The comparison indicates that the MPI provides a broader assessment of deprivation in areas such as education and health from a conventional human development perspective. In contrast, CIBEST provides an Islamic economic perspective by integrating material and spiritual dimensions of welfare. Consequently, the CIBEST Model is particularly relevant to the assessment of productive *zakat*, as its conceptual dimensions are aligned with the broader objectives of *Maqasid al-Shariah* and the empowerment of *mustahik* households.

3. Conceptual Framework

The present study assesses changes in the welfare of mustahik households using the CIBEST (Center of Islamic Business and Economic Studies) Model developed by [Beik and Arsyianti \(2015, 2016\)](#). The model provides a multidimensional approach to assessing welfare and poverty from an Islamic perspective. Unlike conventional poverty measures that primarily focus on material deprivation, the CIBEST Model incorporates both material and spiritual dimensions, reflecting the Islamic conception of welfare as encompassing economic sufficiency as well as religious and spiritual well-being. The CIBEST Model evaluates welfare through two complementary dimensions: material welfare and spiritual welfare. Following the Had Kifayah framework developed by BAZNAS, the material dimension reflects the household's ability to achieve minimum living sufficiency. The spiritual dimension, meanwhile, assesses religious practices and the household's supporting social environment. The operational definitions of the variables used in this study are presented in Tables 4 and 5.

Table 4. Operational Definition of Material Welfare Variables

Indicator	Operational Measurement
Income	Monthly household income (IDR/month)
Economic sufficiency	Ability to fulfil essential household needs (Likert 1–5)
Number of family members	Total household members financially supported
Had Kifayah status	Above or below the BAZNAS Had Kifayah threshold
Household assets	Ownership of productive and non-productive assets

Source: Adapted from the Had Kifayah Framework of [Puskas BAZNAS \(2024\)](#).

Table 5. Operational Definition of Spiritual Welfare Variables

Indicator	Scale
Prayer	1–5
Fasting	1–5
Zakat and Infaq	1–5
Family religious environment	1–5
Government/social support	1–5

Source: Adapted from the CIBEST Model of [Beik and Arsyianti \(2015, 2016\)](#).

Within this context, the CIBEST Model has become an established framework for assessing welfare in Islamic social finance. The model is based on the premise that poverty cannot be adequately explained by material conditions alone and that spiritual needs constitute an important component of human welfare. Drawing on the *Maqasid al-Shariah* framework, Beik and Arsyianti conceptualise welfare as a combination of material sufficiency and spiritual fulfilment at the household level, making the household, rather than the individual,

the primary unit of analysis. The CIBEST framework classifies households into four quadrants according to their ability to satisfy material and spiritual needs simultaneously. Material welfare is determined by comparing household income with the Material Value (MV), while spiritual welfare is assessed using the Spiritual Value (SV). The material poverty threshold is expressed as:

$$\sum_{i=1}^n P_i M_i$$

where P_i represents the price of each basic necessity and M_i denotes the minimum quantity required to satisfy household needs. Meanwhile, the spiritual poverty threshold is set at $SV = 3$, based on the average score of five spiritual indicators measured using a five-point Likert scale: prayer, fasting, *zakat* and *infaq*, the household environment, and the government policy environment. Households with a spiritual score below this threshold are categorised as spiritually poor. Based on these two thresholds, households are classified into four welfare categories: Quadrant I (Welfare), Quadrant II (Material Poverty), Quadrant III (Spiritual Poverty), and Quadrant IV (Absolute Poverty). The model subsequently generates four indices representing the proportion of households in each quadrant:

$$W = \frac{w}{N}, P_m = \frac{mp}{N}, P_s = \frac{sp}{N}, P_a = \frac{ap}{N}.$$

where W denotes the Welfare Index, P_m the Material Poverty Index, P_s the Spiritual Poverty Index, and P_a the Absolute Poverty Index. The variables w , mp , sp , and ap represent the numbers of households in the welfare, material poverty, spiritual poverty, and absolute poverty quadrants, respectively, while N denotes the total number of observed households. Together, these four indices satisfy the identity:

$$W + P_m + P_s + P_a = 1.00$$

Unlike conventional poverty indicators that rely primarily on income, the CIBEST Model captures the interaction between material capability and spiritual well-being, enabling researchers to examine changes in household welfare across both dimensions. Previous empirical studies have reported increases in the Welfare Index and reductions in the Material Poverty Index following productive *zakat* interventions, although the magnitude and sustainability of these changes may vary according to programme design and beneficiary characteristics.

Table 6. Material Welfare Indicators Based on the Had Kifayah Framework

Dimension	Indicator
Food	Ability to meet minimum household food requirements
Clothing	Ability to provide basic clothing needs
Housing and Household Facilities	Adequacy of housing, electricity, water, and household utilities
Worship	Availability of basic facilities supporting religious obligations
Education	Ability to finance essential educational needs
Health	Ability to access basic healthcare services
Transportation	Ability to meet minimum transportation needs for daily activities

Source: Puskas BAZNAS (2024)

Following the *Had Kifayah* framework, the material dimension in this study was operationalised through measurable indicators reflecting the economic conditions of beneficiary households. This operationalisation was intended to translate the multidimensional concept of *Had Kifayah* into variables that could be consistently assessed through household surveys while remaining aligned with the objectives of the CIBEST Model. Rather than relying solely on household income, the assessment also considered household characteristics, economic capacity, and asset ownership, thereby providing a broader representation of material welfare. To assess the consistency of the measurement instrument, the questionnaire was evaluated through validity and reliability

procedures prior to the main analysis. Content validity was established through expert review involving scholars in Islamic economics and *zakat* management to assess whether the indicators adequately represented the intended dimensions of material and spiritual welfare within the CIBEST framework. Subsequently, internal consistency reliability was assessed using Cronbach's alpha, with a minimum acceptable threshold of 0.70 commonly adopted in social science research.

Table 7. Reliability Test Results

Variable	Number of Items	Cronbach's Alpha
Material welfare	5	0.842
Spiritual welfare	5	0.891

The reliability results indicate that both constructs exceeded the commonly accepted threshold of 0.70, suggesting satisfactory internal consistency. The material welfare construct achieved a Cronbach's alpha of 0.842, while the spiritual welfare construct achieved a value of 0.891. These results indicate that the items used to measure the two constructs demonstrated a satisfactory degree of internal consistency among the surveyed *mustahik* households.

4. Research Methodology

This study employed a total population sampling (census) approach, in which all eligible beneficiaries of the Madrasah Bisnis Al-Aqsha (MBA) productive *zakat* programme were included as research participants. Rather than selecting a subset of respondents, the census approach was adopted because the total number of beneficiaries was relatively small and fully accessible for data collection, enabling the study to capture the characteristics of the entire target population. This study employed a baseline–endline quantitative evaluation design to assess changes in the welfare of *mustahik* households participating in the Madrasah Bisnis Al-Aqsha (MBA) productive *zakat* programme. The evaluation followed the same group of beneficiaries throughout a one-year entrepreneurial mentoring period, enabling comparisons of household conditions before and after programme participation. Welfare was assessed using the CIBEST Model, which integrates material and spiritual dimensions to measure multidimensional changes in household well-being. The overall research workflow is illustrated in Figure 1.

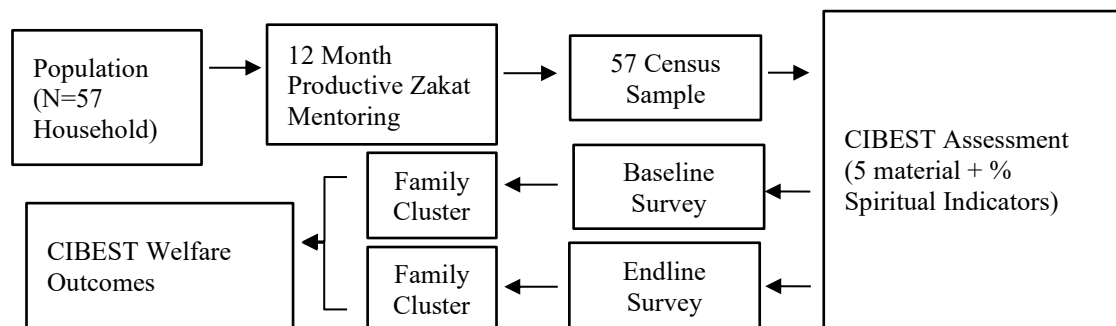


Figure 1. Research Process of Al-Aqsha Business Madrasah (Result Method)

As illustrated in Figure 1, the study began with a census of 57 beneficiaries enrolled in the Madrasah Bisnis Al-Aqsha programme. All participants received productive *zakat* assistance in the form of business capital, entrepreneurship coaching, and continuous mentoring over a one-year period. Household welfare was subsequently measured at two observation points: baseline, conducted before the programme, and endline, conducted after the programme, using five material indicators derived from the *Had Kifayah* framework and five spiritual indicators adopted from the CIBEST Model. The resulting scores were then classified into four welfare quadrants, producing the Welfare Index, Material Poverty Index, Spiritual Poverty Index, and Absolute Poverty Index. To evaluate changes in household welfare over time, this study adopted a baseline–endline research design. Data collection was conducted at two observation points, enabling the welfare conditions of

the same beneficiaries to be compared before and after their participation in the productive *zakat* programme. The sequence of research activities is presented in Table 8.

Table 8. Research Timeline

Research Stage	Period
Baseline household survey	February 2025
Distribution of productive zakat	March 2025
Business mentoring and entrepreneurship training	March–December 2025
Endline household survey	February 2026
Data analysis and CIBEST evaluation	March 2026

The study involved 57 *mustahik* households that had received productive *zakat* assistance and participated in the entrepreneurial empowerment programme for a minimum of one year. To ensure consistency in evaluating changes in programme-related welfare outcomes, respondents were required to meet three eligibility criteria: (1) being registered as active MBA beneficiaries; (2) continuously participating in business mentoring activities; and (3) completing both the baseline and endline welfare assessments. Consequently, the final sample comprised the entire eligible study population ($N = 57$), avoiding sampling error within the defined eligible population (Setiawan, 2024; Sutrisno & Haron, 2020). Because the productive *zakat* programme implemented by Madrasah Bisnis Al-Aqsha involved a relatively small and well-defined group of beneficiaries, this study adopted a total population sampling (census) approach. Accordingly, every eligible beneficiary was included in the analysis, allowing the study to capture the characteristics of the entire group of programme participants without sampling selection within the defined population. The population and sampling characteristics of the respondents are summarised in Table 9.

Table 9. Population and Sampling Characteristics

Item	Description
Study population	Madrasah Bisnis Al-Aqsha beneficiaries
Sampling technique	Total population sampling (Census)
Total population	57 households
Final sample	57 households
Response rate	100%
Unit of analysis	Mustahik household

Descriptive statistics were used to provide an overview of the data distribution, while inferential statistical techniques were employed to assess whether changes between the baseline and endline measurements were statistically significant. Furthermore, a paired-samples *t*-test was employed to compare the mean values of the selected welfare indicators before and after participation in the productive *zakat* programme. This analysis enabled the study to assess changes in the economic well-being and independence of participating households over the observation period. Prior to conducting the paired-samples *t*-test, the normality of the paired differences was assessed using the Shapiro–Wilk test. This procedure was used to assess whether the distribution of score differences between the baseline and endline measurements was consistent with the normality assumption required for parametric analysis. Given the sample size of 57 households, the Shapiro–Wilk test was considered appropriate for assessing the distributional characteristics of the paired differences.

Table 10. Shapiro–Wilk Normality Test for Paired Differences

Variable	Shapiro–Wilk (W)	p-value	Decision
Income	0.978	0.214	Normal
Economic Sufficiency	0.971	0.108	Normal
Household Assets	0.983	0.286	Normal
Spiritual Welfare Score	0.982	0.327	Normal

The results presented in Table 10 indicate that all variables produced p-values greater than .05, suggesting insufficient evidence to reject the assumption of normality for the paired differences. The highest Shapiro–Wilk statistic was observed for household asset value ($W = 0.983$), while economic sufficiency recorded the lowest value ($W = 0.971$). These results support the normality assumption required for the application of the paired-samples t-test to assess changes in *mustahik* welfare following participation in the productive *zakat* programme. Ethical approval was obtained from the Research Ethics Committee of Universitas Bhakti Asih Tangerang. Written informed consent was obtained from all participants prior to the survey, and all responses were anonymised for research purposes.

5. Results and Discussion

Table 6 presents the gender composition of the respondents included in the study. Understanding the demographic profile of the respondents provides useful context for interpreting the findings. The data indicate that female respondents constitute the majority of the sample, suggesting a higher level of participation among women in the productive *zakat* empowerment programme examined in this study. This distribution provides an overview of the demographic characteristics of the beneficiaries and establishes a basis for the subsequent analysis.

Table 11. Gender Distribution		
Gender	Sum	Percentage
Man	15	26%
Woman	42	74%
Total	57	100%

Source: Author's work

Table 6 shows the gender distribution of the 57 respondents participating in the Al-Aqsha Business Madrasah (MBA) programme. Of the total respondents, 15 (26%) were men, while 42 (74%) were women. Thus, women constituted the majority of respondents participating in the MBA productive zakat programme.

Table 12. Comparison of Spiritual Indicators			
Spiritual Indicators	Before	After	Status
Prayer	4.3	4.5	Increase
Fast	4.4	4.5	Increase
Zakat & infak	4.4	4.6	Increase
Family environment	4.6	4.8	Increase
Government Policy	4.6	4.8	Increase

Source: Author's work

Table 7 illustrates the changes in the values of the spiritual indicators, including prayer, fasting, zakat and infak, family religious environment, and government policies. For example, the mean value for prayer increased from 4.3 before the programme to 4.5 after the programme. The other indicators also showed increases, indicating an overall improvement in the measured spiritual welfare indicators among MBA participants following their participation in the productive zakat programme.

Table 13. Comparison of Material Indicators			
Material Indicator	Before	After	Status
Income	2.4	2.7	Increase
Economic Sufficiency	2.6	2.8	Increase

Material Indicator	Before	After	Status
Number of Family Members	2.9	2.9	Stable
Poverty Line Standards	3.0	3.1	Increase
Assets & Assets	1.4	1.5	Increase

Source: Author's work

Table 8 presents the material indicators, including income, economic sufficiency, number of household members, Had Kifayah standards, and household assets. Overall, most of the material indicators increased between the baseline and endline measurements. For example, the mean income score increased from 2.4 to 2.7, while the economic sufficiency score increased from 2.6 to 2.8 following participation in the productive zakat programme. These changes indicate an improvement in the measured material welfare conditions of the participating households.

Table 14. Additional Material Indicators

Material Indicator	Before	After	Status
Average	IDR 3,377,777	IDR 3,666,667	Increased
Median	IDR 4,000,000	IDR 5,000,000	Increase
Minimum	IDR 3,000,000	IDR 3,000,000	Stable
Maximum	IDR 5,000,000	IDR 5,000,000	Stable

Source: Author's work

This table compares additional material indicators such as average income, median, minimum, and maximum before and after the program. Although the average income decreased slightly, the median income increased from IDR 4,000,000 to IDR 5,000,000. This shows an increase in welfare at the median level, although not all respondents experienced the same increase in income.

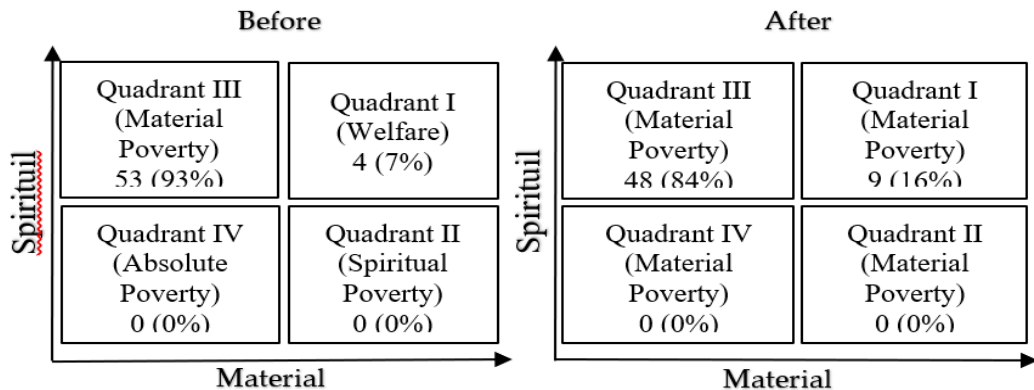


Figure 2. CIBEST Quadrant Before and After Programs

The CIBEST quadrant model is a tool for assessing household welfare by considering both spiritual and material dimensions (Beik & Arsyianti, 2015, 2016). Before the implementation of the programme, most households were classified in Quadrant II, representing material poverty, with 93% (53 households) experiencing material poverty. Only 7% (4 households) were classified in Quadrant I, representing welfare in both the spiritual and material dimensions. No households were classified in Quadrants III or IV, representing spiritual poverty and absolute poverty, respectively. This baseline assessment indicates that the majority of households faced substantial material welfare challenges prior to participating in the programme. While the CIBEST quadrant analysis illustrates the overall distribution of household welfare before and after the productive *zakat* programme, it does not show how individual households moved between welfare categories. To provide a more comprehensive assessment, a Household Welfare Transition Matrix was constructed by tracking each of the 57 beneficiary households across the four CIBEST quadrants. This matrix identifies the

direction and extent of welfare mobility, providing a more detailed assessment of changes in the material and spiritual dimensions of household welfare following participation in the programme.

Table 15. Household Welfare Transition Matrix

Before / After	Welfare	Material Poverty	Spiritual Poverty	Absolute Poverty
Welfare	15	0	0	0
Material Poverty	18	9	0	0
Spiritual Poverty	4	5	2	0
Absolute Poverty	0	2	2	0

Source: Authors' calculation based on the CIBEST household transition analysis.

Table 15 demonstrates a clear upward transition in household welfare following the productive zakat program. Among the households initially classified as materially poor, 18 successfully moved into the welfare quadrant, while 9 remained in material poverty. Similarly, four households initially experiencing spiritual poverty moved into the welfare category, while five transitioned to material sufficiency. Notably, no household remained in the absolute poverty quadrant at the endline measurement. These transition patterns complement the descriptive findings of the CIBEST analysis by illustrating household-level welfare mobility rather than changes in aggregate percentages alone.

Following one year of support through the productive *zakat* programme, improvements in household welfare were observed. The distribution of households across the CIBEST quadrants changed, with an increase in the number of households achieving welfare. At the endline measurement, 16% of households (9 households) were classified in Quadrant I, indicating welfare in both the spiritual and material dimensions. Meanwhile, the majority of households (84%) remained in Quadrant II, representing material poverty. This distribution reflects an increase of 9 percentage points in the proportion of households classified in Quadrant I, from 7% at baseline to 16% at endline. Although the shift was relatively modest, it indicates an improvement in the observed welfare status of some participating households over the study period.

To determine whether the observed changes in welfare indicators were statistically significant, a paired-samples *t*-test was conducted to compare household conditions before and after participation in the productive *zakat* programme. In addition to statistical significance, Cohen's *d* was reported as an effect size measure to assess the magnitude of the observed changes. According to Cohen (1988), effect size values of 0.20, 0.50, and 0.80 are commonly interpreted as small, medium, and large effects, respectively.

Table 16. Paired Sample t-test Results for Material Welfare Indicators

Material Indicator	Before	After	Mean Difference	t-value	p-value	Cohen's d
Income	2.40	2.70	0.30	5.812	<0.001	0.77
Economic Sufficiency	2.60	2.80	0.20	4.376	<0.001	0.58
Number of Family Members	2.90	2.90	0.00	0.000	1.000	0.00
Had Kifayah Status	3.00	3.10	0.10	2.684	0.010	0.36
Household Assets	1.40	1.50	0.10	2.453	0.017	0.33

Source: Authors' calculation using paired sample t-test.

The paired-samples *t*-test results indicate statistically significant changes in most of the measured material welfare indicators following participation in the productive *zakat* programme. Household income exhibited the largest practical effect, with Cohen's *d* = 0.77, representing a moderate-to-large effect. Economic sufficiency also demonstrated a meaningful effect, with Cohen's *d* = 0.58, indicating a moderate change in beneficiaries' ability to meet their essential household needs. In contrast, the number of household members showed no

statistically significant difference, which is expected because household size represents a demographic characteristic rather than a direct programme outcome. Overall, the combination of statistically significant changes and moderate effect sizes provides evidence of measurable improvements in selected dimensions of household material welfare over the study period.

Overall, the findings indicate that the productive *zakat* programme implemented by MBA was associated with improvements in both the spiritual and material dimensions of household welfare. Although a substantial proportion of households remained in Quadrant II, the movement of several households into Quadrant I indicates an improvement in their observed welfare status. These findings highlight the potential of productive *zakat* to support greater economic independence and welfare among *mustahik* (*zakat* recipients). The results further suggest that sustained support, business mentoring, and guidance may provide opportunities for more households to progress towards higher levels of welfare. This reinforces the role of *zakat* as an important instrument for supporting social and economic development (Ayuniyyah & Hafidhuddin, 2020).

5.1. Material Welfare Improvement

The findings indicate that participation in the productive *zakat* programme was associated with meaningful improvements in the material welfare of participating *mustahik* households. Rather than providing only temporary financial assistance, the programme combined business capital with continuous entrepreneurial mentoring, supporting beneficiaries in strengthening their income-generating capacity. This pattern is consistent with the argument of Ayuniyyah et al. (2022) that productive *zakat* may generate more sustainable welfare outcomes when financial support is integrated with capacity-building interventions. The findings therefore suggest that entrepreneurship-oriented *zakat* programmes have the potential to support longer-term household economic resilience rather than short-term consumption alone (Hamid et al., 2024; Mustari et al., 2024; Widiastuti et al., 2022, 2024). The improvement in economic sufficiency also highlights the relevance of the *Had Kifayah* framework as a contextual measure of minimum living needs. Unlike conventional poverty lines that primarily capture income deprivation, *Had Kifayah* considers whether households are able to fulfil essential needs across areas such as food, housing, education, health, transportation, and religious obligations (Mawardi et al., 2023; Widiastuti et al., 2021). The observed movement of some households towards material sufficiency therefore indicates a broader improvement in the measured dimensions of living standards, which is closely aligned with the objectives of Islamic social finance and *Maqasid al-Shariah*.

5.2. Spiritual Welfare Enhancement

Beyond the observed material improvements, the study found positive changes in the measured spiritual welfare indicators among programme participants. The increases observed in prayer, fasting, *zakat* and *infaq*, and the family religious environment support the multidimensional perspective of the CIBEST Model, which considers spiritual development an integral component of household welfare. This finding is consistent with Beik and Arsyianti (2016), who argued that sustainable welfare cannot be separated from the interaction between material capability and spiritual fulfilment. The inclusion of regular religious mentoring within the Madrasah Bisnis Al-Aqsha programme may have supported beneficiaries' religious commitment alongside their entrepreneurial capacity. This interpretation is also consistent with Hudaefi et al. (2025), who found that *zakat* programmes incorporating continuous mentoring can generate more sustained behavioural and welfare improvements than purely financial interventions. Accordingly, productive *zakat* may be viewed as a holistic empowerment strategy that addresses both material and spiritual dimensions of household welfare, rather than solely as a form of conventional poverty assistance.

5.3. Implications for Productive Zakat

The findings have important implications for *zakat* institutions and public policy. For *zakat* managers, the results suggest that the effectiveness of productive *zakat* may depend not only on the amount of capital distributed but also on the quality of business mentoring and continuous beneficiary development. Integrating entrepreneurial coaching with spiritual guidance may support the sustainability of welfare improvements and reduce the risk of beneficiaries returning to poverty (Hadi et al., 2024; Hamid et al., 2024; Sudrajat, 2023; Widiastuti et al., 2021). From a policy perspective, the combination of the CIBEST Model and the *Had Kifayah* framework offers a practical monitoring approach for assessing *zakat* outcomes beyond financial indicators alone. This multidimensional approach enables *zakat* institutions to assess household welfare more comprehensively and may

support evidence-based decision-making in the design of productive *zakat* programmes aligned with SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth) (Ayuniyyah et al., 2022; Hamid et al., 2024). Although the potential of *zakat* in Indonesia is substantial, this study provides further insight into strategies for strengthening the productive management of *zakat* (Nur et al., 2022; Roziq et al., 2022). Strategies that integrate productive *zakat* with entrepreneurship training have been associated with positive outcomes among *mustahik* in previous studies (Mustari et al., 2024; Rambe et al., 2022; The et al., 2021). In the present study, the median household income increased from Rp 4,000,000 to Rp 5,000,000, indicating an improvement in the observed economic conditions of participating *mustahik* households. This finding suggests that the combination of productive capital and entrepreneurship training may provide a useful approach to strengthening household economic capacity. With appropriate programme design and sustained support, productive *zakat* may serve as an important instrument for supporting poverty alleviation (Yusran & Afiyah, 2024).

The role of *amil zakat* institutions, such as LAZ Al-Aqsa De Latinos, also warrants greater empirical attention. The present study provides evidence from a specific institutional setting that structured *zakat* management can support improvements in the welfare of participating *mustahik*. The importance of *zakat* institutions in supporting the economic independence of *mustahik* has been highlighted by previous studies, which emphasise the role of institutional capacity in effective *zakat* management (Abdulrahman et al., 2024; Bin-Nashwan et al., 2021; Widiastuti et al., 2018). In this context, the experience of LAZ Al-Aqsa De Latinos may provide useful lessons for other *zakat* institutions in Indonesia, although further comparative research would be required to assess its wider applicability. This study also contributes to the discussion of the challenges faced by *mustahik* in managing productive *zakat* assistance (Beik et al., 2024). Barriers such as limited access to business capital and insufficient entrepreneurship training have been identified as important challenges for productive *zakat* programmes (Hanifuddin et al., 2024; Widiastuti et al., 2021). In the context examined in this study, the LAZ Al-Aqsa De Latinos programme addressed these challenges through an approach combining productive capital, entrepreneurship training, and continuous mentoring. By improving access to productive assets and capital while strengthening entrepreneurial capabilities, such programmes may support greater economic independence among *mustahik* and contribute to broader household welfare (Gallien et al., 2024; Sutrisno & Haron, 2020).

5.4. Limitations of the Study

This study should be interpreted in light of several limitations. First, the evaluation was conducted within a single productive *zakat* programme administered by Madrasah Bisnis Al-Aqsha, which may limit the generalisability of the findings to other *zakat* institutions or regions. Second, although the baseline–endline design enables the observation of changes in welfare over time, the absence of a comparison or control group means that the study cannot establish definitive causal relationships between participation in the productive *zakat* programme and the observed welfare improvements. Furthermore, the spiritual dimension of the CIBEST Model relies on self-reported responses, which may be subject to subjective perceptions and social desirability bias. Although the CIBEST framework has been widely adopted in Islamic social finance research, future studies could strengthen the assessment of spiritual welfare by incorporating complementary qualitative and longitudinal approaches. Future research could also employ multi-institutional longitudinal designs with larger samples and comparison groups, while incorporating objective socioeconomic indicators to strengthen the external validity and robustness of evaluations of productive *zakat* programmes.

6. Conclusion and Recommendations

This study evaluated changes in the material and spiritual welfare of *mustahik* households participating in the Madrasah Bisnis Al-Aqsha (MBA) productive *zakat* programme administered by LAZ Al-Aqsha De Latinos in South Tangerang City, Indonesia. Utilising a one-group baseline–endline quantitative design involving 57 beneficiary households over a 12-month programme period, the study assessed multidimensional welfare transitions using the CIBEST Model. The empirical findings demonstrate statistically significant improvements in selected material welfare indicators, specifically monthly household income and perceived economic sufficiency, alongside positive changes across the measured spiritual welfare indicators. Furthermore, CIBEST quadrant mapping reveals changes in household welfare status, including movement from poverty-related categories into the welfare quadrant at the endline measurement.

These findings suggest that combining productive *zakat* capital with structured entrepreneurial mentoring provides a promising approach to supporting household poverty alleviation. Rather than relying exclusively on

short-term financial assistance, the MBA initiative combines business capital with entrepreneurship training and mentoring in areas such as financial management, marketing, and business development. This integrated approach may strengthen the capacity of *mustahik* to manage their economic activities more independently. From a theoretical perspective, this approach is consistent with the Resource-Based View (RBV), which emphasises how physical resources and intangible capabilities can be combined to strengthen economic performance. Within Islamic social finance, productive *zakat* can therefore be understood as a foundational resource that, when combined with appropriate knowledge and capabilities, may support broader socio-economic empowerment. Despite the observed welfare gains, continuing operational challenges remain among participating *mustahik*. Limited access to additional business capital remains a constraint, particularly for beneficiaries seeking to expand their micro-enterprises beyond the initial start-up phase. In addition, some beneficiaries reported that entrepreneurship training could be strengthened to better address practical business challenges in a dynamic economic environment. Future programme development should therefore consider more comprehensive training components, including business risk management, innovation, digitalisation strategies, financial management, and market development.

The findings also highlight the importance of institutional support in the implementation of productive *zakat*. *Amil zakat* institutions such as LAZ Al-Aqsha De Latinos play an important role in coordinating capital provision, entrepreneurship training, mentoring, and performance monitoring. Greater coordination among *zakat* institutions, government agencies, and relevant private-sector stakeholders could further strengthen the ecosystem supporting productive *zakat*. Government policies may also facilitate this development through appropriate regulatory frameworks, institutional support, and incentives that encourage productive *zakat* initiatives while maintaining rigorous governance and accountability standards. From a policy perspective, productive *zakat* can contribute to broader efforts towards poverty alleviation, economic empowerment, and inclusive socio-economic development. The integration of the CIBEST Model with the contextualised *Had Kifayah* framework provides a multidimensional basis for monitoring welfare beyond income alone. Such an approach may also support the alignment of *zakat* programmes with relevant Sustainable Development Goals, particularly SDG 1 (No Poverty) and SDG 8 (Decent Work and Economic Growth). Future productive *zakat* programmes should prioritise empowerment-based approaches rather than short-term financial assistance alone. Business capital should be accompanied by continuous mentoring, entrepreneurship training, and regular monitoring to strengthen beneficiaries' capabilities to sustain and develop their economic activities. In addition, *zakat* institutions are encouraged to adopt comprehensive evaluation frameworks that capture both material and spiritual dimensions of welfare. The use of the CIBEST Model demonstrates the value of assessing welfare beyond income indicators, while the integration of economic empowerment with religious guidance, character development, and social support provides a more comprehensive approach to beneficiary development.

Finally, several methodological limitations must be acknowledged. The findings from this single-programme study should not be generalised to all *zakat* institutions or regions without further comparative evidence. Future research should employ larger and more diverse samples across multiple *zakat* institutions and regions, preferably using longitudinal designs and quasi-experimental comparison groups. Incorporating objective socio-economic indicators alongside self-reported measures of spiritual welfare would further strengthen the empirical robustness of the evidence. Such research would help determine whether the welfare changes observed in this study can be sustained over time and whether similar outcomes are observed across different institutional and socio-economic contexts.

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Enhancing Financial Resilience Among Malaysian Senior Citizens: Islamic Finance Mechanisms and the Moderating Role of Saving Behaviour

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Abstract

As Malaysia rapidly transitions towards an ageing nation, ensuring the financial well-being of older adults has become a critical socio-economic challenge. This study investigates the key determinants of financial resilience among Malaysian older adults, focusing on the effects of financial literacy, healthcare expenditure, and social support, while examining saving behaviour as a moderating factor. A quantitative research design was employed using primary data collected through a structured survey of 321 older adults selected via convenience sampling. The data were analysed using SPSS 22 and Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS 4. The structural model explains 51.8% of the variance in financial resilience. The findings indicate that healthcare expenditure has a significant negative effect on financial resilience, while saving behaviour and social support have significant positive effects. In contrast, financial literacy does not have a significant direct effect on financial resilience. Moderation analysis further reveals that saving behaviour significantly strengthens the relationship between financial literacy and financial resilience, whereas it does not significantly moderate the relationships between healthcare expenditure and financial resilience or between social support and financial resilience. These findings suggest that financial knowledge alone may be insufficient to enhance financial resilience unless translated into active saving practices. Furthermore, saving behaviour alone may not adequately mitigate the financial pressures associated with healthcare expenditure. The study therefore highlights the need for integrated policy frameworks that combine individual financial capability with institutional support mechanisms. In this regard, Islamic social finance instruments, particularly waqf, zakat, and takaful, can serve as complementary institutional safety nets to strengthen the long-term financial security and resilience of Malaysia's ageing population.

Keywords: Financial Resilience; Senior Citizens; Saving Behaviour; Healthcare Expenditure; Islamic Finance; Micro-Takaful.

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1. Introduction

Malaysia is undergoing a significant demographic transition, marked by a rapidly ageing population driven by declining birth rates, increasing life expectancy, and advances in healthcare. In 2020, 10.3% of Malaysians were aged 60 years and above. This proportion is projected to increase to 15.3% by 2030 and 23.6% by 2050 (Bernama, 2020), positioning Malaysia as an aged nation by 2030. This demographic shift presents significant challenges to economic productivity, fiscal sustainability, and social equity (KWAP, 2024). While population ageing reflects improvements in living conditions and healthcare, it also exposes financial vulnerabilities among older adults, particularly through rising healthcare costs, inadequate retirement savings, and weakening traditional family support structures. Older adults account for approximately 40% of Malaysia's total healthcare expenditure, amounting to RM9.32 billion annually, which places considerable pressure on both household finances and public healthcare systems (Manaf et al., 2021). Consequently, shifting the academic and policy focus from merely addressing financial distress to proactively strengthening financial resilience is increasingly important.

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Existing research identifies healthcare expenditure, financial literacy, and social support as important factors associated with financial well-being among older adults (Leung et al., 2022; Al-Shaghdari et al., 2025). Recent evidence from Malaysia indicates that medical costs, saving behaviour, and social support significantly influence financial vulnerability among B40 older adults, whereas financial literacy does not exhibit a significant direct relationship with financial vulnerability (Al-Shaghdari et al., 2025). These findings highlight the importance of saving behaviour in shaping financial security. However, Malaysian studies have primarily examined saving behaviour as a direct determinant of financial vulnerability rather than investigating its potential to alter the strength of relationships between other socio-economic determinants and financial resilience. Accordingly, its moderating role remains underexplored, particularly regarding whether saving behaviour alters the relationships between financial literacy, social support, healthcare expenditure, and financial resilience. This distinction is theoretically important because financial resilience depends not only on the availability of financial knowledge and social resources but also on an individual's ability to translate these resources into accumulated financial buffers capable of absorbing unexpected expenditure shocks. Therefore, the present study extends the literature by conceptualising saving behaviour as a moderator of these key socio-economic relationships among Malaysian older adults.

To address this research gap, this study empirically tests whether saving behaviour moderates the relationships between healthcare expenditure, financial literacy, social support, and financial resilience among older adults in Malaysia. This provides empirical evidence on the conditional role of saving behaviour in shaping financial resilience within an ageing population. Beyond its empirical contribution, the study draws on Islamic finance principles to propose policy-oriented mechanisms designed to support the financial well-being of older adults. The findings offer valuable insights for policymakers, financial institutions, healthcare providers, and other stakeholders seeking to strengthen the financial security and quality of life of Malaysia's ageing population. Furthermore, the study aligns with broader national priorities, including the Madani Economic Framework, and contributes to the achievement of relevant United Nations Sustainable Development Goals (SDGs). The remainder of this paper is structured as follows. Section 2 reviews the relevant literature and establishes the study's theoretical foundations, including perspectives on financial resilience, saving behaviour, and Islamic social finance. Section 3 details the research methodology, encompassing the study design, sampling strategy, data collection procedures, and analytical approach. Section 4 reports the empirical findings, while Section 5 discusses the results and their implications. Section 6 presents the study's theoretical contributions, practical implications, and limitations. Finally, Section 7 concludes the paper by providing policy recommendations and directions for future research.

2. Literature Review

2.1 Theoretical Foundation

This study draws on four complementary theoretical perspectives to explain financial resilience among older adults in Malaysia: Life Cycle Theory, Social Support Theory, the Health Economics perspective, and Contingency Theory. Each perspective provides a distinct rationale for the relationships examined in the empirical model. Life Cycle Theory (LCT) explains how individuals allocate income between consumption and saving over the course of their lives. The theory suggests that individuals make financial decisions based on their expected lifetime resources, including the accumulation and utilisation of savings across different stages of life (Modigliani & Parkin, 1975; Lusardi & Mitchell, 2011). In the context of an ageing population, LCT provides a basis for understanding the importance of financial literacy and saving behaviour in retirement preparation and later-life resource management. Financial literacy may support informed financial planning, while saving behaviour reflects the practical accumulation and preservation of financial resources needed to maintain financial stability when income becomes relatively fixed.

Social Support Theory provides a framework for examining the role of interpersonal and community resources in helping individuals cope with stressful circumstances. Social support may take emotional, informational, and instrumental forms and can originate from family members, friends, community organisations, and broader social networks (Cohen & Wills, 1985; Thoits, 2011). For older adults, such support may include financial assistance, help with healthcare and daily living expenses, information relevant to financial decisions, and emotional support during periods of financial difficulty. These resources may strengthen individuals' capacity to cope with adverse circumstances and, consequently, contribute to financial resilience. The Health Economics perspective provides a basis for understanding the relationship between healthcare expenditure and financial resilience. Healthcare needs generally increase with age, while income during retirement may become relatively fixed. Consequently, substantial or unexpected healthcare expenditure may reduce disposable income, draw down accumulated savings, and leave fewer financial resources available to meet subsequent needs. This perspective therefore provides a theoretical basis for expecting a negative association between healthcare expenditure and financial resilience. Finally, Contingency Theory provides the principal theoretical basis for the moderating role of saving behaviour. The theory proposes that outcomes may depend on the interaction between contextual conditions and behavioural responses rather than on individual factors operating independently (Luthans & Stewart, 1977; Donaldson, 2001).

Applied to the present study, the financial resilience of older adults may depend not only on their levels of financial literacy, healthcare expenditure, and social support but also on how saving behaviour conditions these relationships. Saving behaviour may therefore strengthen or weaken the association between socio-economic factors and financial resilience. Collectively, these four perspectives provide the theoretical foundation for examining both the direct determinants of financial resilience and the conditional role of saving behaviour. Islamic finance mechanisms are incorporated subsequently as a contextual and policy-oriented framework through which the empirical findings can be translated into potentially relevant Shariah-compliant policy responses.

2.2 Financial Resilience

Financial resilience refers to the capacity of individuals or households to anticipate, absorb, cope with, and recover from financial shocks while maintaining an acceptable level of financial well-being (Rayampatt & Rajan, 2025). Although closely related to financial vulnerability, the two concepts reflect distinct dimensions of financial security. Financial vulnerability generally concerns an individual's exposure or susceptibility to financial shocks, whereas financial resilience emphasises the capacity to withstand and recover from such shocks (Lusardi et al., 2020). Previous research has examined financial vulnerability through indicators including financial fragility, insufficient financial resources, excessive debt, and difficulties in meeting unexpected expenses (Lusardi et al., 2020; Mahdzan et al., 2020; Seldal & Nyhus, 2022). A resilience-oriented perspective shifts attention from the mere absence of financial resources towards the capabilities, resources, and behaviours that enable individuals to maintain financial stability during periods of adversity. This perspective is particularly relevant to older adults because their financial circumstances may be influenced by relatively fixed post-retirement income, accumulated wealth, inflation, healthcare needs, and the gradual depletion of retirement resources. Financial resilience during later life may therefore depend on a combination of financial capabilities, behavioural practices, available resources, social support, and the ability to manage unexpected expenditure.

The relationship between financial resilience and saving is particularly relevant in later life. Financial resilience may be strengthened when individuals possess sufficient financial buffers to manage unexpected expenditure without substantially compromising their standard of living. Recent research has also highlighted the relationship between financial resilience and retirement saving behaviour, suggesting that the capacity or willingness to save is relevant to financial security over the life course (Suh, 2022). In the Malaysian context, the financial resilience of the ageing population is increasingly important as individuals transition from employment-based income towards retirement resources. Opportunities to compensate for financial shortfalls through additional employment may become more limited during later life. Consequently, the ability to manage existing resources, maintain appropriate saving practices, obtain social support, and manage healthcare expenditure may be important for maintaining financial stability. The present study therefore adopts a resilience-oriented perspective to examine the factors associated with the capacity of Malaysian older adults to withstand financial pressures.

2.3 Financial Literacy and Financial Resilience

Financial literacy refers broadly to the knowledge and skills required to understand financial concepts and make informed financial decisions (Lusardi, 2019; Seldal & Nyhus, 2022). It is widely recognised as an important component of effective financial management, including saving, investment, and retirement planning. Financially literate individuals may be better positioned to assess financial risks, evaluate financial products, manage expenditure, and make informed decisions concerning their financial resources (Lusardi, 2019). Financial literacy may contribute to financial resilience by supporting more effective financial planning and resource management. Individuals with greater financial knowledge may be better able to identify financial risks, plan for retirement, manage expenditure, and accumulate financial resources. From the perspective of Life Cycle Theory, financial literacy may facilitate more informed allocation of resources across different stages of the life course and support preparation for periods in which earned income becomes less available (Lusardi & Mitchell, 2011). However, financial knowledge does not necessarily translate automatically into appropriate financial behaviour. Research on household financial management has highlighted the distinction between financial knowledge and its application in actual financial practices (Hilgert et al., 2003). Similarly, research on financial health literacy suggests that financial knowledge and capabilities may have different implications across stages of the life course, including midlife and older age (Leung et al., 2022). Thus, possessing financial knowledge may provide an important cognitive foundation, but its contribution to financial resilience may depend partly on whether individuals apply such knowledge through appropriate financial practices.

This distinction may be particularly relevant among older adults, who may face financial constraints associated with fixed retirement income, healthcare expenditure, and the depletion of accumulated resources. Consequently, the direct relationship between financial literacy and financial resilience may not necessarily be uniform across individuals. Examining this relationship is therefore important for determining whether financial literacy is directly associated with financial resilience among Malaysian older adults. Based on the preceding discussion, the following hypothesis is proposed:

H1: Financial literacy has a positive effect on financial resilience among older adults in Malaysia.

2.4 Healthcare Expenditure and Financial Resilience

Healthcare expenditure represents an important potential source of financial pressure during later life. As healthcare needs increase with age, older adults may face higher expenditure on medical treatment, medication, consultations, and other health-related needs. This pressure may be particularly significant when income becomes relatively fixed after retirement. Healthcare-related expenditure can affect financial security beyond the immediate cost of treatment. Substantial medical expenses may reduce disposable income and require individuals to draw upon accumulated savings or other financial resources. When financial buffers are insufficient, medical expenditure may increase financial vulnerability and reduce the resources available to respond to subsequent financial pressures. He and Zhou (2022), for example, examine household financial vulnerability in relation to income and medical expenditure shocks, highlighting the relevance of healthcare-related financial pressures to household financial security. The relationship can also be understood through the Health Economics perspective. Healthcare expenditure may represent a greater financial burden when individuals have limited income flexibility or insufficient financial protection. For older adults who rely primarily on retirement income and accumulated resources, increases in healthcare expenditure may consequently constrain their capacity to maintain financial stability.

Evidence on financial fragility also suggests that households with limited financial buffers may be particularly vulnerable when faced with unexpected expenditure (Ampudia et al., 2016). Although financial fragility is broader than healthcare expenditure specifically, this literature provides further support for considering the availability of financial resources when examining the financial consequences of healthcare-related expenditure. In Malaysia, the relationship between healthcare expenditure and financial resilience warrants particular attention in view of population ageing and the associated increase in healthcare needs. However, the magnitude of the relationship may vary according to the financial resources available to individuals. In particular, saving behaviour may provide a financial buffer that influences the extent to which healthcare expenditure is associated with financial resilience. Accordingly, the following hypothesis is proposed:

H2: Healthcare expenditure has a negative effect on financial resilience among older adults in Malaysia.

2.5 Saving Behaviour and Financial Resilience

Saving behaviour refers to the practices through which individuals allocate part of their available financial resources towards future needs, emergencies, retirement, or other financial objectives. Saving behaviour is particularly relevant to financial resilience because accumulated financial resources can provide a buffer against unexpected expenditure and temporary income disruptions. Life Cycle Theory provides a theoretical basis for understanding the role of saving across different stages of life. Individuals are expected to allocate resources over their lifetime in response to expected income and consumption needs, including the accumulation of resources during working years for use during retirement (Modigliani & Parkin, 1975; Lusardi & Mitchell, 2011). From this perspective, saving behaviour represents an important mechanism through which financial resources can be accumulated and subsequently utilised during later life. Previous research has linked financial capability and saving-related practices with improved financial outcomes. Xiao and O'Neill (2016) emphasise the importance of financial capability in consumer financial behaviour, while Suh (2022) specifically examines the relationship between financial resilience and discretionary retirement saving. These findings suggest that saving capacity and behaviour are relevant dimensions of financial security over the life course. The importance of saving behaviour may be particularly pronounced during later life because opportunities to compensate for financial shortfalls through employment may become more limited. Adequate financial buffers can provide individuals with greater capacity to meet unexpected expenditure without immediately relying on external assistance or substantially reducing essential consumption. Saving behaviour may therefore represent an important behavioural component of financial resilience. Accordingly, the present study proposes that stronger saving behaviour is positively associated with financial resilience among Malaysian older adults.

H3: Saving behaviour has a positive effect on financial resilience among older adults in Malaysia.

2.6 Social Support and Financial Resilience

Social support refers to emotional, informational, and instrumental resources obtained through interpersonal and community relationships (Mohd et al., 2019; Cohen & Wills, 1985; Thoits, 2011). For older adults, these resources may originate from family members, friends, community organisations, and other social networks. Support may include direct financial assistance, help with healthcare and daily living expenses, information relevant to financial decision-making, and emotional reassurance during periods of difficulty. Social Support Theory proposes that social relationships can assist individuals in coping with stressful circumstances and may reduce the adverse

consequences associated with such circumstances (Cohen & Wills, 1985). Social support may operate through several channels. Direct financial assistance can provide immediate resources, while practical assistance may reduce living or healthcare-related expenditure. Informational support may also facilitate access to relevant financial or social resources, whereas emotional support may strengthen an individual's ability to cope with financial stress (Thoits, 2011). Empirical evidence further supports the importance of social relationships for the well-being and resilience of older adults. Mohd et al. (2019) highlight the role of social support among community-dwelling older adults in Asia, while Tadai et al. (2023) demonstrate the relevance of social support and resilience to the well-being of older adults in Singapore. More directly relevant to the Malaysian context, van der Meulen Rodgers et al. (2025) examine the role of family support in the well-being of older people in Malaysia and Viet Nam.

These findings suggest that family and social networks may represent an important source of support during later life. Nevertheless, social support should not be interpreted solely as direct financial transfers. Emotional, informational, and practical assistance may also contribute to an individual's capacity to manage financial and other forms of stress. Despite the recognised importance of social support for older adults' well-being, empirical evidence specifically examining its relationship with financial resilience among Malaysian older adults remains limited. The present study therefore examines whether social support is positively associated with financial resilience. Based on this rationale, the following hypothesis is proposed:

H4: Social support has a positive effect on financial resilience among older adults in Malaysia.

2.7 Moderating Role of Saving Behaviour

The preceding sections establish financial literacy, healthcare expenditure, saving behaviour, and social support as potential determinants of financial resilience. However, the relationships between these factors and financial resilience may vary across individuals. In particular, saving behaviour may influence the extent to which financial knowledge, healthcare-related financial pressures, and social resources are associated with financial resilience. Accordingly, this study conceptualises saving behaviour as both a direct predictor and a moderating variable. Contingency Theory provides the principal theoretical basis for this proposition. The theory suggests that outcomes may depend on the interaction between contextual conditions and behavioural responses rather than on individual factors operating independently (Luthans & Stewart, 1977; Donaldson, 2001). Applied to the present study, the financial resilience of older adults may therefore depend partly on how saving behaviour interacts with financial literacy, healthcare expenditure, and social support. The moderating role proposed in this study differs conceptually from mediation. Saving behaviour is not proposed to explain the mechanism through which the independent variables produce financial resilience. Rather, it is expected to condition the strength of the relationships between the independent variables and financial resilience. This distinction is important because individuals with similar levels of financial literacy, healthcare expenditure, or social support may nevertheless exhibit different levels of financial resilience depending on their saving practices.

2.7.1 Financial Literacy, Saving Behaviour and Financial Resilience

Financial literacy provides individuals with knowledge and skills that may support effective financial decision-making. However, knowledge alone may not necessarily result in consistent saving or accumulation of financial resources. Evidence concerning the relationship between financial knowledge and financial behaviour highlights the importance of considering how financial knowledge is translated into actual financial practices (Hilgert et al., 2003). Saving behaviour may therefore condition the relationship between financial literacy and financial resilience. Individuals who possess financial knowledge and simultaneously engage in regular saving may be better positioned to convert that knowledge into financial buffers. By contrast, individuals with comparable financial knowledge but weaker saving practices may accumulate fewer resources to address unexpected expenditure. This proposition is also consistent with the broader distinction between financial capability and financial behaviour identified in the financial literacy literature (Lusardi, 2019; Seldal & Nyhus, 2022). Accordingly, saving behaviour may strengthen the positive association between financial literacy and financial resilience by influencing the extent to which financial knowledge is reflected in actual financial practices. Therefore, the following hypothesis is proposed:

H5: Saving behaviour moderates the relationship between financial literacy and financial resilience among older adults in Malaysia.

2.7.2 Healthcare Expenditure, Saving Behaviour and Financial Resilience

Healthcare expenditure may reduce financial resilience by placing pressure on disposable income and accumulated financial resources. However, the financial consequences of healthcare-related expenditure may vary according to the financial buffers available to individuals. Saving behaviour may represent one such buffer. Individuals who have accumulated financial resources through regular saving may have greater capacity to meet

healthcare-related expenditure without substantially compromising resources allocated to essential consumption or other financial obligations. Conversely, individuals with limited saving may have fewer resources available to absorb higher healthcare expenditure. From a contingency perspective, the relationship between healthcare expenditure and financial resilience may therefore vary according to saving behaviour. Stronger saving behaviour may reduce the strength of the negative association between healthcare expenditure and financial resilience, although it would not necessarily eliminate the financial burden associated with healthcare expenditure. Accordingly, the following hypothesis is proposed:

H6: Saving behaviour moderates the relationship between healthcare expenditure and financial resilience among older adults in Malaysia.

2.7.3 Social Support, Saving Behaviour and Financial Resilience

Social support may provide older adults with financial, informational, emotional, and practical resources that assist them in managing financial pressures. However, the relationship between social support and financial resilience may also vary according to individuals' own financial practices. Saving behaviour may complement external support by providing an additional source of financial capacity. For example, an individual receiving family assistance may nevertheless benefit from maintaining personal financial reserves, thereby reducing dependence on external support when unexpected expenditure occurs. Conversely, individuals with limited saving behaviour may rely more heavily on family or community support when facing financial pressures. Accordingly, saving behaviour may condition the relationship between social support and financial resilience. Stronger saving behaviour may strengthen the positive association between social support and financial resilience by complementing external resources with internally accumulated financial buffers. Thus, the following hypothesis is proposed:

H7: Saving behaviour moderates the relationship between social support and financial resilience among older adults in Malaysia.

Taken together, H5–H7 extend the analysis beyond direct relationships by examining whether the association between key socio-economic factors and financial resilience varies according to saving behaviour. This approach recognises that financial resilience may reflect not only the presence of financial knowledge, healthcare pressures, and social resources but also the financial practices through which individuals manage these conditions.

2.8 Islamic Finance Mechanisms as a Policy Framework

The empirical component of this study examines the relationships between financial literacy, healthcare expenditure, social support, saving behaviour, and financial resilience. Islamic finance mechanisms are not included as empirical constructs in the structural model. Instead, they provide a contextual and policy-oriented lens through which the empirical findings can be interpreted and translated into potentially relevant Shariah-compliant mechanisms for strengthening financial resilience among vulnerable groups. Malaysia's established dual financial system provides an institutional context in which conventional and Islamic financial mechanisms operate alongside one another. Islamic finance is informed by principles including risk-sharing, social justice ('*adl*'), preservation of wealth (*hifz al-mal*), and mutual cooperation. These principles provide a potentially relevant basis for considering financial and social mechanisms aimed at strengthening financial security among vulnerable populations. The findings concerning healthcare expenditure may, for example, have implications for the accessibility and design of Takaful-based protection mechanisms. Takaful is based on mutual cooperation and the principle of *tabarru'*, under which participants make contributions towards a common fund for mutual protection. Takaful and micro-Takaful arrangements may therefore represent potential mechanisms for improving financial protection against healthcare-related expenditure, subject to appropriate product design, affordability, eligibility, and regulatory safeguards. Evidence concerning Takaful participation in Malaysia provides a relevant context for considering the role of Shariah-compliant protection mechanisms (Hassan et al., 2018). The importance of saving behaviour also has implications for Shariah-compliant financial planning and wealth management. Islamic financial institutions offer various structures based on Shariah contracts, although the specific suitability of such products for older adults depends on factors such as liquidity requirements, risk tolerance, affordability, and product characteristics. Consequently, the empirical importance of saving behaviour may support greater attention to accessible and appropriate Shariah-compliant saving and retirement solutions.

The findings concerning social support may also have implications for Islamic social finance mechanisms, particularly Waqf and Zakat. Waqf has been discussed as a mechanism for supporting social and economic development, while Zakat may provide targeted assistance to eligible individuals experiencing financial hardship. Recent research has also examined the development of Waqf-based financial and technological mechanisms, including Waqf crowdfunding (Megat et al., 2024), while Muhammad and Al-Shaghdari (2024; 2025) highlight

broader applications of Islamic social finance in addressing socio-economic challenges. In the context of older adults, such mechanisms could potentially complement family support and individual financial resources. For example, appropriately structured Waqf initiatives could support social services, healthcare-related facilities, or accommodation for eligible beneficiaries, while Zakat could provide targeted assistance to those who meet the relevant eligibility criteria. These applications should, however, be regarded as potential policy directions rather than established outcomes of the present study.

Importantly, the Islamic finance mechanisms discussed in this section are not statistically evaluated in the present study. The study does not test whether Takaful, Waqf, Zakat, or specific Islamic financial contracts directly improve financial resilience. Rather, these mechanisms are presented as potential institutional and policy responses informed by the empirical findings. Their effectiveness, accessibility, affordability, and adoption among older adults should be examined empirically in future research.

2.9 Research Conceptual Framework

The conceptual framework presented in Figure 1 illustrates the proposed determinants of financial resilience among older adults in Malaysia. The empirical model is theoretically grounded in Life Cycle Theory, Social Support Theory, the Health Economics perspective, and Contingency Theory. Financial literacy, healthcare expenditure, and social support are specified as direct predictors of financial resilience, while saving behaviour is positioned both as a direct predictor and as a moderating variable. The framework proposes that financial literacy and social support are positively associated with financial resilience, whereas healthcare expenditure is expected to be negatively associated with financial resilience. Saving behaviour is expected to have a positive direct relationship with financial resilience and to moderate the relationships between financial literacy, healthcare expenditure, social support, and financial resilience. The proposed relationships are empirically examined using Partial Least Squares Structural Equation Modelling (PLS-SEM). Islamic finance mechanisms remain outside the empirical model and serve as a contextual and policy-oriented lens for interpreting the findings and developing recommendations relevant to the Malaysian institutional environment. The synthesised relationships and corresponding hypotheses are presented in Table 1.

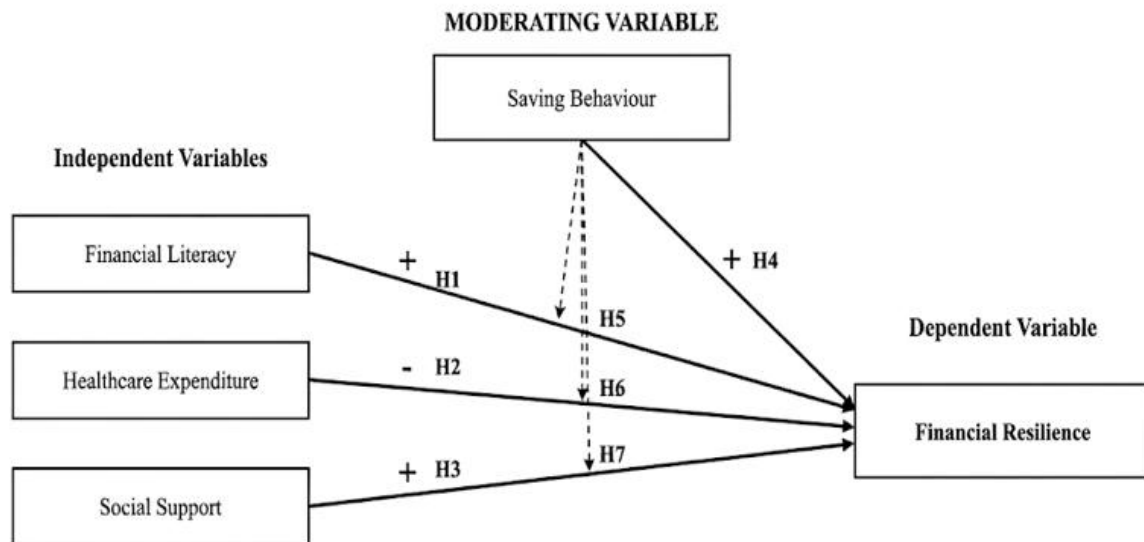


Figure 1: Research Framework, (Source: Author's draft)

Table 1. Research Hypotheses Code and Description updated

Code	Description	Path
H1	Financial literacy is positively associated with financial resilience among older adults in Malaysia.	FL → FR
H2	Healthcare expenditure is negatively associated with financial resilience among older adults in Malaysia.	HE → FR
H3	Saving behaviour is positively associated with financial resilience among older adults in Malaysia.	SB → FR
H4	Social support is positively associated with financial resilience among older adults in Malaysia.	SS → FR
H5	Saving behaviour moderates the relationship between financial literacy and financial resilience among older adults in Malaysia.	FL × SB → FR

Code	Description	Path
H6	Saving behaviour moderates the relationship between healthcare expenditure and financial resilience among older adults in Malaysia.	$HE \times SB \rightarrow FR$
H7	Saving behaviour moderates the relationship between social support and financial resilience among older adults in Malaysia.	$SS \times SB \rightarrow FR$

3. Research Methodology

This study adopts a deductive, quantitative, and cross-sectional research design to empirically examine the determinants of financial resilience among older adults in Malaysia. Specifically, it investigates the direct relationships of healthcare expenditure, financial literacy, social support, and saving behaviour with financial resilience, alongside the moderating role of saving behaviour. As established in the literature review, the empirical model is anchored in Life Cycle Theory, Social Support Theory, the Health Economics perspective, and Contingency Theory. Islamic finance mechanisms are not included as empirical constructs; rather, they serve as a policy-oriented framework for interpreting the empirical findings and developing targeted policy implications. Primary data were collected via a self-administered questionnaire using convenience sampling. The target population comprised Malaysian citizens aged 60 years and above who voluntarily participated in the study. While convenience sampling facilitates access to geographically dispersed populations, its non-probability nature introduces potential self-selection bias and limits the generalisability of the findings. Ultimately, 321 valid responses were retained for empirical analysis. This sample size exceeds commonly applied minimum requirements for Partial Least Squares Structural Equation Modelling (PLS-SEM), providing an adequate basis for estimating the proposed structural relationships.

Data analysis proceeded in two stages. Initially, IBM SPSS Statistics Version 22 was utilised for data preparation, including data screening, coding, missing-value assessment, and descriptive analysis. Subsequently, PLS-SEM was conducted using SmartPLS 4 (Hair & Alamer, 2022; Sarstedt et al., 2022). The PLS-SEM procedure followed a systematic two-stage approach, comprising measurement model assessment followed by structural model assessment. The measurement model was assessed to establish the reliability and validity of the reflective constructs. Indicator reliability was evaluated using outer loadings, while internal consistency reliability was assessed using Cronbach's alpha and composite reliability (CR), with values of 0.70 or higher considered acceptable. Convergent validity was assessed using the Average Variance Extracted (AVE), applying a minimum threshold of 0.50, indicating that the construct explains at least half of the variance in its indicators (Hair et al., 2014). Discriminant validity was assessed using both the Fornell–Larcker criterion (Fornell & Larcker, 1981) and the Heterotrait–Monotrait (HTMT) ratio (Henseler et al., 2015).

Following assessment of the measurement model, the structural model was evaluated to test the formulated hypotheses. This phase examined the four direct relationships (H1–H4) and three moderating relationships (H5–H7). Hypothesis testing employed a non-parametric bootstrapping procedure with 5,000 subsamples to generate bootstrap-based standard errors, t-statistics, confidence intervals, and p-values. The significance and direction of the path coefficients were then examined to determine whether the proposed hypotheses were supported. Finally, the explanatory power of the structural model was assessed using the coefficient of determination (R^2) for financial resilience, which indicates the proportion of variance in financial resilience explained by the model's predictors. In addition, the significance and direction of the interaction terms were examined to determine whether saving behaviour significantly moderates the relationships between financial literacy, healthcare expenditure, social support, and financial resilience.

4. Data Analysis and Results

4.1 Respondents Demographic Analysis

The demographic characteristics of the respondents, including gender, age, marital status, educational attainment, occupational status, income level, source of income, and housing status, are presented in Table 2. The analysis provides an overview of the characteristics of the 321 Malaysian older adults included in the study.

Table 2: Demographic analysis of the respondents

Variables	Coding	Frequency	Percentage
Gender	Male	77	24.0
	Female	244	76.0
Age	60 – 65	211	65.7
	66 – 70	70	21.8
	Above 70	40	12.5

Marital Status	Single	12	3.7
	Married	231	72.0
	Widow	78	24.3
Level of Education	Primary education	29	9.0
	Secondary School	59	18.4
	Pre-University	59	18.4
	Bachelor Degree	85	26.5
	Master Degree	57	17.8
	Phd degree	32	10.0
Occupational Status	Retired	254	79.1
	Still working	17	5.3
	Unemployed	18	5.6
	Unable to work	21	6.5
	Owns a Business	11	3.4
Income level	No income	38	11.8
	Less than RM2000	61	19.0
	RM2,001 to RM4,850	109	34.0
	RM4851 to RM10,959	97	30.2
	More than RM10,959	16	5.0
Source of income	Pension	223	69.5
	Personal saving	17	5.3
	Personal investments	3	0.9
	Assistance from family	41	12.8
	Governments assistance	12	3.7
	Income from employment	25	7.8
House Status	Own house	269	83.8
	Rented house	22	6.9
	Living with family	24	7.5
	Living in a care home	6	1.9

N=321

The sample was predominantly female, with women accounting for 76.0% of respondents compared with 24.0% men. In terms of age, 65.7% of respondents were aged 60–65 years, followed by 21.8% aged 66–70 years and 12.5% aged above 70 years. Most respondents were married (72.0%), while 24.3% were widowed and 3.7% were single. Regarding educational attainment, the largest group held a bachelor's degree (26.5%), followed by respondents with secondary-school and pre-university qualifications (18.4% each). A further 17.8% held a master's degree and 10.0% held a PhD, while 9.0% reported primary education as their highest level of formal education. With respect to occupational status, the majority of respondents were retired (79.1%). The remaining respondents were unable to work (6.5%), unemployed (5.6%), employed (5.3%), or business owners (3.4%). In terms of income, 34.0% reported monthly income between RM2,001 and RM4,850, while 30.2% reported income between RM4,851 and RM10,959. A further 19.0% earned less than RM2,000, 11.8% reported no monthly income, and 5.0% earned more than RM10,959. Pension was the predominant source of income, reported by 69.5% of respondents, followed by assistance from family members (12.8%), employment income (7.8%), personal savings (5.3%), government assistance (3.7%), and personal investments (0.9%). Regarding housing status, 83.8% of respondents owned their homes, while 7.5% lived with family members, 6.9% rented their homes, and 1.9% resided in care homes.

4.2 Assessment of the Measurement Model: Reliability and Convergent Validity

The reflective measurement model was assessed for internal consistency reliability and convergent validity using SmartPLS 4. The results are presented in Table 3. Internal consistency reliability was assessed using Cronbach's alpha and composite reliability (CR), while convergent validity was assessed using the Average Variance Extracted (AVE). As shown in Table 3, Cronbach's alpha values ranged from 0.752 to 0.912, while composite reliability values ranged from 0.796 to 0.930. All values exceeded the recommended threshold of 0.70, indicating satisfactory internal consistency reliability. Financial Literacy recorded the highest composite reliability (CR = 0.930), followed by Saving Behaviour (CR = 0.922). Healthcare Expenditure recorded the lowest composite reliability (CR = 0.796), which nevertheless exceeded the recommended threshold. Convergent validity was supported as all constructs recorded AVE values above the recommended minimum of 0.50. Financial Resilience recorded the highest AVE (0.726), followed by Saving Behaviour (0.696), Social Support (0.642), Financial Literacy (0.640),

and Healthcare Expenditure (0.571). These results indicate that the constructs explain more than half of the variance in their respective indicators and satisfy the recommended criteria for convergent validity.

Table 3: Analysis of Internal consistency and reliability

Variables	Cronbach's Alpha	Composite Reliability (a)	Average Variance Extracted (AVE)
Financial Literacy	0.907	0.930	0.640
Healthcare Expenditure	0.752	0.796	0.571
Saving Behaviour	0.912	0.922	0.696
Social Support	0.866	0.882	0.642
Financial Resilience	0.905	0.910	0. 0.726

4.3 Analysis of Discriminant Validity

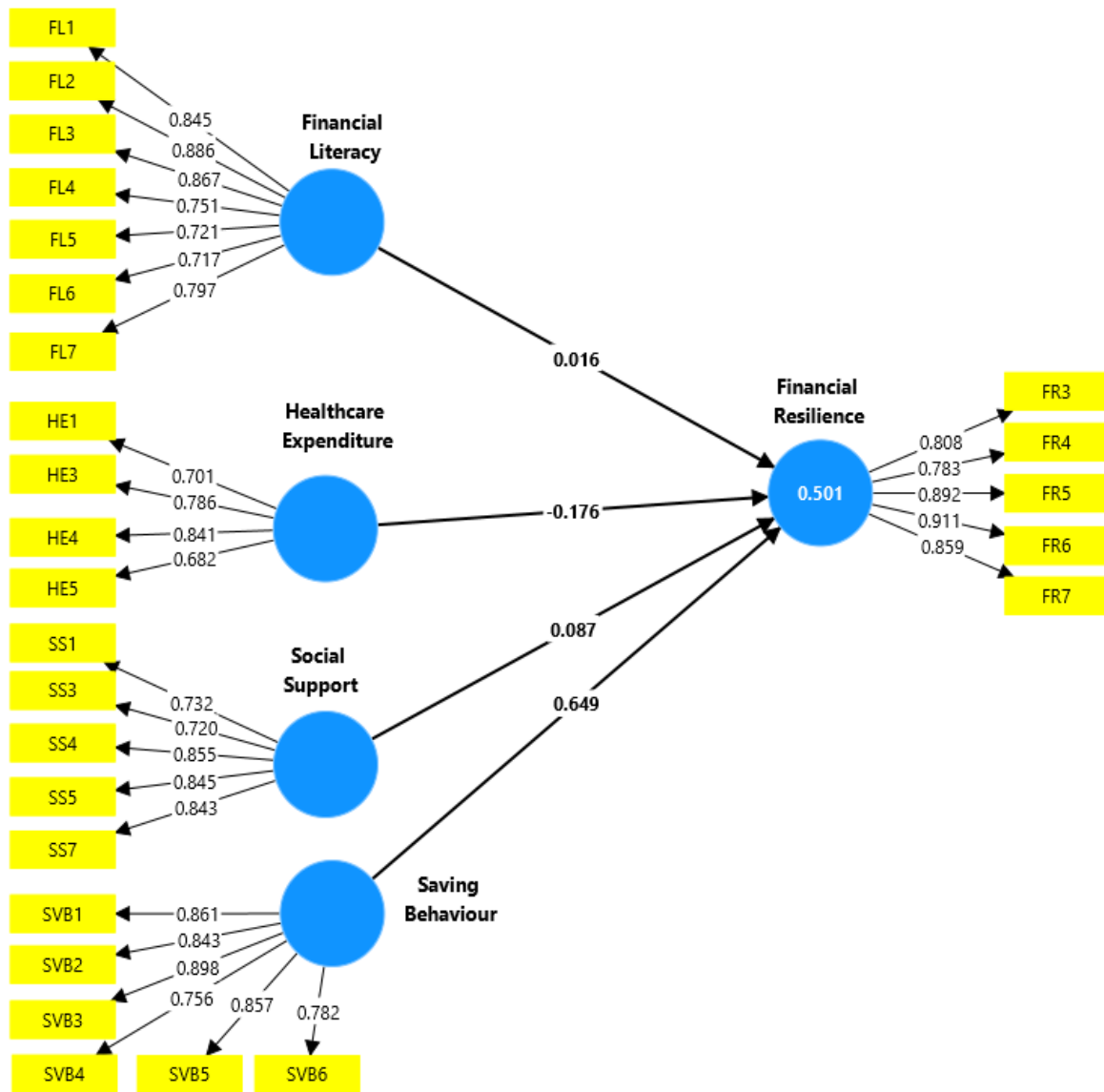
Discriminant validity was assessed using the Fornell–Larcker criterion. According to [Fornell and Larcker \(1981\)](#), discriminant validity is established when the square root of the AVE for each construct is greater than its correlations with the other constructs. As shown in Table 4, the square roots of the AVE values, presented on the diagonal, exceed the corresponding inter-construct correlations. For example, the square root of the AVE for Saving Behaviour is 0.834, which is greater than its correlation with Financial Resilience (0.680). Similarly, the square root of the AVE for Financial Resilience is 0.852 and exceeds its correlations with all other constructs. The same pattern is observed across all five constructs. These results provide evidence that the constructs demonstrate satisfactory discriminant validity.

Table 4: Discriminant Validity Analysis

Variables	FL	FR	HE	SVB	SS
Financial Literacy	0.800				
Financial Resilience	0.401	0.852			
Healthcare Expenditure	0.141	-0.149	0.755		
Saving Behaviour	0.600	0.680	0.041	0.834	
Social Support	0.229	0.306	-0.029	0.324	0.801

4.4 Assessment of the Structural Model

Following assessment of the measurement model, the structural model was evaluated to determine its explanatory power and to test the proposed relationships. The coefficient of determination (R^2) was used to assess the proportion of variance in the endogenous construct explained by the exogenous constructs (Hair & Alamer, 2022). As presented in Figure 2, the structural model produced an R^2 value of 0.511 for Financial Resilience. Based on commonly used guidelines for behavioural and social science research, this represents a moderate level of explanatory power. The result indicates that financial literacy, healthcare expenditure, saving behaviour, and social support collectively explain 51.1% of the variance in financial resilience among the sampled Malaysian older adults. The remaining 48.2% of the variance is attributable to factors not included in the present model. Overall, the R^2 result indicates that the proposed model has meaningful explanatory power for financial resilience within the study sample.

Figure 2 Items Loading, Path Coefficient, and R² Values

4.5 Structural Model Assessment and Hypothesis Testing

Figure 3 and Tables 5 and 6 present the results of the structural model assessment and hypothesis testing based on the bootstrapping procedure performed using SmartPLS 4. The analysis examined the four hypothesised direct relationships and three moderating relationships proposed in the conceptual framework.

The results indicate that Healthcare Expenditure is negatively associated with Financial Resilience, with a statistically significant path coefficient ($\beta = -0.144$, $t = 2.746$, $p = .006$). This finding supports H2, which proposed a negative relationship between healthcare expenditure and financial resilience. Saving Behaviour demonstrates a strong and statistically significant positive relationship with Financial Resilience ($\beta = 0.654$, $t = 11.615$, $p < .001$), thereby supporting H3. In contrast, Financial Literacy does not demonstrate a statistically significant direct relationship with Financial Resilience ($\beta = 0.062$, $t = 1.026$, $p = .305$), resulting in the rejection of H1. Similarly, Social Support does not demonstrate a statistically significant direct relationship with Financial Resilience ($\beta = 0.080$, $t = 1.718$, $p = .086$), and therefore H4 is rejected.

The moderation analysis examined whether Saving Behaviour significantly changes the strength of the relationships between the three antecedent variables and Financial Resilience. The interaction between Financial Literacy and Saving Behaviour is statistically significant (H5: $p = .020$), indicating that Saving Behaviour significantly moderates the relationship between Financial Literacy and Financial Resilience. Thus, H5 is supported. In contrast, the interaction between Healthcare Expenditure and Saving Behaviour is not statistically significant (H6: $p = .367$), indicating that Saving Behaviour does not significantly moderate the relationship between Healthcare Expenditure and Financial Resilience. Therefore, H6 is rejected. Similarly, the interaction between Social Support and Saving Behaviour is not statistically significant (H7: $p = .175$), resulting in the rejection of H7.

Overall, the structural model provides support for H2, H3, and H5, while H1, H4, H6, and H7 are not supported. These findings indicate that Saving Behaviour has a significant direct relationship with Financial Resilience and significantly moderates the relationship between Financial Literacy and Financial Resilience, whereas the proposed moderating relationships involving Healthcare Expenditure and Social Support are not statistically significant.

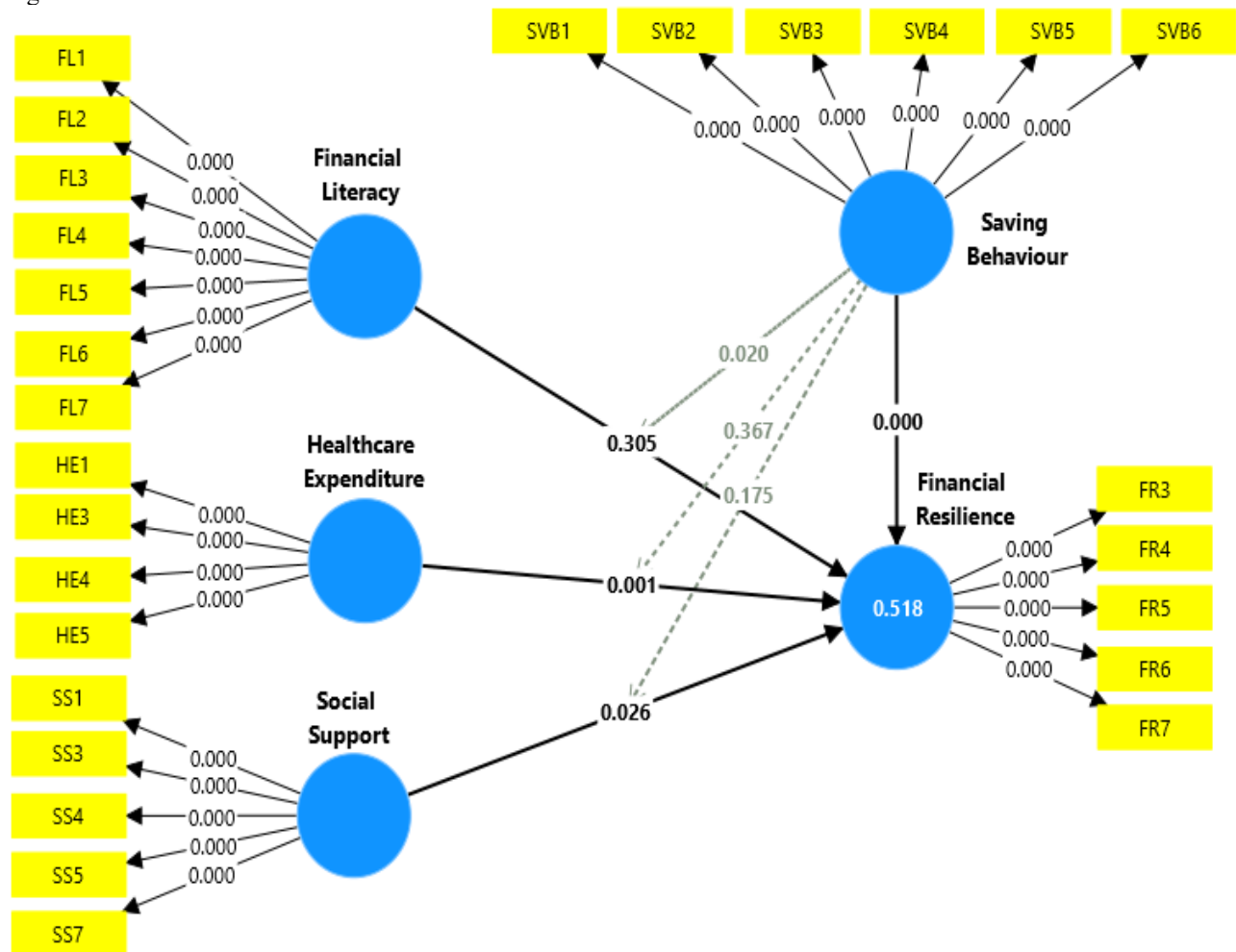


Figure 3. PLS Bootstrapping (p-values, t-value) for the research Model

Table 5: Direct effects Hypotheses Testing

Hypothesis	T -Value	P- values	Decision	
Financial Literacy -> Financial Resilience	1.026	0.305	H1	Rejected
Healthcare Expenditure -> Financial Resilience	3.279	0.001	H2	Accepted
Saving Behaviour -> Financial Resilience	11.487	0.000	H3	Accepted
Social Support -> Financial Resilience	2.225	0.026	H4	Accepted

Table 6: Interaction effects Hypotheses Testing

Hypothesis	T -Value	P- values	Decision	
Saving Behaviour x Social Support -> Financial Resilience	1.358	0.175	H1	Rejected
Saving Behaviour x Healthcare Expenditure -> Financial Resilience	0.902	0.367	H2	Rejected
Saving Behaviour x Financial Literacy -> Financial Resilience	2.321	0.020	H3	Accepted

5. Discussion of Results

The primary objective of this study was to examine the socio-economic and psychosocial factors associated with financial resilience among older adults in Malaysia and to assess the moderating role of saving behaviour. The structural model explains 51.8% of the variance in financial resilience ($R^2 = 0.518$), indicating a moderate level of explanatory power. The findings provide evidence that healthcare expenditure and saving behaviour are

important correlates of financial resilience, while the direct relationships of financial literacy and social support are not statistically significant. Furthermore, the moderation analysis indicates that saving behaviour significantly conditions the relationship between financial literacy and financial resilience, but does not significantly moderate the relationships involving healthcare expenditure or social support.

5.1 Direct Relationships with Financial Resilience

The first hypothesis (H1) proposed a positive relationship between financial literacy and financial resilience. The results indicate a positive but statistically non-significant relationship ($\beta = 0.062$, $t = 1.026$, $p = .305$), resulting in the rejection of H1. This finding differs from previous research that generally associates financial literacy with improved financial decision-making and financial well-being (Lusardi, 2019; Leung et al., 2022). Nevertheless, the finding is consistent with the broader argument that financial knowledge does not necessarily translate into effective financial behaviour or improved financial outcomes (Hilgert et al., 2003; O'Connor et al., 2019). Among older adults, financial literacy may therefore be insufficient on its own to strengthen financial resilience, particularly when income is relatively fixed and opportunities to increase financial resources are limited.

H2 proposed a negative relationship between healthcare expenditure and financial resilience. The results support this hypothesis, with healthcare expenditure showing a statistically significant negative relationship with financial resilience ($\beta = -0.144$, $t = 2.746$, $p = .006$). This finding is consistent with research identifying medical expenditure as an important source of household financial vulnerability (He & Zhou, 2022). Higher healthcare-related expenditure may reduce disposable financial resources and require older adults to draw upon savings or other assets, potentially reducing their capacity to absorb subsequent financial pressures. The finding therefore highlights the importance of healthcare affordability and financial protection in strengthening financial resilience among Malaysia's ageing population.

H3 proposed a positive relationship between saving behaviour and financial resilience. The hypothesis was strongly supported, with saving behaviour demonstrating a statistically significant positive relationship with financial resilience ($\beta = 0.654$, $t = 11.615$, $p < .001$). This finding is consistent with previous research highlighting the importance of saving behaviour and discretionary retirement saving for financial resilience (Suh, 2022). It also complements evidence that financial management behaviours can contribute to improved financial well-being (Magli et al., 2022). For older adults, accumulated savings may provide an important financial buffer against unexpected expenditure and fluctuations in household financial conditions. The relatively large path coefficient observed in this study further indicates that saving behaviour represents an important correlate of financial resilience within the study sample.

H4 proposed a positive relationship between social support and financial resilience. However, the relationship was positive but statistically non-significant ($\beta = 0.080$, $t = 1.718$, $p = .086$), resulting in the rejection of H4. This finding does not necessarily imply that social support is unimportant to older adults. Previous research has demonstrated the relevance of family and social support to the broader well-being and resilience of older adults (Tadai et al., 2023; van der Meulen Rodgers et al., 2025). However, the present findings suggest that such support may not translate directly into measurable financial resilience within this particular sample. One possible explanation is that social support may operate through indirect or conditional channels, including access to resources, emotional support, or assistance during specific financial difficulties, rather than producing a consistently significant direct relationship with financial resilience.

Overall, the direct-effect findings indicate that saving behaviour is the strongest positive predictor of financial resilience in the model, while healthcare expenditure is negatively associated with resilience. In contrast, financial literacy and social support do not demonstrate statistically significant direct relationships with financial resilience. These findings provide a basis for examining whether saving behaviour changes the strength of relationships between other socio-economic factors and financial resilience.

5.2 Moderating Effects

The moderation analysis provides further insight into the conditions under which the proposed relationships may vary. H5 proposed that saving behaviour moderates the relationship between financial literacy and financial resilience. The interaction term was statistically significant ($t = 2.321$, $p = .020$), supporting H5. This finding suggests that the relationship between financial literacy and financial resilience varies according to the level of saving behaviour. In other words, financial knowledge may be more closely associated with financial resilience among older adults who engage more actively in saving. This finding supports the distinction between possessing financial knowledge and applying that knowledge through financial behaviour (Hilgert et al., 2003).

H6 proposed that saving behaviour moderates the relationship between healthcare expenditure and financial resilience. The interaction effect was not statistically significant ($t = 0.902$, $p = .367$), resulting in the rejection of H6. This suggests that saving behaviour does not significantly alter the relationship between healthcare expenditure and financial resilience within the study sample. Although savings may provide an important general financial buffer, the results indicate that higher saving behaviour does not significantly change the negative association between healthcare expenditure and financial resilience. This finding highlights the possibility that

healthcare-related financial pressures may require complementary forms of financial protection beyond individual saving. Similarly, H7 proposed that saving behaviour moderates the relationship between social support and financial resilience. The interaction effect was statistically non-significant ($t = 1.358, p = .175$), resulting in the rejection of H7. The finding suggests that the relationship between social support and financial resilience does not vary significantly according to saving behaviour. Thus, although social support may provide broader forms of assistance to older adults, its relationship with financial resilience does not appear to be conditional on saving behaviour in the present sample.

Taken together, the moderation findings demonstrate that saving behaviour does not uniformly condition all relationships within the model. Its significant interaction with financial literacy indicates a specific conditional relationship, whereas the non-significant interactions involving healthcare expenditure and social support suggest that these relationships may depend on factors beyond individual saving practices.

5.3 Islamic Finance Policy Implications

The empirical findings provide a basis for considering Islamic finance mechanisms as potential policy-oriented responses to the financial challenges identified in the study. Importantly, these mechanisms were not empirically tested in the present research and should therefore be understood as proposed policy applications rather than direct empirical implications of the statistical model.

First, the significant moderating role of saving behaviour in the relationship between financial literacy and financial resilience suggests the potential value of linking financial education with practical saving opportunities. Islamic financial institutions could develop targeted Shariah-compliant savings products for older adults, supported by appropriate financial education and simple mechanisms that facilitate regular saving. Products structured using Shariah-compliant contracts, where appropriate, could provide older adults with accessible vehicles for implementing financial knowledge through actual saving practices.

Second, the negative relationship between healthcare expenditure and financial resilience, combined with the non-significant moderation effect of saving behaviour, suggests that individual savings alone may not fully address healthcare-related financial pressures. Islamic social finance mechanisms such as Waqf, Zakat, and Takaful could potentially complement individual financial preparation. For example, appropriately structured health-related Waqf initiatives could support community healthcare services, while Takaful-based arrangements could provide additional financial protection against eligible healthcare-related risks. Such mechanisms would require appropriate institutional design, Shariah governance, regulatory approval, and assessment of financial sustainability before implementation.

Third, although the direct relationship between social support and financial resilience was not statistically significant in the present study, previous evidence indicates that family and community support remain relevant to older adults' broader well-being. Islamic social finance mechanisms such as Infaq and Waqf could therefore complement existing informal support networks by providing structured channels through which community resources can be directed towards financially vulnerable older adults. Digital platforms may further improve transparency and accessibility, subject to appropriate governance and data-protection arrangements.

Overall, the findings suggest that Islamic finance should not be viewed as a substitute for individual financial behaviour or public social protection. Rather, Shariah-compliant financial and social-finance mechanisms may complement household saving, healthcare protection, and community support as part of a broader policy response to the financial challenges associated with population ageing.

6. Contributions, Implications, and Future Research

This study contributes to the literature on financial resilience among older adults by examining saving behaviour not only as a direct correlate of financial resilience but also as a moderating variable. The findings extend existing research by demonstrating that the relationship between financial literacy and financial resilience varies according to saving behaviour. At the same time, the non-significant direct relationship between financial literacy and financial resilience indicates that financial knowledge alone may not be sufficient to strengthen financial resilience among older adults. This finding reinforces the importance of distinguishing between financial knowledge and the behavioural application of that knowledge.

The study also contributes to the understanding of healthcare-related financial pressures in later life. The significant negative relationship between healthcare expenditure and financial resilience indicates that healthcare-related financial demands represent an important consideration in strengthening financial security among older adults. However, the non-significant moderation effect of saving behaviour suggests that individual saving practices do not significantly alter this relationship within the present sample. This finding highlights the potential importance of complementary financial protection and social-policy measures alongside individual financial preparation. A further contribution concerns the role of social support. Although social support was positively related to financial resilience, the relationship did not reach statistical significance. This finding provides a useful qualification to previous research emphasising the importance of family and social support for older adults' well-

being. It suggests that the financial implications of social support may operate through specific circumstances or indirect pathways that require further investigation.

From a practical perspective, the findings suggest that policymakers, financial institutions, and organisations supporting older adults should consider approaches that connect financial education with practical saving opportunities. Islamic financial institutions could complement conventional financial education with accessible Shariah-compliant savings products and financial planning services targeted at older adults. In addition, the negative association between healthcare expenditure and financial resilience indicates the potential value of complementary risk-sharing and social-finance mechanisms, including *Takaful*, *Waqf*, and *Zakat*, subject to appropriate institutional and regulatory arrangements. The study also provides implications for Islamic social finance policy. Rather than treating Islamic finance mechanisms as empirically established solutions, the findings provide a basis for exploring how *Waqf*, *Zakat*, *Takaful*, and *Infaq* could complement existing public and household-level support systems. Future policy development should therefore assess the feasibility, governance, affordability, accessibility, and Shariah compliance of such mechanisms before implementation.

Several avenues for future research emerge from the findings. First, future studies could empirically examine the adoption, accessibility, and willingness to participate in Islamic social-finance mechanisms designed to support older adults, including health-related *Waqf* and *Takaful* arrangements. Second, longitudinal research could investigate how saving behaviour develops across the life course and whether sustained saving practices have longer-term implications for financial resilience during retirement. Third, qualitative research involving older adults could provide deeper insight into how financial knowledge is translated into saving practices and how healthcare expenditure and social support influence financial decision-making. Finally, future research could employ probability sampling and larger, more geographically diverse samples to improve the generalisability of the findings.

7. Conclusion

This study examined the socio-economic factors associated with financial resilience among older adults in Malaysia, with particular emphasis on the moderating role of saving behaviour. The findings demonstrate that saving behaviour has a strong positive relationship with financial resilience, while healthcare expenditure is negatively associated with resilience. In contrast, financial literacy and social support do not demonstrate statistically significant direct relationships with financial resilience within the study sample. The moderation analysis provides an additional contribution by demonstrating that saving behaviour significantly moderates the relationship between financial literacy and financial resilience. This finding suggests that the relationship between financial knowledge and financial resilience varies according to saving behaviour. However, saving behaviour does not significantly moderate the relationships between healthcare expenditure and financial resilience or between social support and financial resilience. These results indicate that the role of saving behaviour is conditional rather than uniform across the determinants examined. The findings also have implications for financial and social policy in the context of Malaysia's ageing population. Strengthening financial resilience may require a combination of individual financial capabilities, disciplined saving practices, healthcare-related financial protection, and appropriate social support. Within this broader policy context, Islamic finance and Islamic social finance mechanisms such as *Takaful*, *Waqf*, *Zakat*, and *Infaq* may offer potential complementary instruments for supporting older adults. However, these mechanisms were not empirically tested in this study and therefore represent policy-oriented propositions requiring further empirical assessment.

Overall, the study highlights the importance of viewing financial resilience among older adults as a multidimensional outcome shaped by both individual financial behaviour and broader financial and social conditions. The findings provide a foundation for future research to examine how saving practices, healthcare protection, social support, and Islamic social finance mechanisms can be integrated to strengthen financial resilience among Malaysia's ageing population.

5. Discussion of Results

The primary objective of this study was to examine the socio-economic and psychosocial determinants of financial resilience among older adults in Malaysia, while assessing the moderating role of saving behaviour. The structural model explains 51.8% of the variance in financial resilience ($R^2 = 0.518$), indicating moderate explanatory power. The findings show that healthcare expenditure and saving behaviour are significantly associated with financial resilience, whereas the direct relationships involving financial literacy and social support are non-significant. Furthermore, the moderation analysis indicates that saving behaviour significantly conditions the relationship between financial literacy and financial resilience, but does not significantly moderate the relationships between healthcare expenditure or social support and financial resilience.

5.1 Direct Relationships with Financial Resilience

The first hypothesis (H1) proposed a positive relationship between financial literacy and financial resilience. The results indicate a positive but non-significant relationship ($\beta = 0.062$, $t = 1.026$, $p = 0.305$), leading to the rejection

of H1. Although this finding differs from some previous studies associating financial literacy with improved financial well-being (Lusardi, 2019; Leung et al., 2022), it is consistent with the broader argument that financial knowledge does not necessarily translate into effective financial behaviour (Hilgert et al., 2003; O'Connor et al., 2019). For older adults, particularly those living on relatively fixed incomes and with limited opportunities to generate additional income, financial literacy alone may therefore be insufficient to strengthen financial resilience.

H2 proposed a negative relationship between healthcare expenditure and financial resilience. The results support this hypothesis ($\beta = -0.144$, $t = 2.746$, $p = 0.006$). This finding is consistent with research identifying medical expenditure shocks as an important source of household financial vulnerability (He & Zhou, 2022). Higher healthcare expenditure may reduce disposable income and weaken an individual's capacity to absorb subsequent financial shocks. The finding therefore highlights the importance of affordable healthcare and appropriate financial protection mechanisms for Malaysia's ageing population.

H3 proposed a positive relationship between saving behaviour and financial resilience. This hypothesis was strongly supported, with saving behaviour showing a significant positive relationship with financial resilience ($\beta = 0.654$, $t = 11.615$, $p < 0.001$). Consistent with previous research (Suh, 2022; Magli et al., 2022), disciplined saving practices and accumulated financial buffers can strengthen individuals' capacity to manage unexpected expenditures and financial shocks. Among the predictors examined in this study, saving behaviour has the largest standardised path coefficient, indicating that it is the strongest predictor of financial resilience in the estimated model.

H4 proposed a positive relationship between social support and financial resilience. The results indicate a positive but non-significant relationship ($\beta = 0.080$, $t = 1.718$, $p = 0.086$), resulting in the rejection of H4. This finding does not imply that social support is unimportant. Previous research has established its relevance to psychological well-being and resilience among older adults (Tadai et al., 2023; van der Meulen Rodgers et al., 2025). However, within the present model, social support may operate through indirect or non-financial channels, such as emotional reassurance, practical assistance, or episodic support during periods of difficulty, rather than through a direct and measurable relationship with financial resilience.

5.2 Moderating Effects

The moderation analysis provides further insight into the conditions under which the examined relationships may vary. H5 proposed that saving behaviour moderates the relationship between financial literacy and financial resilience. The interaction term is significant ($t = 2.321$, $p = 0.020$), supporting H5. This finding indicates that the relationship between financial literacy and financial resilience varies according to the level of saving behaviour. In particular, higher levels of saving behaviour appear to strengthen the positive relationship between financial literacy and financial resilience. This finding reinforces the distinction between possessing financial knowledge and translating that knowledge into financial behaviour (Hilgert et al., 2003).

H6 proposed that saving behaviour moderates the relationship between healthcare expenditure and financial resilience. The interaction term is not significant ($t = 0.902$, $p = 0.367$), leading to the rejection of H6. Although saving provides a general financial buffer, the findings suggest that saving behaviour does not significantly alter the negative relationship between healthcare expenditure and financial resilience within the study sample. This may indicate that healthcare-related financial pressures are influenced by factors extending beyond individual saving practices and may therefore require broader financial protection and social-policy responses.

Similarly, H7 proposed that saving behaviour moderates the relationship between social support and financial resilience. The interaction term is not significant ($t = 1.358$, $p = 0.175$), resulting in the rejection of H7. Thus, the relationship between social support and financial resilience does not appear to vary significantly according to saving behaviour. This suggests that the role of social support may operate through pathways that are relatively independent of individuals' saving practices.

5.3 Islamic Finance Policy Implications

While Islamic finance mechanisms were not empirically tested as variables in the present model, the findings provide a basis for discussing potential Shariah-compliant policy responses to the financial challenges identified among older adults.

First, the significant moderating role of saving behaviour highlights the importance of connecting financial education with accessible and practical saving opportunities. Islamic financial institutions could consider developing targeted Shariah-compliant savings products, using appropriate contractual structures, that are accessible to older adults. Such products may help facilitate the application of financial knowledge through actual saving behaviour. Second, the absence of a significant moderating effect of saving behaviour on the relationship between healthcare expenditure and financial resilience suggests that individual savings alone may not be sufficient to address healthcare-related financial pressures. Islamic social finance mechanisms, including Waqf, Zakat, and Takaful, may provide complementary forms of social and risk-sharing support. For example, health-oriented Waqf initiatives could contribute to subsidised community healthcare services, while appropriately

designed micro-Takaful arrangements could provide additional protection against severe or unexpected healthcare costs.

Third, although the direct relationship between social support and financial resilience was not statistically significant, social support remains relevant to the broader well-being of older adults. Instruments such as Infaq and Waqf could potentially help institutionalise community-based assistance and channel resources towards vulnerable older adults in a more structured and transparent manner. These Islamic finance mechanisms should therefore be viewed as potential complementary instruments rather than substitutes for individual saving, public healthcare provision, or existing social protection programmes. Their practical implementation would require further assessment of affordability, accessibility, governance, Shariah compliance, institutional capacity, and acceptance among older adults.

6. Contributions, Implications, and Future Research

This study contributes to the literature on financial resilience among older adults by conceptualising saving behaviour not only as a direct predictor but also as a potential moderating condition. The significant interaction between financial literacy and saving behaviour indicates that the relationship between financial knowledge and financial resilience is conditional on behavioural engagement with saving. This finding reinforces the distinction between possessing financial knowledge and applying that knowledge through actual financial behaviour. The study also highlights the importance of healthcare-related financial pressures in later life. The negative relationship between healthcare expenditure and financial resilience indicates that higher healthcare expenditure is associated with lower financial resilience among the sampled older adults. Moreover, the absence of a significant moderating effect of saving behaviour suggests that individual saving practices alone may not substantially alter this relationship. This finding points to the potential importance of complementary healthcare financing and social protection mechanisms.

From a practical perspective, the findings suggest that policymakers and financial institutions should consider moving beyond financial literacy initiatives that focus primarily on knowledge acquisition towards interventions that also facilitate the application of financial knowledge through saving. At the same time, Islamic social finance mechanisms, including Takaful, Waqf, Zakat, and Infaq, may provide complementary institutional pathways for addressing financial and healthcare vulnerabilities among older adults. However, these mechanisms were not empirically tested in this study and should therefore be regarded as policy-oriented propositions requiring further investigation.

Future research could extend the present study in several directions. First, further empirical research could examine the accessibility, adoption, affordability, and willingness of older adults to participate in specific Shariah-compliant mechanisms, such as health-related Waqf and micro-Takaful, thereby providing empirical evidence on the feasibility of Islamic finance-based interventions for strengthening financial resilience. Second, longitudinal studies could track saving behaviour and financial resilience over time to examine how sustained saving practices across the life course are associated with post-retirement financial resilience. Such research would provide greater insight into whether financial behaviours developed earlier in life continue to influence financial resilience during later life.

Qualitative research could also provide deeper understanding of the behavioural and psychosocial barriers that may prevent financial knowledge from being translated into active saving, while also exploring how social support networks operate during periods of financial difficulty. In addition, future studies could employ probability-based sampling across geographically and socio-economically diverse populations to improve the representativeness and generalisability of the findings. Finally, incorporating additional factors such as pension adequacy, debt burden, health insurance or Takaful coverage, digital financial capability, and access to formal financial services could provide a more comprehensive understanding of the determinants of financial resilience among Malaysia's ageing population.

7. Conclusion

This study investigated the socio-economic determinants of financial resilience among older adults in Malaysia, with particular emphasis on the moderating role of saving behaviour. The findings indicate that saving behaviour is strongly and positively associated with financial resilience, whereas healthcare expenditure is negatively associated with financial resilience. In contrast, financial literacy and social support do not exhibit significant direct relationships with financial resilience in the estimated model. Importantly, the moderation analysis indicates that saving behaviour significantly strengthens the relationship between financial literacy and financial resilience. This finding suggests that financial knowledge may be more closely associated with resilience when it is accompanied by active saving behaviour, highlighting the importance of translating financial knowledge into practical financial actions. However, saving behaviour does not significantly moderate the relationships between healthcare expenditure or social support and financial resilience.

These findings have important policy implications for Malaysia's ageing population. Strengthening financial resilience may require a combination of individual-level behavioural interventions, particularly those that

facilitate saving, and broader institutional mechanisms addressing healthcare and social protection needs. Within this broader framework, Islamic social finance mechanisms such as Takaful, Waqf, Zakat, and Infaq may offer potentially relevant complementary pathways for supporting vulnerable older adults. Nevertheless, these mechanisms were not empirically tested in the present study and should therefore be considered policy-oriented propositions rather than established empirical solutions. Overall, the study demonstrates that financial resilience among older adults is a multidimensional outcome shaped by both individual financial behaviour and broader economic and social conditions. Future research should empirically evaluate the feasibility and effectiveness of complementary Islamic finance and social protection mechanisms to determine how they can contribute to strengthening financial resilience among Malaysia's ageing population.

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Enhancing the Development of the Agricultural Sector through Waqf: Evidence from West Java, Indonesia

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Abstract

West Java's agricultural sector faces severe challenges, including limited institutional support, lack of technical expertise, environmental degradation, and market inefficiencies. This study evaluates how productive *waqf* can be integrated into agricultural financing to address these constraints. Utilising a mixed-methods design, the study combines qualitative expert interviews with an Analytic Network Process–Strengths, Weaknesses, Opportunities, and Threats (ANP-SWOT) framework. ANP prioritises critical challenges (RO1) and evaluates a *waqf*-based funding framework (RO2), while IFAS-EFAS matrices determine strategic positioning (RO3). The ANP analysis identifies unproductive *waqf* land as the most significant individual structural constraint (limiting weight: 0.1521). However, the support and expertise dimension scores highest overall when its constituent factors are aggregated (0.3862), indicating that stakeholders prioritise capacity building and knowledge transfer over immediate land reform. Experts prioritise systemic solutions such as *waqf-zakat* institutional integration (0.1239) and *salam-muzara'ah* contract implementation (0.1156). These priorities yield a Strength-Threat (S-T) strategic posture, leveraging *waqf*'s long-term stability against market volatility and climate risks. Ultimately, this study offers an empirically grounded framework that operationalises agricultural *waqf* as interest-free patient capital for land rehabilitation, technology adoption, and farmer empowerment in West Java, providing a potentially scalable model for broader regional implementation across Indonesia.

Keywords: Productive Waqf, Agricultural Financing, ANP-SWOT Analysis, West Java Agriculture

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1. Introduction

The agricultural sector plays a crucial role in Indonesia's economy by contributing significantly to national gross domestic product (GDP) and employing a substantial proportion of the population (Perdana et al., 2023; Husman & Sakti, 2021). Agriculture accounts for approximately 13% of national GDP and provides employment for about 32% of the labour force, while also supplying essential raw materials for domestic industry and export commodities (Bashir & Susetyo, 2018). Beyond its economic significance, the sector is vital for ensuring national food security, meeting the needs of a growing population, and supporting social stability and public health (Adam & Abdulai, 2023). Sustainable farming practices are therefore essential for

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enhancing productivity, ensuring access to nutritious food, reducing poverty, and protecting the environment. These objectives align closely with the United Nations Sustainable Development Goals (SDGs), which provide an internationally recognised framework for sustainable development, including sustainable land use, agriculture, and agroforestry (Odagiri et al., 2020; van Noordwijk et al., 2018).

West Java offers an important empirical setting for examining these issues. Agriculture remains a major source of livelihood in Indonesia, employing approximately 29.96% of the national workforce as of February 2022, according to the Central Statistics Agency (BPS). Given its fertile soils, high population density, and substantial contribution to national food production, West Java has been a major focus of agricultural development and grant initiatives implemented by various government institutions (Sabirin et al., 2022). However, the province's agricultural sector continues to face structural constraints that hinder productivity and long-term sustainability. Rural youth out-migration has reduced the available agricultural workforce, while smallholder farmers face low yields, poor product quality, environmental degradation, social tensions, and restricted access to formal capital. Approximately 30% of Indonesia's cropland is managed by smallholder farmers, who are particularly vulnerable to climate change and extreme weather conditions (Usman et al., 2025). Market constraints, inadequate post-harvest infrastructure, fragmented supply chains, weak stakeholder coordination, and low levels of technological adoption further constrain agricultural performance (Perdana et al., 2023; Usman et al., 2025).

Financing is a particularly critical constraint. Smallholder farmers often face difficulties accessing formal credit because of high perceived risks, stringent collateral requirements, and cumbersome administrative procedures (Mutisya & Kumar, 2025). Consequently, many depend on informal intermediaries and predatory lenders, weakening their bargaining position and increasing their economic vulnerability (Witt, 2021). Restricted financial access also limits farmers' ability to adopt modern technologies, improve productivity, and strengthen their resilience to climate- and market-related risks (Mutisya & Kumar, 2025; Witt, 2021). These interconnected challenges highlight the need for financing mechanisms that are accessible, sustainable, and capable of supporting both productive activities and long-term agricultural resilience. In this context, Islamic social finance, particularly *waqf*, offers a potential mechanism for supporting productive agricultural activities and generating sustainable social benefits (Othman et al., 2023; Agusti et al., 2025). Productive *waqf* can mobilise agricultural land and plantation assets to generate recurring returns while preserving the underlying endowment. Such returns can support farmer incomes and contribute to broader social investments in education, healthcare, and local infrastructure (Agusti et al., 2025). Thus, *waqf* can extend beyond its traditional philanthropic function to serve as a long-term, interest-free financing mechanism for agricultural development.

The relevance of this approach is particularly evident in Subang Regency, West Java, a major agricultural region experiencing increasing land-conversion pressures arising from national strategic projects and industrial expansion (Rizaldi et al., 2019; Gunawan et al., 2019; Pratama & Mandela, 2024). Empirical evidence demonstrates the feasibility of productive agricultural *waqf* in the region. For example, the Dompét Dhuafa Foundation manages approximately 10 hectares of productive *waqf* land in Cirangkong Village, Subang Regency, integrating crop cultivation and livestock production in collaboration with local farmers. The initiative has contributed to employment generation and food security. Nevertheless, Subang, which encompasses approximately 80,000 hectares of agricultural land supporting more than 176,073 rice farmers, remains exposed to land-conversion risks associated with large-scale infrastructure and industrial development, including the Patimban Port project (Rizaldi et al., 2019; Gunawan et al., 2019). These pressures reinforce the importance of farmland preservation and climate-smart agricultural practices in sustaining long-term regional food security (Pratama & Mandela, 2024). Despite these promising developments, significant research gaps remain concerning how agricultural challenges can be systematically prioritised and how structured *waqf*-based financing can be operationalised to address them. Existing initiatives demonstrate the potential of agricultural *waqf*, but further research is needed to identify the most critical constraints, translate these priorities into appropriate Islamic financing mechanisms, and determine strategic pathways for scaling such models. These gaps are examined further in the literature review (Section 2.7).

To address these gaps, this study pursues three primary research objectives. First, it aims to prioritise the socio-economic and financing challenges facing the agricultural sector in West Java using an integrated ANP-SWOT approach (RO1). Second, it seeks to develop a dedicated *waqf*-based agricultural funding framework grounded in the empirical findings of RO1 and incorporating appropriate Islamic contractual structures (*shariah*

contracts) (RO2). Third, it aims to formulate strategic recommendations for scaling up and replicating the West Java agricultural *waqf* framework across other agricultural regions in Indonesia (RO3).

2. Literature Review

2.1 The Condition of the Agricultural Sector in West Java

The agricultural sector plays a pivotal role in Indonesia's economy, contributing significantly to national output and employment while supplying critical industrial raw materials and export commodities (Perdana et al., 2023; Husman & Sakti, 2021; Bashir & Susetyo, 2018). Beyond its macroeconomic contribution, agriculture is essential for food security, rural livelihoods, and social stability (Adam & Abdulai, 2023). Within this national context, West Java represents one of Indonesia's strategically important agricultural regions because of its fertile land, high population density, and substantial contribution to national food production. Despite its strategic importance, the agricultural sector in West Java faces persistent structural and socio-economic constraints. Smallholder farmers, who manage approximately 30% of Indonesia's cropland, experience low productivity, poor crop quality, environmental degradation, and severely limited access to financial resources (Usman et al., 2025). Demographic changes, particularly the migration of rural youth to urban centres, further reduce agricultural labour availability and undermine the sector's long-term sustainability. Market and institutional inefficiencies also constrain agricultural performance through fragmented supply chains, weak stakeholder coordination, and over-reliance on intermediaries, which can diminish farmers' bargaining power and contribute to inefficient price formation (Perdana et al., 2023; Witt, 2021).

Limited access to formal financing represents a primary barrier to agricultural development. Smallholders often face stringent collateral requirements, high perceived credit risks, and complex administrative procedures that restrict their access to formal financial institutions (Mutisya & Kumar, 2025). Consequently, many depend on informal intermediaries and lenders, which can exacerbate their economic vulnerability and limit their capacity to invest in modern technologies and sustainable production systems (Witt, 2021). These challenges are further compounded by climate variability, water scarcity, land degradation, inadequate post-harvest infrastructure, and rapid land conversion driven by industrialisation and infrastructure development, particularly in Subang Regency (Rizaldi et al., 2019; Gunawan et al., 2019; Pratama & Mandela, 2024). Although existing studies document these challenges, they generally examine individual constraints rather than systematically assessing their relative importance and interdependencies. Consequently, policymakers and other stakeholders have limited empirical guidance regarding which constraints should be prioritised when designing targeted agricultural interventions. This gap highlights the need for a structured, multi-criteria decision-making approach, such as the Analytic Network Process (ANP), to identify and prioritise the most critical constraints within the agricultural sector.

2.2 The Development of Productive *Waqf* in Indonesia

Waqf is an important instrument of Islamic social finance that can support sustainable wealth redistribution and socio-economic development. Its defining feature is the preservation of the principal asset while generating continuous benefits for designated beneficiaries, thereby distinguishing it from purely consumptive forms of charity (Salam & Sutisna, 2024; Habibah et al., 2019). In Indonesia, *waqf* has gradually expanded beyond its traditional applications in mosques, schools, and burial grounds towards more productive uses, including commercial real estate and agriculture. Productive *waqf* involves the strategic management of endowed assets to generate income that can be reinvested or distributed for social welfare (Agusti et al., 2025; Othman et al., 2023). Its applications include agricultural land, commercial properties, and cash *waqf*, thereby shifting the focus from passive asset preservation towards productive value creation. In agriculture, this approach enables endowed land and financial resources to support productive activities while preserving the underlying *waqf* corpus.

The development of productive *waqf* in Indonesia is supported by a formal legal and institutional framework, anchored by Law No. 41 of 2004 on Waqf. The Indonesian Waqf Board (BWI) and various *nazhir* (*waqf* trustee) institutions play important roles in administering and developing *waqf* assets in accordance with *Sharia* principles. Financial innovations, including cash *waqf*, *waqf*-linked *sukuk*, and digital fundraising platforms, have also expanded opportunities for resource mobilisation and public participation (Ainol-Basirah & Siti-Nabiha, 2020; Kunhibava et al., 2023). Empirical initiatives further demonstrate the operational potential

of productive *waqf* for community empowerment. Agricultural projects implemented by institutions such as Dompet Dhuafa illustrate how *waqf* assets can be utilised for crop cultivation and livestock production while generating economic benefits for local communities. Such initiatives demonstrate the potential of *waqf* to function as long-term, patient capital for productive activities. Nevertheless, limitations in managerial capacity, underutilised assets, inadequate funding, and weak institutional coordination continue to constrain the broader development and scalability of productive *waqf* in Indonesia (Othman et al., 2023; Agusti et al., 2025). While the literature establishes the broader developmental potential of productive *waqf*, it provides limited operational guidance on how to structure sector-specific financing models tailored to smallholder agriculture. This limitation is particularly relevant when *waqf* is intended to address localised production, market, financing, and institutional constraints.

2.3 Application of *Waqf* in Agricultural Development

The application of *waqf* to agricultural development offers a potential mechanism for addressing structural constraints while generating sustained socio-economic benefits. Agricultural *waqf* involves the productive management of endowed land, financial resources, and infrastructure to support farming activities, food security, and rural livelihoods (Latifah, 2019; Ishak et al., 2025a). Because the principal asset is preserved while generating benefits over time, productive *waqf* is well aligned with the long-term nature of agricultural investment. One important application is the productive use of *waqf* land for crop cultivation, livestock farming, and agroforestry. The resulting outputs or revenues can support farmers and beneficiaries while preserving the underlying endowed asset (Agusti et al., 2025). Productive *waqf* can also facilitate the rehabilitation of idle or underutilised agricultural land, thereby improve land productivity and promote sustainable land management (Odagiri et al., 2020; van Noordwijk et al., 2018). This land-based function is particularly relevant in regions where agricultural land is increasingly threatened by competing commercial and infrastructural uses.

In addition to land-based assets, cash *waqf* can provide non-debt financing for agricultural inputs, technology, infrastructure, and other production requirements (Othman et al., 2023). Islamic contractual mechanisms such as *salam* (forward sales) and *muzara'ah* (sharecropping) can complement *waqf* funding by structuring financing, production, and risk-sharing relationships between smallholders and *waqf* institutions. Such arrangements may provide alternatives for smallholders who face difficulties accessing conventional formal credit markets (Mutisya & Kumar, 2025). However, effective agricultural *waqf* requires robust governance and professional management. *Nazhir* institutions must possess adequate technical and financial capacity to manage physical assets, coordinate stakeholders, administer contractual arrangements, and maintain *Sharia* compliance (Habibah et al., 2019). Digitalisation, corporate *waqf* frameworks, and integration with other Islamic social finance instruments may further strengthen resource mobilisation, transparency, and operational efficiency (Ainol-Basirah & Siti-Nabiha, 2020; Kunhibava et al., 2023).

Although existing literature demonstrates the potential of *waqf* in agriculture, limited attention has been given to aligning specific Islamic financial contracts with empirically prioritised agricultural constraints. In particular, the operational integration of *salam* and *muzara'ah* within a unified *waqf* framework based on identified smallholder needs remains insufficiently explored.

2.4 Potential and Challenges of Agricultural *Waqf* in West Java

West Java presents a favourable context for agricultural *waqf* because of its extensive agricultural base, fertile land, and important role in national food production. Integrating *waqf* into regional agricultural development is consistent with broader objectives concerning food security, poverty reduction, and environmental sustainability (Odagiri et al., 2020; van Noordwijk et al., 2018). Productive *waqf* can mobilise long-term, interest-free capital while facilitating the productive use of idle or underutilised agricultural land (Othman et al., 2023; Agusti et al., 2025). Nevertheless, the development of agricultural *waqf* in West Java is constrained by several interrelated challenges. Market and distribution constraints include fragmented supply chains, uncertain market absorption, over-reliance on middlemen, and weak coordination between farmers and end markets. These conditions can restrict profit margins, weaken farmers' bargaining positions, and limit the benefits generated from increased agricultural production (Perdana et al., 2023; Witt, 2021). Accordingly, financial capital alone may not be sufficient to generate sustainable improvements unless market access and distribution mechanisms are addressed simultaneously.

Support and expertise represent another important dimension. Low rates of technology adoption, inadequate extension services, insufficient technical training, and weak institutional support can hinder farmers' productivity and their ability to adopt improved production practices (Perdana et al., 2023; Pratama & Mandela, 2024). Limited collaboration between agricultural organisations and *waqf* institutions may further constrain the development of agricultural *waqf* initiatives. These conditions suggest that financial intervention should be accompanied by capacity building, knowledge transfer, and institutional coordination. Environmental and resource-management pressures also threaten the sustainability of agricultural activities. Climate variability, water scarcity, land degradation, and land conversion associated with industrialisation and infrastructure development can reduce agricultural land availability and undermine long-term production. These pressures are particularly relevant in areas such as Subang Regency, where competing land uses may threaten agricultural sustainability and regional food security (Rizaldi et al., 2019; Gunawan et al., 2019; Pratama & Mandela, 2024). While the literature identifies challenges across market, technical, institutional, and environmental dimensions, these issues are generally examined separately. A systematic assessment of their relative importance and interdependencies is therefore necessary to inform the design of an effective and targeted *waqf*-based agricultural financing strategy.

2.5 Governance and Institutional Capacity of *Waqf*

Effective governance is fundamental to the sustainability of *waqf* institutions, particularly as endowed assets are transformed from passive charitable holdings into productive socio-economic resources. *Waqf* governance encompasses the regulatory frameworks, institutional mechanisms, and managerial practices required to safeguard and develop endowed assets in accordance with *Sharia* principles (Habibah et al., 2019; Salam & Sutisna, 2024). Within this framework, the *nazhir* is responsible for managing and developing *waqf* assets without assuming individual ownership of the endowed property. Institutional capacity encompasses the managerial competence, technical expertise, financial capability, organisational infrastructure, and strategic planning required to develop and scale *waqf* initiatives (Ainol-Basirah & Siti-Nabiha, 2020; Kunhibava et al., 2023). Indonesia's Law No. 41 of 2004 provides the legal foundation for *waqf* governance, while BWI performs important supervisory and coordinating functions. However, persistent limitations in human capital, technology adoption, professional management, and strategic planning can hinder the productive utilisation and development of *waqf* assets. Institutional integration and managerial innovation are therefore important for strengthening agricultural *waqf*. Digital platforms, corporate governance practices, and integration with other Islamic social finance instruments, such as *zakat* and cash *waqf*, can enhance transparency, resource mobilisation, and operational efficiency (Ainol-Basirah & Siti-Nabiha, 2020; Kunhibava et al., 2023). In agricultural *waqf*, these capabilities are particularly important because effective land and financial management require coordination among *nazhir*, smallholders, financial institutions, government agencies, and market actors (Othman et al., 2023; Agusti et al., 2025). Rather than treating governance as an isolated administrative issue, this study considers institutional capacity as an interconnected element within the broader ecosystem of agricultural constraints. This perspective is consistent with the study's use of ANP to assess the relative importance and interrelationships among the challenges affecting agricultural *waqf* development.

2.6 Integrative Theoretical Framework

This study adopts an integrative theoretical framework combining normative Islamic principles with economic, behavioural, market, and institutional perspectives to examine agricultural development and the role of *waqf* in West Java. The normative foundation is provided by *Maqasid al-Shariah*, which emphasises the protection of essential human interests, including life, property, and socio-economic welfare (Chapra, 2016). From this perspective, agricultural *waqf* is not merely a charitable mechanism but a socially embedded financial instrument that can promote economic justice, support vulnerable smallholders, and contribute to sustainable community welfare (Salam & Sutisna, 2024; Habibah et al., 2019). This normative foundation is complemented by Agribusiness Systems Theory, which conceptualises agriculture as an interconnected system involving production, processing, distribution, and marketing. This perspective is relevant because agricultural challenges in West Java extend beyond farm-level production to include supply-chain inefficiencies, market absorption barriers, and coordination problems (Perdana et al., 2023). Imperfect Market Theory provides a complementary explanation of how information asymmetry and unequal market power can disadvantage smallholders and

contribute to inefficient market outcomes (Witt, 2021). Behavioural Economics offers a micro-level perspective on smallholder decision-making under conditions of risk, uncertainty, and financial pressure. Finally, Dynamic Capabilities Theory highlights the importance of organisational adaptation, learning, and innovation in enabling *nazhir* institutions to respond to changing technological, market, and environmental conditions (Ainol-Basirah & Siti-Nabiha, 2020).

Productive *waqf* serves as the unifying instrument linking these normative, economic, behavioural, and institutional perspectives. By mobilising endowed land, interest-free financial resources, and appropriate governance mechanisms, *waqf* can help address financing constraints while supporting productive investment, institutional capacity, and sustainable agricultural development (Othman et al., 2023; Agusti et al., 2025). Taken together, these perspectives provide a conceptual basis for examining agricultural *waqf* as an interconnected system rather than as a standalone financing mechanism.

2.7 Existing Research Gaps

Despite the expanding literature on Islamic social finance and agricultural development in Indonesia, several important research gaps remain. First, previous studies identify agricultural constraints such as climate vulnerability, infrastructure deficits, market fragmentation, and limited financing, but have generally not systematically ranked these constraints according to their relative importance and interdependencies (Perdana et al., 2023; Usman et al., 2025). Consequently, there remains limited empirical evidence regarding which constraints should receive priority within a regional context such as West Java. Second, although the developmental potential of productive *waqf* has been widely recognised, existing literature provides limited operational guidance on financing models specifically tailored to smallholder agriculture. In particular, insufficient attention has been given to integrating Islamic contractual mechanisms, such as *salam* and *muzara'ah*, with empirically prioritised agricultural needs (Othman et al., 2023; Agusti et al., 2025). This limits the practical translation of the broader *waqf* concept into context-specific agricultural financing arrangements. Third, existing research rarely integrates agricultural constraint identification, *waqf*-based financing design, and strategic implementation within a single analytical framework. Studies applying multi-criteria decision-making approaches such as ANP to *waqf* have generally focused on broader governance priorities rather than agricultural sector constraints. For example, Huda et al. (2017) applied ANP to prioritise key challenges in *waqf* management in Indonesia, but their analysis was not specifically focused on agricultural *waqf*. Similarly, the *Salam–Muzara'ah* Linked Waqf (SMW) model proposed by Majid (2021) provides a conceptual financing structure integrating *salam*, *muzara'ah*, and cash *waqf*, but does not employ an empirical prioritisation procedure to determine which agricultural constraints should be addressed first.

These limitations indicate the need for an integrated empirical and strategic approach. Accordingly, this study combines ANP to prioritise the relative importance and interdependencies of agricultural constraints with IFAS-EFAS analysis to determine the strategic position of agricultural *waqf*. The resulting priorities then inform the development of a context-specific *waqf*-based agricultural financing framework for West Java, including appropriate Islamic contractual mechanisms. In this way, the study connects empirical constraint prioritisation with financing design and strategic recommendations, while providing a framework with potential for replication in other agricultural regions of Indonesia.

3. Conceptual Framework

The conceptual framework of this study illustrates the logical relationship between the theoretical foundations, empirical investigation, analytical stages, and expected research outputs. Figure 1 illustrates the overall conceptual framework, which begins with the identification of key agricultural challenges and the potential of productive *waqf* in West Java through a literature review, document analysis, and expert interviews. These sources provide the empirical basis for understanding agricultural underdevelopment as a complex and interconnected problem involving financing constraints, market inefficiencies, institutional weaknesses, limited technical support, and environmental pressures.

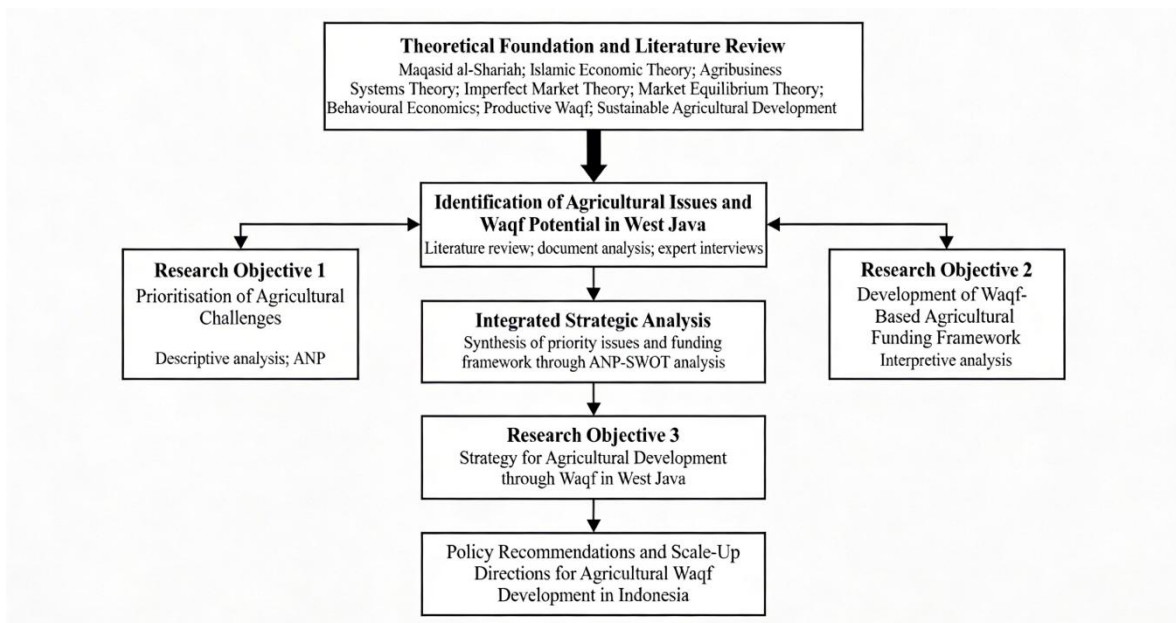


Figure 1: Conceptual Framework

The framework is grounded in an integrative theoretical foundation, including *Maqasid al-Shariah*, Islamic economic thought, agribusiness systems theory, imperfect market theory, market equilibrium theory, behavioural economics, and productive *waqf* principles within sustainable development. Rather than functioning as independent causal theories, these perspectives collectively provide the normative foundation and analytical lens for the identification, interpretation, and integration of the factors examined in this study.

Building on this foundation, the framework proceeds through two complementary analytical stages aligned with the research objectives. The first stage identifies and prioritises agricultural challenges using descriptive analysis and the Analytic Network Process (ANP), establishing their relative importance and network interdependencies to determine which constraints should receive priority intervention. The second stage develops a *waqf*-based agricultural financing framework using descriptive and interpretive analysis, incorporating empirically identified smallholder needs, relevant *Shariah*-compliant financial mechanisms such as *salam* and *muzara'ah*, and appropriate institutional arrangements.

As illustrated in Figure 1, the outputs of these analytical stages are subsequently integrated through ANP-SWOT analysis and IFAS-EFAS matrices to establish the strategic position of agricultural *waqf* and formulate appropriate development strategies. In this process, the ANP results provide empirically prioritised inputs for assessing internal and external factors, while the financing framework provides potential financing and contractual mechanisms for addressing the identified constraints. Ultimately, the conceptual framework establishes a sequential progression from theoretical foundations and empirical investigation to analytical prioritisation, framework design, and strategic recommendations for advancing productive agricultural *waqf* in West Java and across Indonesia.

4. Research Methodology

This study adopts a sequential mixed-methods design integrating qualitative exploration, multi-criteria decision analysis, and strategic evaluation to develop a *waqf*-based agricultural financing framework for West Java. The methodology is structured to ensure a logical progression from problem identification and prioritisation to framework design and strategic analysis. Given the inherent complexity of agricultural systems—characterised by structural interdependencies among market, institutional, environmental, and financial factors—the study

combines qualitative and quantitative analytical techniques to enhance analytical robustness and contextual relevance.

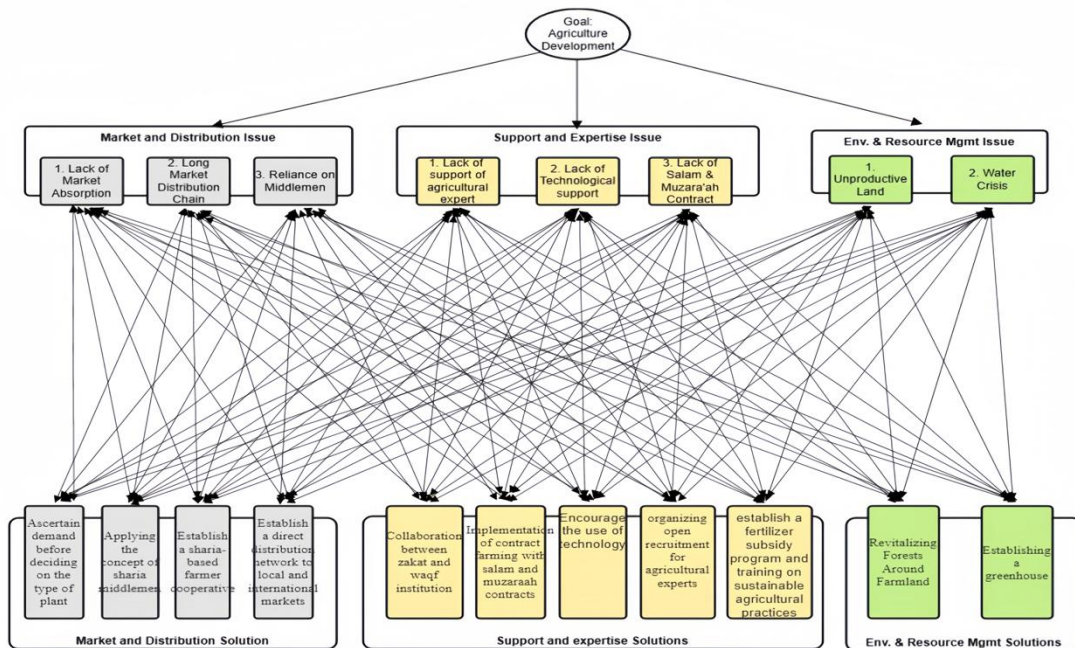
In the first stage, qualitative exploratory methods are employed to identify key variables underlying agricultural challenges and the operational potential of *waqf*. This involves a comprehensive literature review, document analysis, and semi-structured interviews with six purposively selected experts, comprising two academics, two practitioners, and two policymakers (see Table 1 for expert profiles). Expert selection was guided by three explicit criteria: first, a minimum of five years of professional experience in agriculture, Islamic finance, or *waqf* management; second, direct involvement in, or strategic oversight of, productive *waqf* and agricultural development initiatives in West Java, representing institutional (Indonesian Waqf Board/BWI), regional government (Bappeda), academic, and field-implementation perspectives; and third, equal representation across academic, practitioner, and policy domains to minimise single-perspective bias during the pairwise comparison process. This expert panel composition aligns with the methodological requirements of the Analytic Network Process (ANP), wherein the relevance, depth of experience, and domain diversity of expert judgements are important for deriving reliable priority weights (Saaty, 2008).

Table 1. Justifications of Informant Selection

Code	Category	Position / Affiliation	Years of Experience	Specific Involvement in Agricultural Waqf / Subang
E1	Academic	Dean, Faculty of Economics, YARSI University; Chair of the Professional Certification Unit, Indonesian Waqf Board (BWI)	5+ years	Strategic role in national waqf development and professional standard-setting through the Indonesian Waqf Board (BWI), with expertise in Islamic economics and finance.
E2	Academic	Lecturer and Head of Administration and Finance, Department of Islamic Banking and Economics; Deputy Secretary, Indonesian Waqf Board (BWI)	5+ years	Extensive experience in financial management and waqf development within the higher education sector, supported by expertise in Islamic economics and waqf governance.
E3	Policymaker	Head of Planning, Research and Development Division, Regional Development Planning Agency (Bappeda), West Java	5+ years	Responsible for regional development planning relevant to agricultural development, including the integration of waqf into regional economic development strategies.
E4	Policymaker	Head of Industrial Development Planning for Trade, Cooperatives, and SMEs, Regional Development Planning Agency (Bappeda), West Java	5+ years	Involved in policy formulation for industrial and regional economic development, including programmes supporting productive waqf and local economic initiatives.
E5	Practitioner	Head of the Department of Sharia Economics, IPB University; Founder of Hutan Waqf Bogor	5+ years	Direct experience in implementing forestry- and environment-based productive waqf, combined with academic expertise in Islamic economics and sustainable resource management.
E6	Practitioner	Founder of Trubus Agricultural Waqf	5+ years	Extensive field experience in the management of productive agricultural waqf land and the

The results of this stage are synthesised into a structured ANP model comprising clusters and elements that represent the major agricultural challenges, including market and distribution, environmental and resource management, and support and expertise, together with potential solutions within the agricultural *waqf* ecosystem.

Figure 2. Analytic Network Process (ANP) Framework



The second stage utilises the Analytic Network Process (ANP) to prioritise the identified variables through pairwise comparison analysis. In this procedure, experts evaluate the relative importance of each element within and across clusters using Saaty's 1–9 fundamental scale, allowing both direct and indirect interdependencies among factors to be captured. The resulting pairwise comparison matrices are processed to derive priority weights (eigenvectors), while consistency ratios (CR) are calculated for each matrix using Super Decisions software to assess the logical consistency of expert judgements, adhering to Saaty's standard threshold of $CR \leq 0.10$. Across all six experts, the CR values for the pairwise comparisons ranged from 0.00394 to 0.00932 (mean = 0.0071), falling well below the acceptable threshold. These consistently low inconsistency levels demonstrate a high degree of logical coherence in the expert evaluations, thereby supporting the reliability of the derived priority weights used in the subsequent ANP and ANP-SWOT analyses (see Table 2).

Table 2. Inconsistency (CR) Table

No	Expert	Inconsistency (CR)
1	Expert 1	0.00932
2	Expert 2	0.00932
3	Expert 3	0.00394
4	Expert 4	0.00755

5	Expert 5	0.00494
6	Expert 6	0.00755

In the third stage, the study applies interpretive and descriptive analysis to translate the ANP results into a *waqf*-based agricultural financing framework. The prioritised variables provide the foundation for designing the framework architecture, including forms of *waqf* capital (such as cash *waqf* and land *waqf*), contractual mechanisms (such as *salam* and *muzara'ah*), institutional roles (involving *nazhir* institutions, smallholders, and financial intermediaries), and operational workflows. This stage ensures that the proposed framework is empirically grounded while remaining aligned with *Shariah* principles and the practical agricultural needs of West Java.

Finally, the study employs an integrated ANP-SWOT approach incorporating Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) matrices to evaluate the strategic positioning of the proposed framework. The IFAS matrix assesses internal strengths and weaknesses, while the EFAS matrix evaluates external opportunities and threats. Each factor is assigned a weight and rating based on its relative significance, informed by the ANP priority results and expert evaluations. The weighted scores are then aggregated to determine the framework's overall strategic position within the SWOT matrix.

The ANP results determine which factors are mapped into the IFAS and EFAS matrices as strengths, weaknesses, opportunities, and threats. Following the initial ANP analysis, a second round of expert interviews is conducted to evaluate the relative significance of each identified SWOT factor. Each factor is assigned a significance level using a three-point scale: 3 for highly significant, 2 for moderately significant, and 1 for less significant. The overall significance score for each factor is derived by calculating the mean rating across the six experts and rounding to the nearest integer. These significance levels are subsequently normalised by dividing each score by the total sum of significance ratings to establish the respective IFAS and EFAS weights, ensuring that the weights sum to 1.00.

This integrative analysis enables the formulation of targeted strategies that align internal capabilities with external conditions, thereby supporting the operational feasibility, sustainability, and scalability of agricultural *waqf* implementation in West Java and across Indonesia.

5. Results and Discussion

5.1 RO1: Examining Socio-Economic and Financing Challenges in West Java's Agricultural Sector Using an ANP-SWOT Approach

Before evaluating the priority weights, it is essential to establish the logical consistency of the pairwise comparison process. As presented in Table 2, all pairwise comparison matrices satisfy Saaty's recommended consistency threshold ($CR \leq 0.10$). The consistency ratios across the six experts ranged from 0.00394 to 0.00932, with a mean value of 0.0071, indicating a high level of logical coherence in the expert judgements. The corresponding outputs generated using Super Decisions software are provided in Appendix 1. These results support the consistency of the expert evaluations underlying the priority weights presented in the subsequent analysis. West Java's agricultural sector is characterised by persistent structural inefficiencies that can be interpreted through the integration of Imperfect Market Theory, Agribusiness Systems Theory, and Behavioural Economics. These theoretical perspectives indicate that information asymmetry, supply-chain fragmentation, and behavioural constraints collectively contribute to market failures that disadvantage smallholder farmers. The dominance of informal intermediaries reflects imperfect market conditions in which middlemen exert substantial influence over price formation, potentially resulting in lower farm-gate prices and reduced farmer welfare. From an agribusiness systems perspective, elongated distribution chains represent structural bottlenecks that constrain market responsiveness and operational efficiency. Furthermore, behavioural economics provides insight into farmers' tendency towards distress selling under liquidity constraints and post-harvest loss risks, which may reinforce suboptimal economic outcomes.

A critical manifestation of these structural vulnerabilities is the uncertainty surrounding market absorption, which may discourage smallholders from investing in high-quality inputs such as certified seeds and advanced fertilisers. This market absorption risk is compounded by demand volatility, asymmetric market information, and poor supply-chain coordination. Infrastructure deficits further aggravate these conditions by increasing smallholder reliance on intermediaries for market access. The prioritisation analysis of market and distribution

challenges, presented in Figure 3, demonstrates moderate inter-rater agreement among experts, with a Kendall's coefficient of concordance (W) of approximately 0.44. This indicates a moderate degree of agreement across academic, policy, and practitioner domains regarding the relative importance of the identified market and distribution bottlenecks.

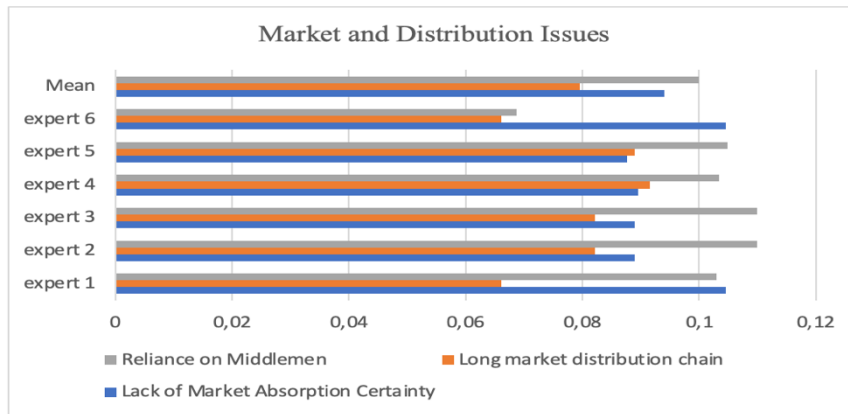


Figure 3. Prioritization of Market and Distribution Issues Based on Experts' Opinions

The ranking of market and distribution issues shows that reliance on middlemen is the most critical constraint, followed by the lack of market absorption certainty and long distribution chains. Specifically, reliance on middlemen recorded priority weights of 0.1065 among academics, 0.0940 among policymakers, and 0.1049 among practitioners, placing it at rank 1. The lack of market absorption certainty followed, with weights of 0.0968, 0.0943, and 0.0876, while long distribution chains ranked third, with values of 0.0742, 0.0800, and 0.0890, respectively. The combined priority weights further confirm that reliance on middlemen (0.3054) and lack of market absorption certainty (0.2787) are the two dominant issues within this cluster. Dependence on middlemen creates a systemic imbalance that may perpetuate inequality within the agricultural sector, a condition that can be interpreted through Imperfect Market Theory and information asymmetry frameworks. In such markets, unequal access to information may enable intermediaries to exercise disproportionate influence over pricing and distribution, creating conditions resembling monopsony at the farm-gate level (Geromichalos & Herrenbrueck, 2025). Smallholders, particularly in remote rural areas, occupy structurally weak bargaining positions because of limited access to real-time market information and alternative off-takers. Consequently, farm-gate prices may deviate from competitive market outcomes, reflecting structural power asymmetries rather than underlying supply-and-demand conditions.

Furthermore, behavioural economics provides key insights into why this structural dependency may persist despite its adverse economic consequences. Smallholders frequently face immediate liquidity constraints and post-harvest risks, prompting them to accept lower prices from intermediaries in exchange for immediate cash flow. This behaviour can be interpreted through concepts such as loss aversion and bounded rationality, whereby economic decisions under severe financial pressure may prioritise risk mitigation over long-term profit maximisation (Thaler, 2016). Consequently, even when alternative distribution channels exist, smallholders may opt for the perceived certainty provided by middlemen and informal lenders, particularly where these roles overlap, thereby reinforcing economic dependency and constraining longer-term growth. These theoretical insights are consistent with empirical literature on developing-country agricultural economies. Evidence demonstrates that reliance on informal intermediaries may restrict farm income, reduce capital investment, and impede technology adoption (Fabregas et al., 2019). In Indonesia, this dynamic may be further reinforced because middlemen frequently also provide informal credit. Their dual role as commercial buyers and informal credit providers embeds them more deeply within rural economic relationships, thereby linking market absorption uncertainty with intermediary control over distribution channels.

The second major cluster encompasses support and expertise constraints, which can be examined using

Dynamic Capabilities Theory, the Technology Acceptance Model (TAM), and the Diffusion of Innovation framework. These perspectives highlight those agricultural bottlenecks stem not only from individual smallholder limitations but also from systemic deficits in institutional support, extension services, and knowledge transfer. As presented in Figure 4, the prioritisation analysis for this cluster demonstrates a moderate level of agreement among experts, with a Kendall's coefficient of concordance (W) of approximately 0.36.

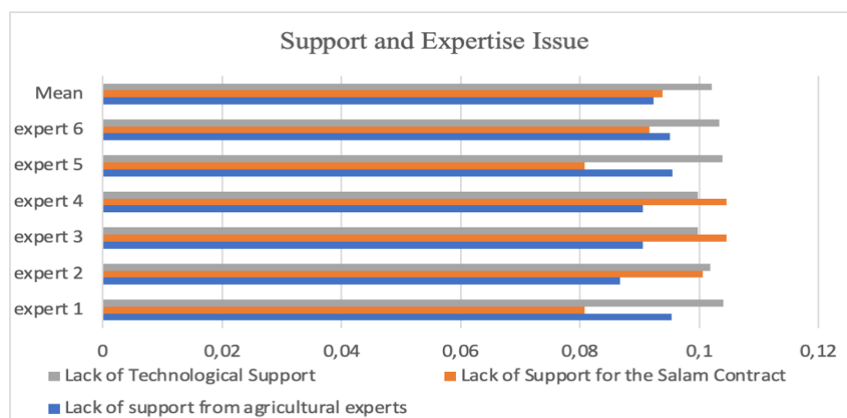


Figure 4. Prioritization of Support and Expertise Issues Based on Experts' Opinions

The prioritisation of support and expertise issues is presented in Table 5.3, where lack of technological support is identified as the primary constraint, followed by weak implementation support for *salam* contracts and lack of support from agricultural experts. The priority weights for lack of technological support are 0.1029 among academics, 0.1012 among policymakers, and 0.1034 among practitioners, placing it at rank 1. Weak implementation support for *salam* contracts follows, with weights of 0.0907, 0.1033, and 0.0917, while lack of support from agricultural experts ranks third, with values of 0.0911, 0.0921, and 0.0951, respectively. The combined priority weights further confirm that lack of technological support (0.3074) and weak *salam* contract implementation (0.2856) are the two most critical bottlenecks within this cluster.

The structural and technological constraints in Indonesia's agricultural sector can be interpreted through the *Maqasid al-Shariah* framework, particularly its emphasis on the preservation of wealth (*hifz al-mal*) and promotion of human welfare (*maslahah*). Restricted access to technology, unequal market structures, and weak bargaining power among smallholders may undermine distributive justice when economic returns are inequitably distributed across value-chain actors. In this regard, *Maqasid al-Shariah* provides a moral and economic foundation for inclusive agricultural transformation by emphasising fair access to resources, knowledge, and market opportunities. Chapra (2016) and Dusuki and Abdullah (2007) argue that Islamic economic principles support socio-economic equity and poverty alleviation through appropriate institutional arrangements. In the agricultural context, Hasan et al. (2024) further highlight that strengthening *waqf*-based financing and digital inclusion is consistent with *maqasid* objectives by enhancing smallholder productivity, income stability, and long-term welfare.

From a mainstream economic perspective, these structural inefficiencies can be further evaluated through Market Equilibrium Theory. Under competitive market conditions, prices reflect the interaction of supply and demand to facilitate efficient resource allocation. However, information asymmetry, market fragmentation, and intermediary dominance can distort agricultural market outcomes. Smallholders' limited access to real-time market data and digital platforms may weaken their price-negotiation capacity, potentially resulting in market outcomes that favour informal intermediaries. Empirical findings by Bellemare and Bloem (2018) and Li and Jiang (2023) indicate that improved access to information technology can reduce transaction frictions and enhance market efficiency. Accordingly, integrating technological innovation within an institutional framework guided by *maqasid* and sustainability principles may help reduce market distortions, expand smallholder market access, and foster a more equitable agricultural ecosystem. This synthesis aligns closely

with the core principles of Sustainable Agricultural Development, which emphasise economic viability, social equity, and environmental stewardship. Low rates of technology adoption constrain productivity and restrict smallholders' capacity to implement modern sustainable practices, such as precision agriculture and efficient resource management. Pretty et al. (2018) and FAO (2021) emphasise that sustainable agricultural transformation requires integrated support systems incorporating digital innovation, technical capacity building, and institutional strengthening. In the absence of such systems, smallholders may remain in low-productivity cycles that exacerbate rural poverty and environmental pressures. Thus, *maqasid* objectives and sustainable development principles converge on the necessity of equitable access to technology and institutional support to build resilient agricultural systems.

The third major cluster encompasses environmental and resource management constraints, which are critical for long-term agricultural sustainability. As presented in Figure 5, the expert evaluations demonstrate complete consensus, with a Kendall's coefficient of concordance (W) of 1.00. The prioritisation results in Table 5.4 identify unproductive land as the primary environmental and resource-management issue, followed by water scarcity. Unproductive land records mean priority weights of 0.1133 among academics, 0.1122 among policymakers, and 0.1170 among practitioners, generating a combined priority weight of 0.3425. Water scarcity records mean values of 0.0623, 0.0666, and 0.0673, respectively, yielding a combined priority weight of 0.1961.

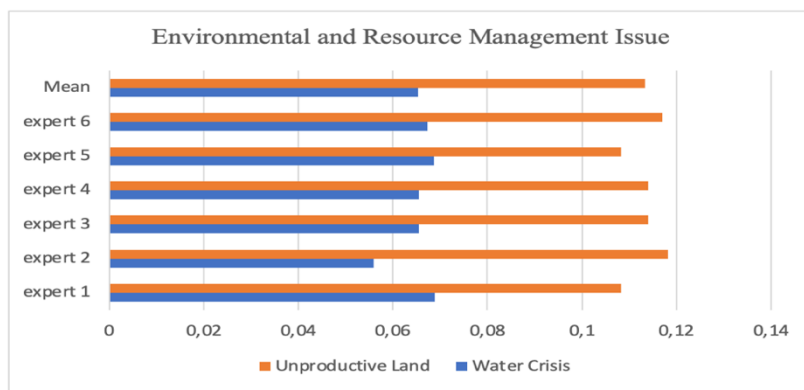


Figure 5. Prioritization of Environmental and Resource Management Issues Based on Experts' Opinions

Empirical data demonstrate a significant decline in agricultural land area and overall crop production. According to Statistics Indonesia (BPS, 2024), the harvested area in West Java contracted from 1,707,253 hectares in 2018 to 1,470,616 hectares in 2024, representing a loss of 236,637 hectares (13.86%). Similarly, agricultural output fluctuated over the same period, peaking at 9,433,723 tonnes in 2022 before falling to 8,514,667 tonnes in 2024. These trends reflect persistent structural and environmental bottlenecks, including agricultural land conversion, climate variability, and socio-economic pressures. These environmental and structural challenges can be interpreted through a productive *waqf* framework, which emphasises the optimal and sustainable utilisation of endowed assets to generate continuous socio-economic benefits. From this perspective, the conversion of agricultural land and degradation of water resources represent not only economic inefficiencies but also potential tensions with the *maqasid*-oriented objective of preserving productive assets for public welfare (*maslahah*). Productive *waqf* can provide an institutional mechanism for safeguarding endowed agricultural land by maintaining its productive use while generating benefits for smallholders and local communities. Historical analyses by Kahf (2003) and Cizakca (2011) highlight the role of *waqf* institutions in supporting agricultural land, irrigation infrastructure, and rural livelihoods. Furthermore, recent studies by Parveez et al. (2020) and Haneef et al. (2021) indicate that integrating *waqf* with modern agricultural financing mechanisms, such as cash *waqf*-linked farming initiatives, can strengthen investment capacity and contribute to rural socio-economic development. In this context, productive *waqf* can help address agricultural constraints by mobilising underutilised assets and directing resources towards climate-resilient infrastructure and community-based farming systems.

Simultaneously, these resource bottlenecks align closely with the principles of Sustainable Agricultural

Development, particularly regarding environmental resilience and efficient resource stewardship. Increasing drought risks, water scarcity, and reliance on rain-fed agriculture indicate gaps in sustainable water governance and climate-adaptive farming. Pretty et al. (2018) and FAO (2021) emphasise that sustainable agricultural transformation requires integrated water-resource management, investment in irrigation infrastructure, and the adoption of climate-smart technologies to improve productivity while conserving natural capital. The framework of common-pool resource management, as discussed by Dipierri et al. (2020), further explains how weak institutional governance can contribute to the depletion of shared water resources, thereby exacerbating scarcity and compromising long-term agricultural viability. Empirical evidence from Rockström et al. (2017) and Burney et al. (2013) indicates that improved water management and targeted technological interventions can enhance land productivity and climate resilience in drought-prone regions. Consequently, sustainable agricultural development and productive *waqf* converge on institutional innovation, resource efficiency, and long-term asset stewardship as complementary approaches to addressing land conversion, water scarcity, and declining agricultural productivity.

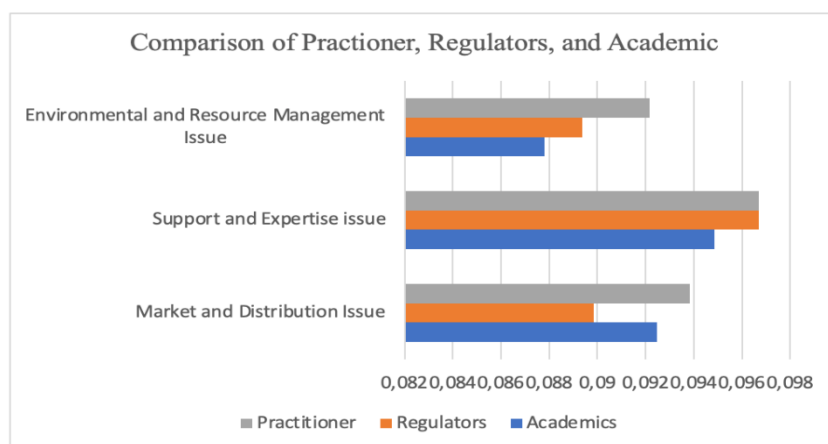


Figure 6. Mean Values for All Aspects of Agricultural Issues

Based on the mean values across the three informant groups—academics, policymakers, and practitioners—presented in Figure 6, the support and expertise dimension (0.0960) emerges as the most highly prioritised cluster from the stakeholders' perspective. This finding indicates that capacity-related constraints, particularly technological support, *salam-muzara'ah* contract implementation, and training and expert support, represent the most immediate operational bottlenecks facing smallholder farmers. While these groups mean values capture stakeholders' direct perceptions of the relative importance of individual issues, they do not fully account for their structural influence within the overall decision-making network. The ANP limiting weights, by contrast, incorporate the underlying network structure and feedback interdependencies among the identified factors, thereby providing a more comprehensive measure of systemic priority (see Figure 7).

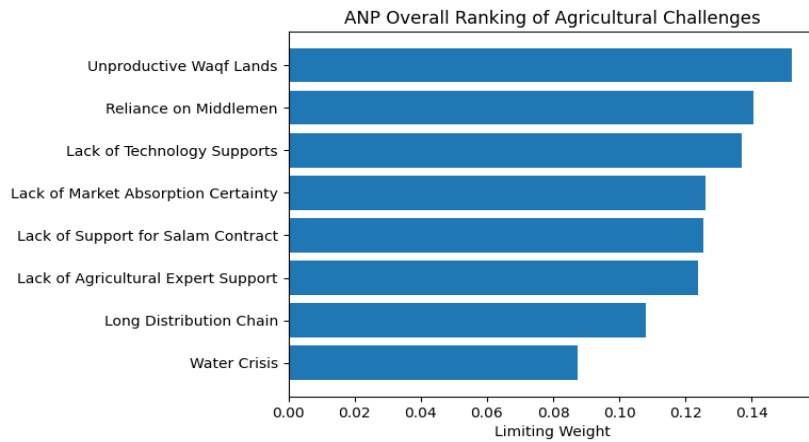


Figure 7. ANP Overall Ranking

Figure 7 presents the comprehensive ANP-based ranking, depicting the relative priority of agricultural challenges in West Java across multiple interrelated dimensions. The results indicate that unproductive *waqf* land constitutes the most critical individual structural constraint, recording the highest limiting weight (0.1521). This finding indicates that land inefficiency and asset underutilisation represent a major structural bottleneck within the regional agricultural system, with potential implications for crop productivity, yield stability, and long-term sector sustainability. The second-ranked constraint, reliance on middlemen (0.1405), highlights persistent structural challenges within the agricultural market network. This dependency reflects power asymmetries along the value chain; wherein informal intermediaries may exert substantial influence over price discovery and distribution channels. Consequently, smallholders may occupy structurally weaker bargaining positions and capture a smaller share of final market value, potentially reinforcing rural income disparities and systemic inefficiencies. Closely following, lack of technological support (0.1371) emerges as the third major constraint, indicating that low rates of technology adoption and underdeveloped digital infrastructure may constrain smallholder productivity. This result suggests that regional agricultural inefficiencies stem not only from market conditions but also from technological and capability gaps that may impede efficient production and post-harvest management.

Lack of market absorption certainty (0.1260) ranks fourth, reflecting demand uncertainty and weak supply-chain integration. This uncertainty may restrict smallholders' ability to plan cultivation cycles effectively and contribute to suboptimal economic decisions, including premature selling at unfavourable prices. Similarly, weak implementation support for *salam* contracts (0.1253) underscores a gap between the theoretical potential of Islamic social finance and its operational application. Despite the suitability of *salam* (forward sales) for agricultural financing, its limited implementation may reflect deficiencies in institutional support, financial literacy, and risk-management frameworks. Furthermore, lack of support from agricultural experts (0.1238) highlights deficits in agricultural extension services and technical knowledge transfer, which are important for strengthening smallholder capacity and facilitating technology adoption. Long distribution chains (0.1079) further contribute to market inefficiencies by increasing transaction costs and potentially reducing farm-gate margins, although their relative priority is lower than that of the constraints discussed above. Finally, water scarcity (0.0874) records the lowest limiting weight among the evaluated constraints, indicating that, within the ANP network, environmental pressures receive lower immediate priority than institutional, market, and technological factors.

At the cluster level, the support and expertise dimension achieves the highest overall systemic priority, with a combined limiting weight of 0.3862. This aggregate metric encompasses three interconnected constraints: inadequate technological support (0.1371), limited institutional support for *salam* contract implementation (0.1253), and insufficient expert support (0.1238). Although unproductive *waqf* land (0.1521) represents the single largest individual constraint, the cluster-level results indicate that capability- and institution-related

deficits exert the greatest aggregate influence within the agricultural *waqf* ecosystem. While the ANP limiting weights identify land underutilisation and intermediary reliance as the primary individual bottlenecks, stakeholders consistently prioritise support and expertise as a critical entry point for intervention. This suggests that technical capacity and institutional support may serve as strategic leverage points through which progress can be made in addressing broader structural constraints. From a dynamic capabilities' perspective, technical deficits and weak institutional support may limit smallholders' capacity to optimise resource allocation and adopt modern agricultural practices. Unlike land conversion and environmental pressures, which may require longer-term structural reforms and substantial investment, capability-related constraints may be addressed more readily through targeted training programmes, expanded extension services, and multi-institutional collaboration. Enhancing stakeholder capabilities and institutional support may therefore provide an operational pathway for improving market responsiveness, supporting more efficient land use, and narrowing the gap between policy design and field implementation.

5.2 RO2: Development of a *Waqf*-Based Agricultural Funding Framework

To address the second research objective (RO2), the study translates the ANP-derived priority findings from RO1 into a structured, *waqf*-based agricultural funding framework designed to address the identified systemic constraints.

The selection of a *waqf*-based funding framework is directly informed by the empirical ANP findings from RO1, which demonstrate that West Java's agricultural challenges stem from interconnected structural, market, institutional, and capability bottlenecks. Although these constraints manifest in diverse forms—such as unproductive land, reliance on informal intermediaries, and limited technological adoption—they share an important cross-cutting dimension: restricted access to appropriate, affordable, and sustainable non-debt financing mechanisms. From an analytical perspective, the ANP results indicate that the identified constraints operate as an interdependent network rather than as isolated problems, with financial and institutional limitations interacting with other structural conditions. For example, unproductive agricultural land may persist not only because of physical or environmental limitations but also because of insufficient capital for land development, soil rehabilitation, and modern infrastructure. Similarly, smallholders' dependence on middlemen may be reinforced by their reliance on informal credit for operational needs, which can restrict their ability to access formal off-takers and negotiate favourable prices. Likewise, low rates of technology adoption may be associated with capital barriers, including high upfront investment costs and limited access to affordable financing. These interrelationships suggest that financing represents an important cross-cutting constraint within the interconnected network of issues identified through the ANP analysis.

The choice of *waqf* as the primary source of capital is further justified by its alignment with *Maqasid al-Shariah*, particularly the preservation and productive utilisation of wealth (*hifz al-mal*). Unlike conventional debt-based financing, productive *waqf* can provide patient and socially oriented capital in which the endowed principal asset (*asl*) is preserved while its benefits (*manfa'ah*) are generated and potentially reinvested over time. This characteristic makes *waqf* particularly suitable for addressing longer-term structural challenges in agricultural productivity and rural development. Furthermore, integrating *waqf* with classical Islamic financial contracts such as *salam* and *muzara'ah* can link capital deployment to tangible real-sector production while incorporating principles of risk sharing and asset-based economic activity (Iqbal & Mirakhor, 2011). Beyond these general Islamic finance principles, the *salam* contract incorporated into the framework is grounded in AAOIFI *Shari'ah* Standard No. 10 on *Salam* and Parallel *Salam*, which addresses requirements relating to advance payment, precise commodity specification, including quantity and quality, and defined delivery terms. These principles inform the proposed upfront working-capital mechanism for smallholders. Meanwhile, the *muzara'ah* arrangement is based on classical *fiqh al-mu'amalat* principles whereby land and agricultural labour are contributed by separate parties, with the resulting crop yield distributed according to a pre-agreed sharing ratio. This arrangement is consistent with the relevant International Islamic Fiqh Academy rulings (IIFA-OIC Resolution No. 110 [4/12] on *Muzara'ah* and *Musaqah*) and classical treatments of agricultural partnership in *Al-Muwafaqat* (Al-Shatibi, 2004). Explicitly anchoring these contractual mechanisms in recognised *Shari'ah* standards and classical jurisprudential sources strengthens the normative foundation of the proposed framework and supports its alignment with established *fiqh al-mu'amalat* principles.

Operationalising *salam* contracts directly addresses the liquidity constraints identified in RO1 by providing

upfront working capital for agricultural inputs and potentially reducing smallholders' dependence on informal intermediary credit. Simultaneously, *muzara'ah* structures can facilitate the productive utilisation of underutilised *waqf* land by linking endowed agricultural assets with farming activities and shared production outcomes. This dual integration demonstrates that the proposed framework extends beyond simple fund allocation by linking specific *Shari'ah* contracts with the empirically prioritised needs identified through the ANP analysis.

Furthermore, the funding framework incorporates governance and capacity-building mechanisms, recognising that capital deployment alone may be insufficient to overcome institutional and capability deficits. The integration of specialised *nazhir* institutions, agricultural extension experts, technology providers, and market off-takers is intended to ensure that financial resources are supported by the technical, institutional, and market capabilities required for productive implementation. These non-financial components directly correspond to the support and expertise constraints highlighted in RO1. Consequently, agricultural *waqf* functions not only as a potential source of capital but also as an institutional coordinating mechanism that connects financial resources, technical expertise, and market access within an integrated and potentially more resilient agricultural ecosystem.

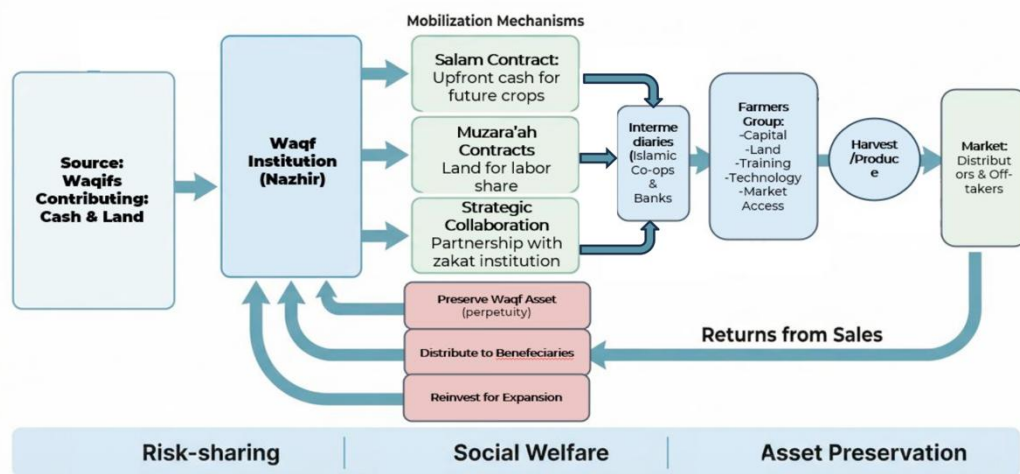


Figure 8. Funding Framework for Agricultural Development (developed by authors)

According to Figure 8, the proposed framework begins with the mobilisation of *waqf* resources, comprising both cash *waqf* capital and land *waqf* contributions from donors (*waqifs*). These resources are administered by a designated *waqf* institution (*nazhir*), which assumes a central coordinating role in ensuring that endowed assets are deployed productively. Consistent with the priority constraints identified in RO1, the *nazhir* is conceived not merely as a passive fund manager but as an active institutional coordinator linking financial and land resources with local smallholder needs, particularly those associated with unproductive land and financial exclusion.

To operationalise this funding architecture, the framework incorporates *salam* contracts to provide upfront working capital to smallholders prior to the harvest period. This mechanism is designed to address liquidity constraints and reduce farmers' dependence on informal intermediaries for operational credit. In parallel, *muzara'ah* arrangements facilitate the productive cultivation of *waqf* land through pre-agreed crop-sharing structures between the *nazhir* and smallholders, thereby directly addressing the issue of unproductive agricultural assets identified in RO1. Furthermore, the framework integrates strategic collaboration with *zakat* institutions, strengthening institutional coordination within the broader Islamic social finance ecosystem and potentially expanding access to complementary social support. The operationalisation process is facilitated by key intermediary institutions, including Islamic microfinance institutions and cooperatives, which serve as operational bridges between *nazhir* organisations and farmer groups. These intermediaries can provide financial

services alongside technical training, technological support, and market linkages, thereby responding to the support and expertise gaps highlighted in RO1. Smallholders, organised into agricultural groups, receive integrated support encompassing access to capital, productive agricultural land, technology, expert extension services, and market connections, thereby strengthening their production capacity and operational efficiency. The ultimate output of this integrated process is agricultural production linked to commercial off-takers and institutional distributors, with the aim of improving market absorption and reducing excessive dependence on informal intermediaries. Importantly, the framework incorporates a circular return mechanism whereby operational surpluses generated from agricultural activities are allocated across three primary components: first, the maintenance and preservation of endowed *waqf* assets to safeguard the perpetual corpus (*asl*); second, the distribution of benefits to designated beneficiaries (*mawquf 'alayh*); and third, reinvestment to expand agricultural activities and strengthen technological capabilities. This circular mechanism is intended to support the simultaneous preservation of *waqf* assets, generation of social benefits, and continued productive reinvestment.

Overall, the proposed framework embodies a risk-sharing, socially oriented, and sustainability-driven approach anchored in *Maqasid al-Shariah*, particularly the preservation of wealth (*hifz al-mal*) and the enhancement of public welfare (*maslahah*). By integrating capital mobilisation, institutional coordination, technical support, off-taker linkages, and productive land management, the framework responds to the interconnected constraints identified in RO1 through an integrated ecosystem approach. Consequently, the *waqf*-based funding framework provides a structured and empirically grounded model for supporting more inclusive, efficient, and sustainable agricultural development in West Java, while offering a basis for potential replication and adaptation across other agricultural regions of Indonesia.

5.3 RO3: Formulating Strategic Recommendations for Scaling and Replicating the Agricultural Waqf Model Across Indonesia

To operationalise the third research objective (RO3), this study employs the Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) matrices, following a quantitative strategic management approach (David, 2011). While the Analytic Network Process (ANP) provides a robust multi-criteria framework for identifying and prioritising key systemic constraints and solution nodes, it does not directly formulate strategic alternatives. Instead, ANP functions primarily as a diagnostic tool that captures relative priority weights as well as network feedback and interdependencies among variables within the system.

To translate these prioritised nodes into actionable strategies, the study integrates the ANP diagnostic results into a strategic evaluation framework operationalised through the IFAS and EFAS matrices. This hybrid ANP–SWOT approach reduces the subjective bias commonly associated with conventional SWOT analysis by anchoring strategy formulation in empirically derived priorities. Specifically, the factors included in each matrix are systematically identified from the highest-ranked factors based on their ANP limiting weights, while their relative IFAS and EFAS weights are established through a structured expert validation process.

Within this matrix framework, internal factors (strengths and weaknesses) are mapped directly from the most influential nodes identified in the ANP supermatrix. Strengths are derived from high-priority solution nodes, reflecting the operational capabilities of the ecosystem. For instance, institutional synergy between *waqf* and *zakat* entities (limiting weight = 0.1239) and the implementation of *salam–muzara'ah* contract farming (limiting weight = 0.1156) represent core structural and financial strengths of the model. Conversely, weaknesses stem from the most critical constraint nodes, including unproductive *waqf* lands (0.1521) and reliance on informal intermediaries (0.1405), which constitute the primary internal bottlenecks restricting value distribution and smallholder welfare. External factors (opportunities and threats) synthesise macro-environmental conditions identified in the literature with broader systemic insights derived from the ANP network. Opportunities encompass supportive institutional policy frameworks and the increasing adoption of *Shariah*-compliant financial instruments, both of which foster a conducive ecosystem for scaling agricultural *waqf* initiatives. In contrast, threats represent exogenous risks, such as climate variability, extreme weather events, and demographic shifts—particularly youth out-migration from agriculture—that jeopardize long-term sector sustainability.

To ensure analytical consistency, the factors included in the IFAS and EFAS matrices are assigned normalised weights summing to 1.00 for each matrix. Performance ratings, ranging from 1 (poor response) to

4 (superior response), evaluate the current responsiveness of the system to each factor. Through this procedure, the hybrid ANP–SWOT framework transforms multi-criteria priorities into structured strategic options, enabling a systematic evaluation of internal capabilities and external conditions. The integration of ANP and SWOT does not represent methodological redundancy, but rather a complementary analytical progression wherein ANP provides empirical diagnosis and SWOT facilitates strategy formulation. Crucially, this hybrid approach bridges the gap between diagnostic evaluation and strategic action. By anchoring recommendations in empirical evidence, the resulting strategies are specifically designed to address binding constraints while leveraging promising opportunities, thereby providing a robust, data-driven basis for scaling agricultural *waqf* initiatives across different regional contexts in Indonesia.

To clarify the conversion mechanism between the ANP supermatrix and the IFAS/EFAS matrices, the ANP limiting weights are not transferred directly as matrix weights. Instead, the ANP results are used to identify and prioritise the most critical factors for inclusion. A follow-up expert consultation was then conducted to evaluate the strategic importance of each selected factor within its respective SWOT category. During this stage, experts assigned a strategic significance rating ranging from 1 (low significance) to 3 (high significance). Following standard strategic management procedures (David, 2011), the final weight for each factor was derived by dividing its individual significance score by the total cumulative significance score within the respective category. For example, within the Strengths category (total significance score = 8), institutional synergy between *zakat* and *waqf* entities (ANP limiting weight = 0.1239; significance score = 3) received a normalised weight of $\frac{3}{8} = 0.38$. Conversely, the implementation of *salam–muzara'ah* contracts (ANP limiting weight = 0.1156; significance score = 1) received a weight of $\frac{1}{8} = 0.13$. Consequently, ANP limiting weights are used to identify and prioritise the factors included in the strategic matrices, whereas the final IFAS and EFAS weights are derived from the normalised significance scores obtained through expert strategic validation.

Table 3. Internal Factor Analysis Summary (IFAS)

STRENGTHS	sig. level	Weight	Rating	Score
Abundant natural resource potential.	3	0.38	4	1.50
The implementation of <i>salam</i> and <i>muzaraah</i> contract systems.	1	0.13	4	0.50
The synergy between <i>zakat</i> and <i>waqf</i> institutions in agriculture.	3	0.38	3	1.1313
Existence of agricultural labour.	1	0.13	3	0.38
TOTAL	8	1.0		3.50
WEAKNESS	sig. level	Weight	Rating	Score
Lack of technological support.	3	0.30	4	1.2
Lack of understanding of <i>salam</i> and <i>muzaraah</i> contracts	3	0.3	3	0.9
Low access to capital and investment.	2	0.20	4	0.8
Lack of synergy between Islamic financial institutions and farmers.	2	0.20	2	0.4
TOTAL	10	1.0		3.3
Strengths - Weaknesses				0.20

Table 4. External Factor Analysis Summary (EFAS)

OPPORTUNITIES	sig. level	Weight	Rating	Score
Agricultural technology development	3	0.43	4	1.71
Government support in the agricultural sector.	2	0.29	4	1.14

Growing interest in <i>sharia</i> transactions.	2	0.29	3	0.86
TOTAL	7	1		3.71
THREATS	sig. level	Weight	Rating	Score
Climate change and natural disasters.	3	0.3	4	1.2
Lack of regulations that support <i>salam</i> and <i>muzaraah</i> contracts.	2	0.2	3	0.6
Competition with imported products.	3	0.3	4	1.2
Lack of interest from the younger generation in agriculture.	2	0.2	4	0.8
TOTAL	10	1		3.8
Opportunities - Threats				-0.09

The IFAS and EFAS factors were identified and validated through in-depth interviews with key stakeholders, including academics, policymakers, and practitioners involved in the agricultural and Islamic finance sectors. These qualitative insights were subsequently quantified using the hybrid ANP–SWOT approach, ensuring that both internal and external factors reflect real-world operational conditions rather than purely theoretical assumptions. The IFAS results demonstrate that the system's internal strengths (total score = 3.50) slightly outweigh its weaknesses (3.30), indicating a relatively solid internal foundation. These strengths are primarily derived from abundant natural resource potential, strong institutional synergy between *waqf* and *zakat* institutions, and the availability of *Shariah*-compliant contractual mechanisms such as *salam* and *muzara'ah*. However, the EFAS results reveal that external threats (3.80) marginally exceed opportunities (3.71), indicating that the macro-environment is characterised by greater risk exposure than growth potential.

Based on the IFAS and EFAS matrix analysis, the agricultural *waqf* system in West Java is positioned in the Strength–Threat (ST) quadrant, as indicated by a positive internal differential ($S - W = +0.20$) and a slightly negative external differential ($O - T = -0.09$). This strategic positioning suggests that, while the system possesses relatively strong internal capabilities, it operates within a challenging and increasingly volatile external environment. Accordingly, the most appropriate strategic orientation is an ST strategy, which emphasises leveraging internal capabilities to mitigate external threats.

Given this strategic positioning, the core strategic direction should focus on strengthening systemic resilience through *waqf*-based institutional and contractual mechanisms. In particular, *salam* (forward purchase) and *muzara'ah* (sharecropping) contracts can function as risk-sharing instruments to stabilise smallholder incomes and reduce vulnerability to price volatility and yield uncertainty. Simultaneously, institutional synergy between *waqf* and *zakat* organisations can be strengthened to support local production inputs and improve resource allocation efficiency. These measures can enhance the ecosystem's capacity to absorb external shocks, including climate variability, market competition, and regulatory constraints.

More specifically, the proposed ST strategy addresses several key external threats identified in the EFAS evaluation. Climate change and natural disasters, which represent significant external threats, can be addressed through risk-sharing contractual structures and climate-adaptive farming practices. Similarly, competition from imported agricultural commodities can be mitigated by strengthening domestic production capacity and enhancing supply-chain efficiency through multi-institutional collaboration. Regulatory gaps surrounding the implementation of *salam* and *muzara'ah* can be partially addressed by establishing standardised institutional frameworks and operational guidelines. Furthermore, declining interest in agriculture among rural youth can be addressed by integrating modern agricultural technologies and digital platforms into the *waqf*-based ecosystem.

Although market opportunities remain relatively high (3.71), the presence of stronger external threats (3.80) indicates that an aggressive, growth-oriented (SO) strategy may not be appropriate as the primary strategic posture. Instead, expansion initiatives should be pursued selectively, particularly by leveraging technological adoption and growing interest in *Shariah*-compliant financial instruments. Concurrently, complementary Weakness–Opportunity (WO) strategies are necessary to address internal constraints, such as limited technical capabilities and low financial literacy regarding Islamic contracts, through targeted extension and capacity-

building programmes. Finally, defensive Weakness–Threat (WT) measures should be maintained to reinforce institutional governance and minimise operational risk exposure under adverse macro-environmental conditions.

In conclusion, the IFAS–EFAS analysis establishes that the agricultural *waqf* system in West Java occupies the Strength–Threat (ST) quadrant, demonstrating that, while the ecosystem possesses strong internal capabilities, it operates within a challenging external environment. Consequently, the primary strategic orientation should remain resilience-focused, deploying internal strengths to mitigate external risks rather than pursuing unconstrained expansion. Optimising *waqf*-based institutional and contractual mechanisms—particularly through *salam–muzara'ah* integration and *waqf–zakat* collaboration—can enhance ecosystem stability and adaptive capacity across climate, market, and regulatory domains.

Ultimately, this resilience-oriented ST strategy, supported by selective growth (SO), targeted capacity enhancement (WO), and defensive governance (WT) measures, provides a balanced and sustainable development pathway. By anchoring strategic formulation in empirical ANP weights and expert validation, the proposed model offers a context-sensitive and analytically grounded basis for strategic development. This integrated approach positions *waqf* not merely as a funding mechanism but also as a stabilising institutional framework for long-term agricultural transformation across Indonesia.

5.4 Implementation Challenges and Governance Considerations

Translating the proposed ANP–SWOT strategic framework into practice requires addressing several implementation challenges that extend beyond the immediate scope of the proposed model.

One of the most significant barriers concerns the legal status of *waqf* land. Many agricultural *waqf* assets in Indonesia—including those outside the pilot sites managed by Dompot Dhuafa in Subang—remain legally uncertified. This lack of formal registration creates legal uncertainty, heightens the risk of land disputes, and restricts the capacity of *waqf* assets to function as productive resources within formal financing arrangements. In addition, although this study proposes the structured integration of *salam* and *muzara'ah* contracts, specific *fatwa*-level guidance addressing their combined operational application within *waqf*-based agricultural financing remains limited. The absence of explicit regulatory guidance creates operational uncertainty for *waqf* institutions and financial intermediaries seeking to scale the proposed model nationally. Institutional governance represents a second critical challenge. Although Law No. 41 of 2004 establishes the regulatory framework for the Indonesian Waqf Board (BWI) and provides for its role in the governance of *waqf* assets, the technical competence and managerial capacity of *nazhir* institutions vary considerably across regions. Likewise, standardised governance practices—including transparent financial reporting, independent auditing, and formal safeguards against conflicts of interest—are inconsistently implemented. Consequently, expanding the proposed framework beyond West Java requires more than simply replicating its financing mechanisms; it necessitates the establishment of institutional governance standards and the enhancement of *nazhir* professional capacity to ensure that productive *waqf* assets are managed transparently, efficiently, and accountably.

Another fundamental consideration concerns balancing the preservation of *waqf* assets with meeting smallholders' immediate working-capital requirements. The core principle of *waqf* governance requires preservation of the corpus (*asl*) of the endowed asset, whereas *salam* financing requires upfront liquidity to be provided to farmers prior to harvest. Reconciling these objectives requires robust financing structures that utilise operational surpluses generated by productive assets or systematically combine *waqf* resources with complementary Islamic social finance instruments, such as *zakat* and *sadaqah*, to absorb yield and market risks without eroding the underlying endowment corpus.

6. Limitations of the Study

This study is subject to several methodological and empirical limitations. First, the expert panel comprised six informants (two academics, two practitioners, and two policymakers), which represents a relatively small sample for both the ANP pairwise comparisons and the IFAS/EFAS factor weighting and rating processes. Although this panel size aligns with standard ANP methodology—where the depth, domain relevance, and diversity of expert judgement take precedence over statistical sample size (Saaty, 2008)—the findings should be interpreted as reflecting the informed judgements of this specific panel rather than a statistically generalisable view of the broader stakeholder population. Second, the same six experts provided both the

qualitative interview data (Stage 1) and the quantitative pairwise comparison evaluations (Stage 2). While this dual participation strengthens internal consistency across the qualitative and quantitative analytical stages, it also means that the two data sources are not fully independent, thereby introducing a potential risk of common-source bias.

Third, the expert panel did not include smallholder farmers, who constitute the primary intended beneficiaries of the proposed *waqf*-based funding framework. While the panel's institutional and technical expertise is well suited to identifying and prioritising macro-structural constraints, farmers' direct perceptions regarding the operational practicality, socio-cultural acceptability, and alignment of the framework with field realities were not empirically captured. Consequently, the on-the-ground feasibility of the model—particularly smallholders' willingness to adopt *salam* and *muzara'ah* contractual arrangements—requires further empirical validation.

To build upon this study, future research should extend the proposed analytical framework by engaging a larger and more geographically diverse expert panel across different provinces in Indonesia. Furthermore, subsequent empirical studies should incorporate direct farmer-level assessments to evaluate contractual acceptability and triangulate the findings with an independent respondent group to assess the robustness of the priority weights reported in this study.

7. Conclusion and Recommendations

This study demonstrates that the socio-economic and financing challenges facing West Java's agricultural sector are systemic and highly interdependent, spanning structural, market, and capability dimensions. The ANP empirical results identify unproductive *waqf* land, reliance on informal intermediaries, and limited technological support as the primary individual constraints. These findings indicate that while land underutilisation and market distortions represent the most binding structural bottlenecks, capability deficits function as enabling constraints that impede productivity and technology adoption. Crucially, the network analysis reveals that these barriers operate interdependently, underscoring that effective intervention requires a unified, system-level strategy rather than isolated, piecemeal measures. Building on these empirical priorities, the study develops a structured *waqf*-based agricultural funding framework that operationalises *salam* (forward purchase) and *muzara'ah* (sharecropping) contracts as core mechanisms. The model positions *waqf* not merely as a passive source of non-debt capital but as an active institutional platform that coordinates land, capital, technical expertise, and market access. By providing upfront working capital through *salam*, enabling productive land utilisation through *muzara'ah*, and enhancing institutional governance through *nazhir* organisations and financial intermediaries, the framework directly addresses the priority constraints identified under RO1. Consequently, the proposed model offers an empirically grounded and potentially scalable approach to improving productivity, reducing smallholders' dependence on intermediary credit, and enhancing overall value-chain efficiency.

To support broader implementation across Indonesia, the study formulates strategic recommendations using a hybrid ANP–SWOT evaluation. The IFAS–EFAS results position the agricultural *waqf* ecosystem in the Strength–Threat (ST) quadrant, indicating that strategic priorities should focus on deploying internal institutional strengths to mitigate external risks. Accordingly, the core strategic orientation emphasises systemic resilience by optimising *waqf*-based contractual mechanisms and strengthening *waqf*–*zakat* synergies, complemented by selective growth (SO), targeted capacity enhancement (WO), and defensive governance (WT) measures. By anchoring these recommendations in empirical ANP weights and expert validation, the study provides a robust analytical foundation for policy formulation. However, because the empirical scope is centred on West Java and based on a focused expert panel, national-level scalability should be treated as a strategic proposition requiring further empirical validation across diverse regional and institutional contexts in Indonesia. Finally, based on the conclusions outlined above, the strategic recommendations are presented as follows:

Table 5. Strategic Recommendations

Dimension	Strategic Focus	Key Actions	Link to ROI Findings	Expected Impact	Implementation Risk / Barrier
Policy	Regulatory support for waqf agriculture	Develop national guidelines for productive waqf in agriculture; integrate waqf into agricultural and rural development policies	Addresses institutional gaps and weak coordination	Improved policy alignment and nationwide scalability	Slow inter-ministerial coordination; absence of DSN-MUI fatwa specific to waqf-based <i>salam-muzara'ah</i>
Institution	Strengthening <i>nazhir</i> capacity	Professionalise waqf management; establish partnerships with Islamic financial institutions, cooperatives, and zakat bodies	Responds to lack of support and expertise	Enhanced governance and implementation effectiveness	Uneven <i>nazhir</i> capacity across regions; limited independent oversight
Finance	Expansion of waqf-based funding mechanisms	Scale up cash waqf mobilisation; implement <i>salam</i> and <i>muzara'ah</i> contracts; create blended finance models	Targets capital constraints and middlemen dependency	Increased access to funding and reduced financial vulnerability	Tension between waqf principal preservation and <i>salam</i> 's upfront capital needs
Technology	Enhancing agricultural capabilities	Provide training, digital agriculture tools, and extension services; integrate smart farming technologies	Addresses lack of technological support	Higher productivity and improved efficiency	High upfront training cost; limited digital infrastructure in rural areas
Market	Market integration and access	Develop direct-to-market platforms; strengthen farmer cooperatives; connect farmers with off-takers	Reduces reliance on middlemen and market uncertainty	Fairer pricing and improved market stability	Resistance from existing middlemen networks; cooperative formation takes time

8. Theoretical, Practical, and Policy Implications

This study contributes across three key domains. Theoretically, it advances the Islamic social finance literature by demonstrating an integrative framework that combines empirically derived ANP prioritisation with SWOT-based strategic formulation through IFAS–EFAS matrices. This extends prior conceptual research on *salam-muzara'ah*–

linked *waqf* models (e.g., Majid, 2021) into an empirically weighted decision framework. Methodologically, it addresses theoretical fragmentation by integrating *Maqasid al-Shariah*, Agribusiness Systems Theory, Imperfect Market Theory, and Behavioural Economics within a single analytical model of agricultural *waqf*. Practically, the findings offer actionable operational guidance for *waqf* institutions (*nazhir*), such as Dompot Dhuafa and the Indonesian Waqf Board (BWI). Specifically, the findings provide a structured basis for organising *salam*-based upfront liquidity disbursements and *muzara'ah*-based land utilisation while prioritising capacity-building investments in areas with potentially greater structural impact, including digital technology adoption, contract literacy, and agricultural extension services.

At the policy level, the results outline strategic priorities for national and regional stakeholders, including bodies such as Bappeda. Key recommendations include integrating productive *waqf* into regional development plans, addressing regulatory ambiguities surrounding the application of *salam–muzara'ah* arrangements through appropriate DSN–MUI *fatwa* guidance, and formalising multi-institutional collaboration across *waqf*, *zakat*, and Islamic financial institutions. Building on these contributions and acknowledging the limitations outlined in Section 6, future research should empirically validate the operational feasibility and socio-cultural acceptability of the framework through direct field-based assessments with smallholder farmer beneficiaries. Further research should also examine the model's applicability and scalability across diverse agricultural regions within Indonesia, as well as in other Islamic finance jurisdictions, such as Malaysia. In addition, longitudinal assessments should be conducted to evaluate long-term socio-economic outcomes once the framework is operationalised.

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Maqasid Al-Shariah-Based Measurement Constructs In The Halal Economy: A Bibliometric Analysis Of Key Themes

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Abstract

Maqasid al-Shariah provides a foundational ethical and welfare-oriented framework for the halal economy. However, its application remains largely theoretical, with limited translation into concrete operational constructs capable of guiding business operations, policy formulation, and consumer protection. While existing literature emphasises the conceptual relevance of *Maqasid al-Shariah*, empirical measurement instruments for evaluating industry performance against Islamic objectives remain underdeveloped. This study addresses this critical gap by proposing a *Maqasid al-Shariah*-based conceptual framework to inform future benchmarking instruments and governance standards across the halal economy. Employing a mixed-methods bibliometric design, the study systematically analyses 130 peer-reviewed documents published between 2009 and 2024 and indexed in the Scopus database. Quantitative and qualitative analyses were conducted using VOSviewer and complementary analytical software to map research trajectories, keyword co-occurrences, and thematic clusters. The bibliometric mapping reveals a fragmented literature landscape characterised by single-sector evaluations and a lack of unified measurement frameworks. To address this gap, the study proposes an integrated conceptual framework establishing operational constructs and indicators across key halal sectors, including halal food, Islamic finance, Muslim-friendly tourism, and pharmaceuticals, explicitly mapped to the five essential objectives (*daruriyyat*) of *Maqasid al-Shariah*. The proposed framework provides an analytical foundation for ethical benchmarking, *Shariah*-compliant performance evaluation, corporate governance, and consumer protection mechanisms. By operationalising theoretical *Maqasid* principles into measurable criteria, this study advances a value-driven and sustainable governance model for the global halal economy.

Keywords: *Maqasid Shariah, Measuring Instrument, Halal economy, Issues, Future Direction*

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1. Introduction

The global halal economy encompasses a broad spectrum of sectors engaged in the production, distribution, and consumption of *Shariah*-compliant goods and services, including food and beverages, logistics, Islamic finance, Muslim-friendly tourism, and pharmaceuticals (Mohd Fauzi et al., 2022). Driven by an expanding Muslim population and growing global demand for ethically produced goods among both Muslim and non-Muslim consumers, the sector has experienced rapid market expansion (Prayuda et al., 2023). This rapid growth across diverse supply chains highlights the need for a *Maqasid al-Shariah*-based evaluative framework capable

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of assessing commercial performance through both financial and ethical perspectives (Al-Ayubi, 2023; Rahman et al., 2017). Because *Shariah* principles govern both temporal socio-economic interactions and spiritual well-being, *Maqasid al-Shariah* (the higher objectives of Islamic law) has increasingly emerged as an important conceptual framework in contemporary economics. However, the operationalisation of *Maqasid al-Shariah* into empirical measurement constructs and validated performance models remain significantly underexplored (Abdullah & Azam, 2020).

Despite the theoretical prominence of *Maqasid al-Shariah* in articulating the protection of human welfare and societal well-being (*maslahah*), a substantial gap persists between normative theory and practical governance (Ashur, 2013; Zuhlilmi et al., 2023). Much of the existing literature focuses on qualitative descriptions of Islamic principles rather than developing standardised, empirically testable measurement tools. The economic significance of such tools is evident: for instance, the halal economies estimated 7.5 per cent contribution to Malaysia's Gross Domestic Product (GDP) underscores its importance and highlights the need for robust, *Maqasid*-grounded performance metrics (World Bank Group, 2022). Developing such evaluative instruments is important for strengthening institutional governance, consumer protection, ethical compliance, and long-term sustainability. Yet, systematic frameworks capable of measuring the extent to which commercial products, financial instruments, and operational processes align with *Maqasid al-Shariah* objectives remain sparse and fragmented across sectors.

To address this gap, this study presents a comprehensive bibliometric analysis of peer-reviewed literature to examine the evolution of *Maqasid al-Shariah*-based measurement constructs and map prospective research trajectories. By systematically evaluating the publication landscape from 2009 to 2024, the study identifies core intellectual themes, methodological approaches, and structural gaps in contemporary scholarship. The resulting insights inform the formulation of an integrated conceptual framework that translates abstract *Maqasid al-Shariah* principles into concrete, measurable indicators applicable across the primary sectors of the global halal economy.

2. Literature Review

Maqasid al-Shariah provides a foundational framework for ethical measurement across commercial production, financial transactions, and consumer behavior (Junus et al., 2024). The fundamental objectives (*essentialia* or *daruriyyat*) of *Maqasid al-Shariah* seek to safeguard five vital human interests: faith (*din*), life (*nafs*), intellect (*'aql*), lineage (*nasl*), and wealth (*mal*), offering a comprehensive basis for ethical governance and policy formulation in Islamic economics (Kholish et al., 2020). Scholars such as Chapra (2008), Asutay (2012), and Ahmed (2013) emphasize that *Maqasid al-Shariah* advances distributive justice, social equity, and public welfare (*maslahah*), providing an evaluative framework that extends beyond technical legal compliance and *halal-haram* dichotomies. While the global halal economy spans diverse sectors—including food, finance, tourism, logistics, pharmaceuticals, and cosmetics—research on holistic, *Shariah*-aligned performance measurement instruments remains limited, with existing evaluative models focusing predominantly on product-level ingredient verification rather than broader socio-ethical impacts. Current regulatory and certification regimes, such as those governed by JAKIM in Malaysia and BPJPH in Indonesia, focus primarily on product-specific technical standards, emphasizing the exclusion of non-halal (*haram*) substances. However, these frameworks systematically omit broader dimensions, including environmental sustainability, labor rights, and socio-economic justice, which are central to the wider objectives of *Maqasid al-Shariah*. Scholars including Warde (2010), Abdullah and Yusoff (2014), and Bouzenita and Al-Salem (2017) criticize this narrow technical scope and call for integrated measurement tools that reflect the holistic ethical and socio-economic objectives of Islamic jurisprudence. Furthermore, Laluddin et al. (2019) and Mohd Fauzi et al. (2022) argue that addressing structural challenges in halal governance, such as ambiguous compliance guidelines, high certification costs, and institutional fragmentation, is essential for sustaining regional halal market leadership. In evaluating existing assessment tools, international standards such as ISO 22000, alongside national halal standards, play important roles in quality assurance but remain largely product-centric. As Alserhan (2016) highlights, such technical instruments fall short of addressing broader corporate social responsibility and long-term sustainability. Because these conventional frameworks lack explicit alignment with *Maqasid al-Shariah*, they possess limited capacity to evaluate how commercial operations affect human dignity, wealth distribution,

and environmental stewardship (Kamil et al., 2025).

To address these evaluative gaps, several scholars have proposed *Maqasid*-oriented alternatives. Siddiqi (2009) advocates embedding explicit social and ethical metrics within halal certification schemes, while Ismail and Alhabshi (2018) and Busari et al. (2024) propose evaluating Islamic financial institutions based on their contributions to equitable wealth preservation, social welfare, and transparent governance. Similarly, Kahf (2004) outlines *Maqasid*-aligned indicators across healthcare, food production, and finance, focusing specifically on fair labor practices, public health impacts, and ethical supply chain management. Despite advancements in halal certification, existing instruments remain constrained by their relatively narrow regulatory focus. Transitioning toward multidimensional *Maqasid al-Shariah*-based measurement frameworks is therefore vital for capturing the broader socio-ethical mandate of the global halal economy. Operationalizing these higher objectives into measurable performance constructs will align industry practices with Islamic moral economy principles, fostering a sustainable, value-driven market model.

3. Conceptual Framework

Conceptual Structure of the Halal Economy: Exploring Keywords and Terms in the Dataset

This section maps the conceptual structure of the field by analysing themes and trends using the Scopus dataset and VOSviewer. It visualises keywords, clusters, and co-authorship patterns to assess the current state of halal economy research, identify gaps, and suggest emerging directions for future studies. Keywords and Terms in the Dataset. The first step involves generating keywords from the dataset using VOSviewer (Öztürk et al., 2024). The “Create a map based on text data” option is selected in the software interface to generate a term co-occurrence map (Passas, 2024). The subsequent steps are as follows: (a) An RIS-format file containing the dataset is imported into the software, and the Title and Abstract fields are selected to indicate where terms and keywords are to be extracted from the dataset. “Full counting” is selected to capture term occurrences, and a threshold of 5 is set, meaning that a term must occur at least five times to be included in the analysis. Any term occurring fewer than five times in the dataset is excluded from the generated list of terms (Bukar et al., 2023). (b) A total of 324 words meet the threshold out of 3,756 words identified in the titles and abstracts of the documents in the dataset. For each of the 324 terms, the software calculates a relevance score to identify the most relevant terms. The default setting in VOSviewer is to select the 60 per cent most relevant terms (Bukar et al., 2023).

Based on the input dataset for this study, 194 terms were initially selected. However, the software provides an option to review the terms and remove those considered less relevant for reasons related to the research objectives or study design. This process is intended “to ensure insightful and accurate analysis can be performed on the text of interest” by removing, for example, generic or irrelevant terms (Bukar et al., 2023). Accordingly, 119 keywords were retained for the analysis, while 75 were systematically removed using a four-point, replicable exclusion protocol: (1) filtering out generic academic filler terms; (2) excluding geographical names; (3) removing general methodological terminology; and (4) consolidating plural and synonymous variants using a VOSviewer thesaurus file.

Table 1: Top High-Frequency Terms Extracted from VOSviewer Bibliometric Mapping

Term	Occurrences	Relevance Score
Consumer	94	0.1817
Opportunity	63	0.5591
Challenge	54	0.7155
Attitude	44	0.5437
Marketing	32	0.4732
Framework	31	0.5489
Performance	27	1.1425
Knowledge	26	0.3481
Muslim Country	25	0.3637
Export Performance	9	2.6374
Customer Satisfaction	6	2.4686
Muslim Traveller	7	2.2641

Corporate Halal Reputation Index	5	2.2195
Corporate Halal Reputation	6	2.1085
Muslim Minority Country	8	1.9097

Network and Overlay Visualisation Maps: Presentation and Analysis

Based on the generated terms, a set of visualisation maps (see Figure 1) was created using VOSviewer version 1.6.19 to capture the occurrence and co-occurrence of the 119 terms. The resulting map contains 1,417 links, with a total link strength of 13,157. This section thematically explores the dataset using these maps to provide deeper insights into the research landscape and identify potential directions for future research.

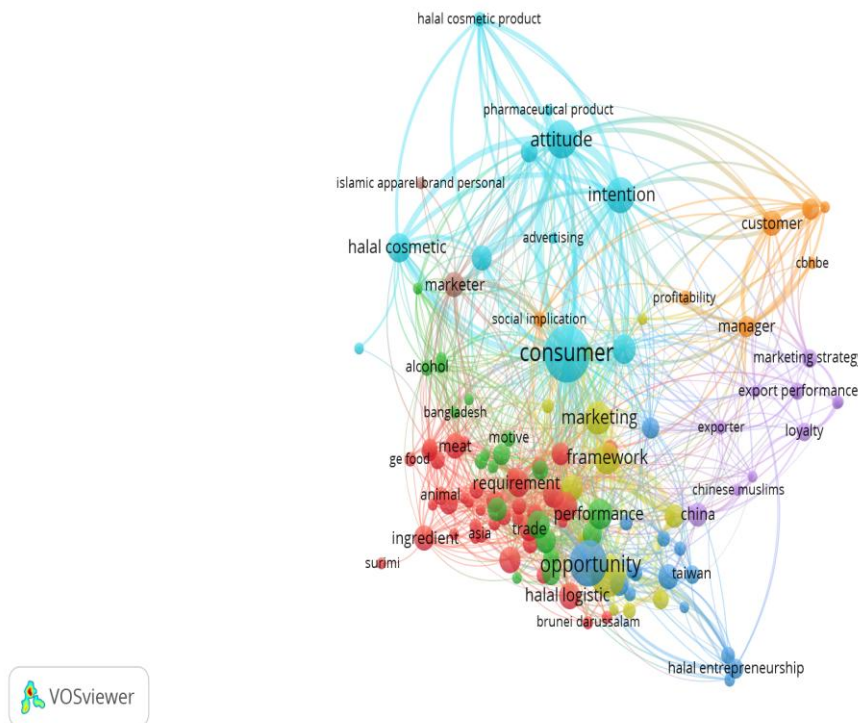


Figure 1: Network Visualization

The map produces eight clusters, where a cluster refers to a group of terms that are classified together and represented by different colours in the text network (Bukar et al., 2023). Figure 1 illustrates distinct issues related to the halal economy through colour-coded clusters. In VOSviewer, each non-overlapping cluster comprises closely related terms (nodes) assigned by the software. The number of clusters depends on the resolution setting; a higher resolution value generally results in a greater number of clusters. These clusters form the basis for analysing and discussing the key themes and issues identified in the field (Guest & McLellan, 2003). See Table 2.

CLUSTERS	KEYWORDS/TERMS (Representative)	THEMES (Concise)
CLUSTER ONE (40 ITEMS)	Animal, Asia, Blockchain, Certification, Halal Integrity, Logistics, Supply Chain, Hygiene, Islamic Law, Regulation, Safety, Technology, Trade	Global Halal Ecosystem, Trade, Standards, Food Safety, Emerging Technologies, Regional Aspects

CLUSTER TWO (20 ITEMS)	Animal Fat, Business Performance, Export, Halal Certificate, Food Industry, Jakim, Manufacturer, Muslim Lifestyle, Shariah	Halal Food Industry and Business Business Performance, Manufacturing, Consumer Trends, Certification
CLUSTER THREE (15 ITEMS)	Entrepreneur, Halal Entrepreneurship, Halal Tourism, Hospitality, Muslim Minority, Traveller, Opportunity, Sustainable Economy	Halal Tourism and Entrepreneurship Entrepreneurial Opportunities, Innovation, Challenges in Muslim Minority Countries
CLUSTER FOUR (13 ITEMS)	Challenge, Corporate Halal Reputation, Certification Body, Halal Economy, Marketing, Metaverse, Stakeholder	Halal Industry Development and Challenges Industry Challenges, Stakeholder Roles, Reputation, Marketing, Virtual Interaction
CLUSTER FIVE (11 ITEMS)	China, Chinese Muslims, Customer Satisfaction, Export, Exporter, Halal Brand, Loyalty, Marketing Strategy, Policy Maker	Halal Market and Consumer Behavior, Consumer Preferences, Brand Development, Policymakers' Role, Chinese Muslim Market
CLUSTER SIX (11 ITEMS)	Advertising, Attitude, Consumer, Halal Cosmetic, Food Product, Intention, Knowledge, Personal Care, Pharmaceutical, Religiosity	Halal Consumer and Product Perception Attitudes, Intentions, Marketing, and Religiosity Influence on Consumption
CLUSTER SEVEN (7 ITEMS)	Customer, Family Takaful, Manager, Pakistan, Profitability, Social Implications	Halal Finance and Social Impact Islamic Banking, Social Impact, Profitability, and Sustainability
CLUSTER EIGHT (2 ITEMS)	Islamic Apparel Brand Personality Model, Marketer	Halal Marketing and Branding Branding Strategies, Brand Development, Islamic Apparel Branding

Table 2: Clusters Generated from Terms in VOSviewer and Their Reformulation into Themes

Having identified the conceptual and thematic issues related to the halal economy through the network visualisation, the next step is to examine trends in the evolution of concepts and themes using the VOSviewer overlay visualisation as the point of departure. These trends are subsequently discussed to highlight key insights emerging from the data.

Trends: Current Research Status and Emerging Issues

The overlay visualisation map, another feature of VOSviewer, is used to capture and visually represent key dimensions of the dataset in addition to the network visualisation. The two visualisations are similar in structure, but the items are coloured differently according to the selected overlay attribute ([van Eck & Waltman, 2020](#)). The overlay visualisation enables researchers to identify trends, developments, and relationships among issues and themes within a research field over time. It can also facilitate the identification of recent research trends by allowing items to be classified according to a timescale, which serves as a key for interpreting the map ([Shvindina, 2019](#)) (see the bottom-right corner of Figure 2).

Figure 2 illustrates the timeline of how selected concepts within halal economy research have evolved based on the publication years of the documents. The items are coloured according to the years of publication, representing the average publication year associated with each item or cluster. In VOSviewer, items can also be coloured according to their scores, whereby the colour of an item is determined by its corresponding score. By default, the colour scale ranges from blue, representing the lowest scores, through green to yellow, representing the highest scores ([van Eck & Waltman, 2020](#)). As shown in Figure 2, terms that appeared more recently, with an average publication year of 2024, are represented in yellow. The colour bar in the bottom-right corner of the visualisation (see Figure 2) indicates the relationship between the scores or publication years and the corresponding colours, thereby providing a visual guide for interpreting the temporal trends in the research field.

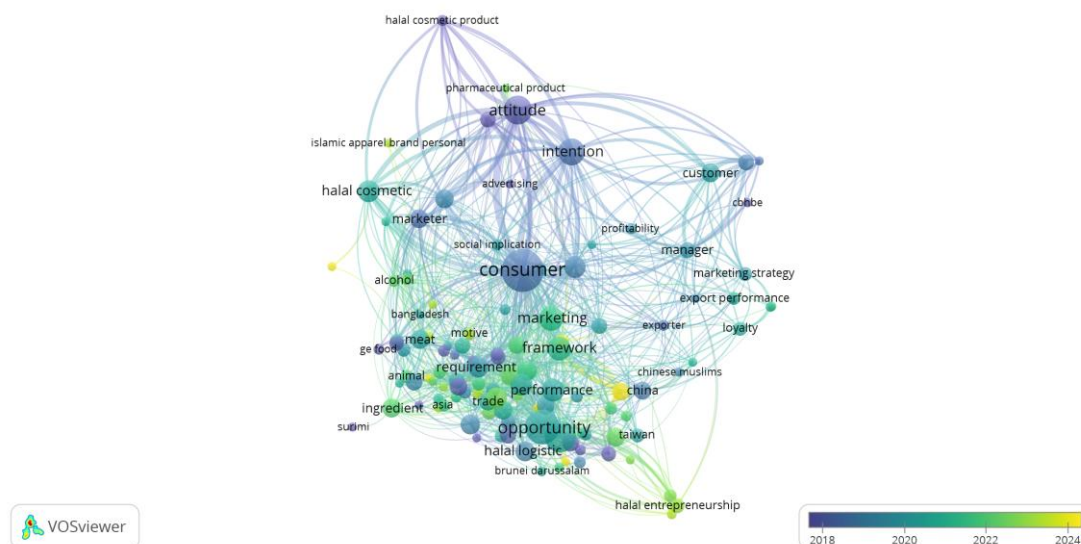


Figure 2: Overlay Visualization

The colour of each cluster, consisting of interconnected nodes, is represented on the colour bar to indicate the range and temporal trends based on the average publication year of the documents in which the terms occur (see Figure 2). In some cases, labels may not be displayed in the visualisation to avoid overlapping labels (van Eck & Waltman, 2020). The blue cluster represents themes that received research attention from around 2018 but have become less prominent in more recent publications, whereas the green cluster represents themes that have received increasing research attention. The yellow cluster represents the most recent themes and has attracted the highest level of research attention in the dataset. The areas or issues represented by each colour-coded cluster are presented in Table 3.

Table 3: The keywords and their Research focus trends

YELLOW	Metaverse, Personal care industry, technological acceptance model (TAM), Sustainable economy, motive, Halal entrepreneurship, blockchain, etc
GREEN	Customer satisfaction, Export performance, Loyalty, Framework, Marketing, Spain, Compliance, Halal sector, integrity, Meat, Animal, Asia, Perception, Islamic apparel brand, pharmaceutical product, Alcohol, Halal cosmetic, Islamic law, Middle East, Opportunity, Challenges, Ingredient, Certification process, Hospitality, Muslim, minority country, Muslim traveller, etc.
BLUE	Religiosity, GE food, Halal status, Halal food industry, Jakim, Cross contamination, Halal supply chain, Consumer, knowledge, Attitude, etc.

Next section explores the foregoing data presented, discussing the salient detailed therein

4. Research Methodology

4.1 Research Method and Data Analysis Process

The study employs descriptive and bibliometric analysis using data retrieved from bibliometric databases and presented through tables, graphs, and visualisations. By combining quantitative and qualitative analytical approaches, the study maps existing knowledge and identifies emerging research issues (Shvindina, 2019, p. 1), thereby providing insights into potential directions for future research. The bibliometric analysis captures the intellectual and conceptual landscape of the halal economy literature (Öztürk et al., 2024) using documents

retrieved from the Scopus database. The findings are subsequently used to propose and develop a holistic *Maqasid al-Shariah*-based framework of measurement constructs.

4.2 Data Collection, Data Source, and Data Presentation Methods

4.2.1 Search Terms and Data Source

The following search terms were used in the Scopus database, taking into consideration their direct or indirect relationship with the halal economy:

TITLE-ABS-KEY ("Halal market" AND "Maqasid Shariah" OR "Shariah compliance in business" OR "Islamic economic principles" OR "measurement tools" OR "Shariah governance" OR "Sustainability" OR "Shariah-based key performance indicators" OR "Halal Economy" OR "ethical" OR "Shariah Compliance" OR "industry" OR "Systematic literature Review" OR "Halal Certification" OR "Governance" OR "Islamic Finance" OR "Innovations" OR "Future Trends" OR "Digital transformation").

4.2.2 Inclusion Criteria

The search terms were entered using advanced Boolean queries involving the operators “AND” and “OR”. The database was instructed to retrieve documents containing the specified terms in the title, abstract, and keywords. The initial search generated 131 documents and associated bibliographic information. Although no specific publication-year limit was imposed during the initial search, the retrieved documents were published between 2009 and 2024.

4.2.3 Main Data Source

Scopus was used as the primary data source. The search was conducted on 9 January 2025 and generated 131 documents. Following a review of the titles and abstracts, one document that was considered not directly relevant to the research scope was excluded. Consequently, 130 documents constituted the final dataset for analysis. The dataset was subsequently exported in CSV format and contained detailed bibliographic information for each document, including citation information, title, authors, abstract, publication year, and source or publisher information.

4.3 Instruments/Tools for Data Collection, Presentation, and Analysis

The study employed three main tools. First, the Scopus database was used to identify and retrieve the relevant documents and their bibliographic information. Second, Microsoft Excel was used to capture, store, and verify the bibliographic information generated from the Scopus database, particularly the abstracts of the retrieved documents, thereby facilitating access to the data without repeated login to Scopus. Third, VOSviewer Visualisation Software (version 1.6.19) was used to present the data through tables and visualisations, generate terms for analysis, and map the intellectual structure of the field to identify research trends, key authors, and potential directions for future research. The analysis was based solely on the Scopus database. This approach was adopted to maintain consistency in the bibliographic metadata and ensure compatibility with the VOSviewer analysis. Following bibliometric guidelines proposed by [Donthu et al. \(2021\)](#), the study maintained a single-database approach to ensure consistency in data retrieval and metadata processing.

4.4 Construct Derivation and Analysis Procedure

This procedure synthesises the *Maqasid al-Shariah*-based constructs derived from the bibliometric dataset through three stages. The first stage identifies the core thematic clusters generated through VOSviewer keyword co-occurrence analysis. The second stage examines the specific clusters and identifies operational metrics associated with the *Maqasid* dimensions (*Kulliyyat al-Khams*). The third stage synthesises these codes into a structured taxonomy of measurement constructs applicable across non-financial halal sectors.

4.5 Construct Validation and Investigator Triangulation Procedure

The study employs a three-author investigator triangulation protocol to address potential subjective bias in

cluster-to-theme labelling and the mapping of constructs to measurement instruments (Miles et al., 2014). The lead author initially conducted the thematic analysis and categorisation of the core keyword clusters for mapping to the *Maqasid* constructs. The second and third authors independently audited the initial coding framework against the raw bibliometric data and the relevant primary literature. The three authors subsequently conducted a joint peer-briefing session to discuss and resolve discrepancies in theme categorisation and content labelling until full consensus was achieved.

5. Results and Discussion

5.1 The Conceptual Landscape and Thematic Clusters in the Halal Economy

The VOSviewer text-mining and co-occurrence mapping revealed eight distinct thematic clusters capturing the intellectual structure and prominent research themes within the global halal economy literature.

Cluster 1: The Global Halal Ecosystem

This cluster encompasses foundational concepts, macro-level principles, regulatory frameworks, and product and service ecosystems (Qadri, 2024). Comprising approximately 40 core terms, the cluster focuses on international halal trade, standardised guidelines, food safety protocols, emerging supply-chain technologies, and regional operational practices. Fundamental to this cluster are the core concepts of *halal* (permissible) and *haram* (prohibited), which define the primary legal and ethical boundaries of Islamic jurisprudence (Abdullah & Azam, 2020). The cluster highlights the central role of *Shariah* governance across supply chains, emphasising compliance, integrity, consumer safety, and the deployment of distributed ledger technologies, such as blockchain, to enhance traceability and stakeholder trust.

Cluster 2: Halal Food Industry and Business Operations

This theme focuses on the operational, manufacturing, and commercial dimensions of the food and beverage sector (Riaz & Riaz, 2023). Key sub-themes include food processing technologies, firm-level business performance, consumer purchasing behaviour, and global trade dynamics, including import and export activities and certification regimes governed by bodies such as JAKIM. The co-occurrence of terms such as *halal cosmetics* within this cluster indicates diversification beyond traditional food processing and reflects expanding consumer demand for halal products across related sectors.

Cluster 3: Halal Tourism and Entrepreneurship

This cluster highlights two prominent service domains: Muslim-friendly tourism and entrepreneurship within the halal sector. The development of halal tourism reflects growing research interest in entrepreneurial activity, service innovation, and the opportunities and challenges associated with establishing halal-compliant service environments in Muslim-minority jurisdictions (Busari et al., 2024b). Key terms such as *halal tourism* and *halal entrepreneurship* demonstrate substantial scholarly interest in specialised hospitality services for Muslim travellers. Furthermore, geographical terms such as *Taiwan* and *Thailand* illustrate the international scope of halal tourism and highlight the challenges and opportunities associated with developing culturally inclusive and halal-friendly travel destinations (Biancone et al., 2019).

Cluster 4: Industry Development, Strategy, and Governance

This theme reflects strategic issues involving key stakeholders in the halal economy, including Muslim consumers, halal entrepreneurs, halal certification bodies (HCBs), regulatory agencies, and policymakers (Aulia & Azizah, 2024). The main research trajectories address national halal industry development strategies (Nu'man et al., 2023), corporate halal branding, and the formulation of evaluative indices and key performance indicators (KPIs). The prominence of terms such as *corporate halal reputation*, *framework*, and *index* suggests growing research interest in corporate reputation, governance frameworks, and multidimensional performance evaluation within the halal industry (Rahman et al., 2017).

Cluster 5: Halal Market Dynamics and Consumer Behaviour

This cluster examines market segmentation, branding, and promotional strategies, alongside the influence of regulatory bodies in shaping market access (Akram, 2020). Dominant terms include *halal consumer behaviour*,

brand development, and *marketing strategy*, together with institutional topics involving exporters and high-growth markets such as Chinese Muslim consumer segments. Terms including *customer satisfaction*, *brand loyalty*, and *consumer attitudes* underscore the importance of empirical research into consumer preferences and market behaviour. The cluster also highlights export expansion and trade strategies for halal products, particularly in non-Muslim-majority markets where halal products represent an important niche segment (Muhamad et al., 2016).

Cluster 6: Psychological Determinants of Halal Consumption

This cluster addresses the socio-psychological and behavioural drivers of consumer choice, focusing on attitudes, perceptions, knowledge, and purchase intentions. Terms such as *attitude*, *intention*, *knowledge*, and *religiosity* emphasise the importance of understanding the cognitive and behavioural factors influencing halal consumption (Abd Rahman et al., 2015; Farah, 2021; Muhamad et al., 2016). The presence of terms related to pharmaceuticals, personal care, and cosmetics indicates expanding research interest beyond dietary compliance, highlighting consumer perceptions of halal products and the roles of marketing, advertising, and religiosity in shaping product adoption across multiple sectors.

Cluster 7: Halal Finance, Social Impact, and Governance

This cluster covers the financial infrastructure and socio-economic contributions of the halal economy. Its primary sub-themes include Islamic banking operations, social finance integration, corporate profitability, and broader social welfare (*maslahah*). The co-occurrence of terms such as *profitability* and *social implication* reflects the coexistence of commercial and social dimensions within the halal sector (Güney, 2024). The inclusion of *family takaful* also demonstrates the relevance of specialised *Shariah*-compliant financial products within the broader halal ecosystem. Overall, the cluster reflects research interest in halal finance and its wider *Shariah*-related and socio-economic dimensions.

Cluster 8: Halal Marketing and Strategic Branding

This cluster represents an emerging research domain centred on brand positioning and market differentiation. It examines how halal-certified brands can communicate core values and differentiate themselves in the market while respecting Islamic ethical sensitivities (Sari et al., 2023). Sub-themes include Islamic apparel brand personality models, strategic brand development, and the role of market knowledge and research in supporting product innovation and understanding consumer needs (Idris et al., 2020).

5.2 Emerging Research Trajectories and Future Directions

While thematic clustering outlines the current intellectual structure of the field, text-mining relevance scores and overlay analyses reveal several emerging research trajectories and potential directions for future empirical inquiry. The relatively high occurrence of the term *challenge* indicates continued research interest in addressing obstacles facing the halal industry (Aulia & Azizah, 2024), including regulatory barriers (Badrudin et al., 2012), limitations in market access (Akram, 2020), and consumer trust issues (Farah, 2021). These areas warrant further investigation, particularly in relation to how regulatory and institutional arrangements influence the development and international competitiveness of the halal economy. Similarly, the relatively high occurrence of the term *opportunity* indicates growing research interest in emerging commercial possibilities within the halal sector (Talib & Ali, 2009). Potential areas include market expansion, the development of innovative halal products and services (Yener, 2014), and the exploration of new business models (Abdullah & Azam, 2021). These developments suggest opportunities for future research to examine how innovation, market diversification, and institutional support can contribute to the continued development of the halal economy.

The prominence of the term *consumer* highlights continued research interest in purchasing motivations, consumer preferences (Zulhilmi et al., 2023), behavioural intentions (Maulida & Ali, 2023), and the role of religiosity in halal consumption (Abd Rahman et al., 2015; Hong et al., 2019). Future studies could further examine how these factors interact across different halal product and service categories and geographical contexts, particularly as the halal economy expands beyond traditional food-related consumption.

The prominence of *export performance* indicates continued research interest in improving the international

competitiveness of halal products and services (Ahmad-Fauzi & Md Saad, 2024). Concurrently, *Muslim travel*, with a relevance score of 2.2641, indicates research interest in the needs and preferences of Muslim travellers (Al-Ansi et al., 2023), the development of Muslim-friendly tourism products and services (Battour et al., 2022; Biancone et al., 2019), and related aspects of destination and environmental design (Said et al., 2022). These themes provide potential avenues for future research into international halal market development and the provision of inclusive tourism environments.

The prominence of *corporate halal reputation* suggests growing research interest in building and maintaining corporate reputation in halal business settings, strengthening consumer trust, and attracting investment (Tieman, 2020). It also highlights a potential research gap concerning the development of standardised evaluation indices and key performance indicators (KPIs) (Ali Alamer et al., 2015; Rahman et al., 2017; Ramya, 2022). Similarly, *business performance*, with a relevance score of 1.5059, indicates continued interest in factors influencing firm-level performance within the halal sector, including profitability (Dalir et al., 2020), operational efficiency (Mohd Noor et al., 2016), technological innovation (Kabiraj et al., 2014), political and legal issues (Hassan et al., 2017), and certification effects (Salindal, 2019). Further research could also examine how financing, mentorship, and market access support halal entrepreneurship (Alidinar et al., 2022; Azmi et al., 2019). Several emerging technological and sustainability-related themes also offer significant potential for future research. The term *metaverse* highlights an emerging domain for examining digital halal experiences, including virtual mosque visits, immersive halal retail, and digital heritage tourism (Hindolia et al., 2024; Noor et al., 2024). Broader digitalisation initiatives (Salaheldeen, 2022), particularly blockchain applications for supply-chain transparency and traceability (Alamsyah et al., 2022), also warrant further investigation. Related technological research includes applications of the Technology Acceptance Model (TAM) in the halal economy (Noor, 2024). Finally, the prominence of *sustainable economy* indicates growing research interest in sustainability within halal operations, including environmentally friendly practices, green certification, and circular economy models (Busari & Sitiris, 2021; Shovkhalov, 2024; Zain et al., 2017).

Proposing A Maqasid Shariah-Based Measuring Constructs In Halal Economy

Thematic Issues in the Measurement of the Halal Economy

The key findings related to the measurement of the halal economy emerging from the foregoing thematic analysis revolve around several terms identified in Cluster Four (see Table 11), based on the VOSviewer analysis. This cluster contains several prominent terms related to measurement constructs, instruments, indices, and frameworks and was thematically labelled “Halal Industry Development and Challenges”. Although Cluster Four provides the primary point of departure for exploring measurement constructs and instruments, the study considers all eight clusters to provide a comprehensive overview of the major issues and research themes within the halal economy represented in the dataset.

Table 5. Showing cluster 4, segments from generated clusters from VOSview

CLUSTERS	KEYWORDS/TERMS	THEMES
CLUSTER FOUR (13 ITEMS)	Aceh, challenge, corporate halal reputation, corporate halal reputation index, framework, halal certification body, halal economy, halal marketing, marketing, metaverse, sale, stakeholder, Uzbekistan	Halal Industry Development and Challenges This section focuses on key players, challenges, and frameworks shaping the halal economy. Main themes include: industry development strategies, challenges, stakeholder roles, branding and reputation, KPI and measurement tools, and virtual marketing and customer engagement.

This cluster includes terms such as “corporate halal reputation”, “corporate halal reputation index”, and “framework”, which are closely associated with measurement and performance indicators. It reflects ongoing scholarly discussions on halal economy measurement frameworks and complements the broader themes identified across the eight clusters.

Corporate Halal Reputation/Reputation Index

The presence of these terms as prominent keywords in the cluster suggests a focus on measuring the reputation of businesses within the halal economy. This indicates potential interest in developing metrics or indices to assess how consumers perceive a company's commitment to *halal* standards, ethical practices, and social responsibility. Such measures could serve as useful tools for companies seeking to strengthen consumer trust and potentially gain a competitive advantage in the halal market.

Framework

The term “framework”, which occurs 31 times in the dataset, indicates the presence of various measurement instruments and constructs that form components of existing or proposed frameworks within the halal economy (Rahman et al., 2017). At the same time, its prominence reflects the continuing need for more structured approaches to measuring diverse dimensions of the halal economy (Ramya, 2022). Cluster Four particularly highlights themes related to measurement and framework development, including certifier performance, product quality, supply-chain integrity, and industry growth. Related terms such as *performance*, *halal status*, *integrity*, and *business/export performance* also appear across other clusters, underscoring the growing importance of measurement constructs within different dimensions of the halal economy. In Cluster Two, “Halal Food Industry and Business”, the presence of terms such as *business performance* points to the importance of measuring profitability, operational efficiency, and customer satisfaction. Cluster Five, “Halal Market and Consumer Behaviour”, includes terms related to export performance and consumer engagement, highlighting market reach, consumer responses, and loyalty as important areas of measurement. Across the clusters, recurring terms related to consumer perception, social impact, and market trends further highlight the importance of assessing ethical practices, consumer attitudes, and broader sectoral development. Taken together, the findings indicate that the principal measurement themes emerging from the analysis encompass business performance, corporate halal reputation, market and consumer behaviour, product perception, financial and social impact, industry development, and related challenges.

A Critical Analysis of Current Issues in the Measurement of Halal Economy

The foregoing bibliometric analysis underscores ongoing scholarly efforts to formulate measurement instruments and evaluative frameworks for managing, developing, and evaluating the halal economy. Existing literature focuses heavily on corporate reputation, firm performance, product quality, supply-chain integrity, and consumer purchasing behaviour. However, the majority of measurement constructs identified in the dataset exhibit a narrow operational scope. For instance, constructs such as “Corporate Halal Reputation” and the “Reputation Index” concentrate primarily on corporate reputation and related dimensions (Alswalmeh et al., 2019). While these measures are important for strengthening corporate reputation and building consumer trust, they give limited explicit attention to the broader ethical dimensions underlying corporate activities and reputation. Crucially, these constructs are not explicitly grounded in *Maqasid al-Shariah* as an evaluative basis for assessing the broader socio-economic implications of commercial activities. Across the reviewed literature, two overarching analytical limitations emerge: (a) a fragmented focus on isolated operational dimensions of the halal economy and (b) a lack of explicit theoretical grounding of measurement constructs in *Maqasid al-Shariah*.

A limited subset of the reviewed literature attempts to integrate *Maqasid*-informed frameworks, although their scope remains highly domain-specific. Notable examples include performance measurement models for the halal industry (Rahman et al., 2017), compatibility performance indicators (Mohiuddin & Danish, 2023), and employee motivation indices (Abdullah et al., 2023). Notwithstanding these contributions, the existing constructs remain tailored to specific products, services, or organisational dimensions. Consequently, they do not provide a holistic measurement architecture capable of capturing the interconnected ethical, social, and socio-economic dimensions of the global halal economy. Furthermore, although the literature corpus includes studies examining *Maqasid al-Shariah*, as reflected in the initial Boolean search query, the term itself did not meet the minimum occurrence threshold ($n \geq 5$) for inclusion in the VOSviewer term map. This finding indicates that explicit *Maqasid al-Shariah* terminology occurs with relatively low frequency in the title and abstract metadata of the studies included in the dataset. While this does not imply an absence of *Maqasid*-oriented research, it highlights the limited explicit operationalisation of *Maqasid al-Shariah* into standardised measurement metrics within the halal economy literature. This observation is consistent with broader critiques

that *Maqasid al-Shariah* has yet to be systematically translated into actionable empirical evaluation tools for the halal market (Maulida & Ali, 2023). Accordingly, a compelling opportunity exists to operationalise the core objectives of *Maqasid al-Shariah* into measurable constructs capable of evaluating the halal economy across its multi-sectoral ethical, social, and economic dimensions.

Proposing a Comprehensive Maqasid Shariah-Based Measuring Framework in the Halal Economy: The Dimensions and Significance

Given the paucity of studies applying *Maqasid al-Shariah* to the development of measurement tools for the halal economy, this section proposes a holistic framework grounded in *Maqasid al-Shariah* principles, emphasising a structured, values-based approach to evaluating the halal economy. The framework seeks to align measurement efforts with the objectives of *Shariah* while incorporating considerations of economic viability, ethical integrity, and societal well-being. It further expands key measurement dimensions into more specific constructs and indicators, thereby providing a structured and practical basis for evaluating performance across the halal economy.

The Constitutive elements/ideas and Characteristics of the Proposed Framework

The proposed framework for measuring the halal economy is structured around four constitutive elements: (a) *Maqasid al-Shariah* dimensions, (b) halal economy sectors, (c) measurement constructs, and (d) measurement instruments or metrics. These elements are conceptually interconnected through a set of linkages that explain how the *Maqasid al-Shariah* dimensions inform the development of measurement constructs and their application across different sectors of the halal economy.

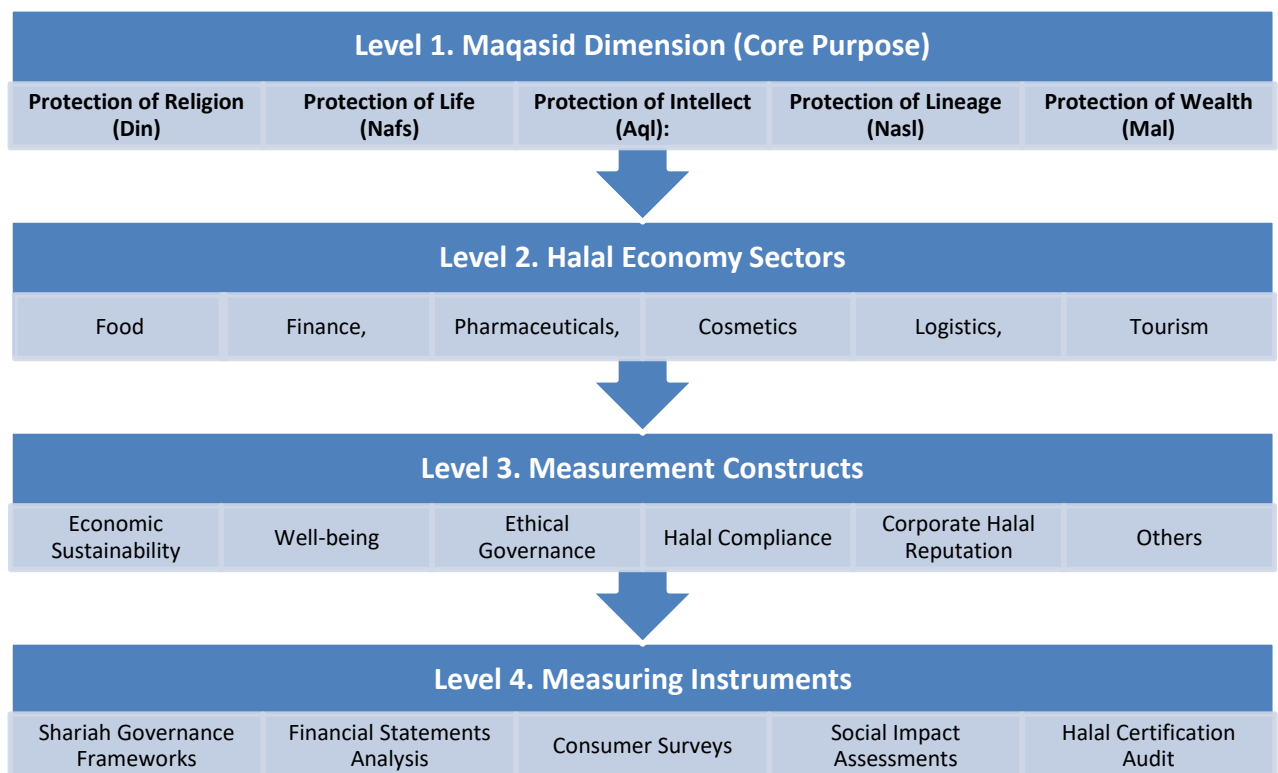


Figure 5: An estimated sketch of the *Proposed Maqasid Shariah-based Measuring Framework* (except level 1, items under other levels are not exhaustive, with level 2 being fine. Table 6 below gives the broader picture more accurately.

1. Maqasid al-Shariah Dimensions (Kulliyyat al-Khams)

The five essential objectives (daruriyyat) of Maqasid al-Shariah—safeguarding faith (din), life (nafs), intellect ('aql), lineage (nasl), and wealth (mal)—represent the foundational objectives of Islamic law aimed at promoting public benefit (maslahah) and preventing harm (mafsadah). Within the halal economy, these dimensions serve as an overarching ethical framework for orienting commercial activities beyond exclusive profit maximisation towards broader socio-spiritual and economic well-being. They establish a normative basis for distinguishing the halal economy from conventional commercial models and for aligning market activities with the higher objectives of Islamic law.

2. Halal Economy Sectors (Application Domains)

This element encompasses the specific market sectors in which Shariah principles are applied, demonstrating that the halal economy extends beyond dietary compliance. The framework covers core sectors including Islamic finance, food and beverages, pharmaceuticals, cosmetics, Muslim-friendly tourism, logistics, and modest fashion. This sectoral breadth illustrates the evolution of the halal economy from a niche market segment into a diverse global economic ecosystem characterised by complex supply chains and distinct regulatory requirements.

3. Operational Measurement Constructs (What to Measure)

Measurement constructs represent conceptual variables derived by mapping the Maqasid al-Shariah dimensions onto specific halal sectors. They translate abstract Islamic objectives into defined evaluative categories that can subsequently be operationalised through observable indicators. For instance, the preservation of wealth (Hifz al-Mal) may be operationalised through constructs relating to financial sustainability, risk-sharing, socio-economic resilience, and equitable wealth distribution. Similarly, the protection of life (Hifz al-Nafs) may be reflected in constructs relating to product safety, nutritional integrity, workplace health, and consumer well-being. This structural mapping provides a systematic foundation for developing and empirically evaluating sector-specific performance measures.

4. Measuring Instruments and Metrics (How to Measure)

This component identifies the empirical tools, quantitative indicators, and qualitative measures that can be used to operationalise the derived measurement constructs. Potential instruments include standardised certification and audit protocols, laboratory-based quality and safety assessments, consumer surveys, environmental compliance indicators, and financial stability ratios, depending on the specific construct and sector being evaluated. The selection of appropriate and reliable instruments is essential for converting conceptual constructs into observable data and supporting rigorous, consistent, and empirically testable evaluations across diverse halal economy sectors.

5. Conceptual Linkages and Operational Pathway

The central architectural feature of the framework lies in its sequential and integrated operational pathway:

Maqasid al-Shariah Dimensions → Halal Economy Sectors → Measurement Constructs
→ Measuring Instruments and Metrics

This structural pathway provides a transparent mechanism through which higher Islamic objectives inform sector-specific measurement constructs, which can subsequently be operationalised and evaluated using appropriate empirical instruments. For example, within the halal food sector, the preservation of life (Hifz al-Nafs) may inform operational constructs relating to food safety, product quality, and public health. These constructs can then be assessed through appropriate food-safety testing, laboratory-based quality assessments, and relevant halal certification and audit procedures. Through these linkages, the framework provides a multidimensional assessment architecture that remains grounded in Maqasid al-Shariah while incorporating relevant economic, environmental, and corporate governance considerations.

Table 6: Synthesized Maqasid Shariah-Based Measuring Constructs and Instruments Mapped to Empirical Bibliometric Clusters

Maqasid Dimension (Core Purpose)	Source VOSviewer Cluster & Keyword Anchors	Halal Economy Sectors (Application Area)	Measurement Constructs (What to Measure)	Measuring Instruments (How to Measure)
Protection of Religion (Din)	Cluster 1 & 2 (<i>Islamic Law, Certification, Halal Integrity, Jakim, Shariah, Blockchain</i>)	Food, Finance, Pharmaceuticals, Cosmetics, Logistics, Other	Ethical Governance, Halal Compliance, Corporate Halal Reputation	Shariah Governance Frameworks, Halal Certification Audits, Reputation Indices, Blockchain Traceability, KPIs
Protection of Life (Nafs)	Cluster 1 & 6 (<i>Safety, Hygiene, Halal Cosmetic, Pharmaceutical, Food Product, Personal Care</i>)	Food, Pharmaceuticals, Cosmetics, Tourism	Well-being, Halal Compliance, Consumer Behavior	Consumer Surveys, Social Impact Assessments, Halal Certification Audits
Protection of Intellect (Aql)	Cluster 4 & 6 (<i>Knowledge, Innovation, Metaverse, Personal Care Industry, Education/Training</i>)	All Sectors (cross-cutting)	Innovation & Knowledge, Consumer Behavior	R&D Metrics, Education/Training Program Assessments, Consumer Surveys
Protection of Lineage (Nasl)	Cluster 3 & 7 (<i>Social Implications, Family Takaful, Sustainable Economy, Hospitality</i>)	All Sectors (cross-cutting)	Well-being, Corporate Halal Reputation	Social Impact Assessments, Consumer Surveys, Reputation Indices
Protection of Wealth (Mal)	Cluster 2 & 7 (<i>Business Performance, Export, Profitability, Halal Finance, Supply Chain, Trade</i>)	Finance, Food, Logistics, Other Sectors	Economic Sustainability, Ethical Governance, Halal Compliance, Corporate Halal Reputation, Consumer Behavior	Financial Statements Analysis, KPIs, Shariah Governance Frameworks, Halal Certification Audits, Supply Chain Traceability, Reputation Indices

The analytical protocol explicates the construct derivation and traceability framework, establishing the empirical basis for the operational measurement constructs and evaluation instruments summarised in Table 6. Each construct is systematically mapped to its corresponding VOSviewer keyword cluster and the primary terms identified within that cluster. For instance, evaluative instruments categorised under the Preservation of Intellect (*Hifz al-'Aql*) dimension, specifically R&D intensity metrics and technical capacity-building assessments, are informed by high-frequency terms such as *knowledge* in Cluster 6, alongside technology-related terms such as *metaverse* and sectoral terms such as *personal care industry* identified in Cluster 4. Similarly, socio-ethical indicators under the Preservation of Lineage (*Hifz al-Nasl*) dimension are informed by terms associated with *social implication* and *family takaful* in Cluster 7, together with sustainability-related themes identified in Cluster 3. This structural alignment establishes transparent traceability between the bibliometric co-occurrence clusters and the proposed multi-sectoral measurement constructs.

In assessing the broader literature, [Rahman et al. \(2017\)](#) observe that while *Maqasid al-Shariah*-based evaluative models have been developed for Islamic financial institutions, non-financial halal enterprises lack similarly tailored measurement instruments. Consequently, measurement in non-financial sectors may rely

heavily on conventional financial indicators, which may not adequately capture broader social and ethical dimensions. Similarly, [Mohiuddin and Danish \(2023\)](#); [Abdullahi, et al., \(2026\)](#) emphasise the utility of *Maqasid*-aligned metrics for evaluating institutional performance beyond short-term financial returns and highlight the need for empirical tools to assess broader *Shariah* compatibility. In contrast to prior bibliometric reviews that focus predominantly on Islamic banking, this study expands the scope of inquiry to the broader halal economy. By integrating quantitative bibliometric mapping with qualitative thematic interpretation, the study provides an empirically informed and traceable framework for translating higher *Maqasid al-Shariah* objectives into proposed operational measurement constructs across diverse commercial sectors.

7. Research Implications

The findings and derived conceptual taxonomy of this study offer meaningful implications across managerial and organisational practice, regulatory frameworks and certification standards, consumer rights and market transparency, and curriculum design and higher education. Although the measurement constructs derived in Table 6 require further empirical validation, they provide an actionable design blueprint for halal industry managers, corporate executives, and operational practitioners. Rather than functioning as a fully validated measurement instrument, the proposed taxonomy serves as a strategic guide for strengthening internal *Shariah* governance, structuring employee training and capacity development related to the Protection of Intellect (*Hifz al-'Aql*), and establishing ethical supply-chain traceability mechanisms aligned with the Protection of Faith (*Hifz al-Din*) and Protection of Wealth (*Hifz al-Mal*). Consequently, the framework provides organisations with a conceptual basis for aligning conventional performance measures with broader socio-ethical and *Shariah* objectives.

The framework also provides strategic insights for regulatory bodies, standard-setting agencies, and national halal certification authorities, including JAKIM in Malaysia and BPJPH in Indonesia. It offers a conceptual basis for considering the extension of halal evaluation beyond narrow product-specific compliance towards broader dimensions of corporate ethics, environmental sustainability, and socio-economic responsibility. Within the Malaysian context, the framework could complement existing halal standards by providing *Maqasid al-Shariah*-based dimensions for future policy and standard-setting discussions. Potential areas of application include supply-chain traceability, corporate reputation, technological capability, product safety and quality, and community welfare. However, incorporating such multidimensional constructs into formal regulatory or certification standards would require extensive multi-stakeholder consultation, appropriate standard-setting processes, and rigorous empirical validation. The proposed framework also has potential implications for consumer empowerment by extending the conceptual scope of halal assurance beyond technical compliance to encompass product safety, ethical sourcing, corporate responsibility, and consumer well-being. By aligning performance measures with *Maqasid al-Shariah* dimensions such as the Protection of Life (*Hifz al-Nafs*) and Protection of Intellect (*Hifz al-'Aql*), the framework provides a basis for examining how halal goods and services may contribute to broader public welfare (*maslahah*). The development of transparent and empirically validated indicators across sectors such as pharmaceuticals, cosmetics, tourism, and food logistics could strengthen consumer confidence by providing verifiable information on dimensions beyond binary *halal-haram* status. In this respect, the framework may support more informed consumer decision-making and contribute to greater transparency and trust within halal markets.

Finally, the study offers potential applications for curriculum design in Islamic economics, Islamic finance, and halal industry management programmes. The proposed taxonomy functions as a pedagogical bridge connecting abstract *Maqasid al-Shariah* principles with practical industry evaluation. Educators can utilise the derived constructs to develop case studies, field-based auditing exercises, and specialised modules addressing *Shariah* governance, supply-chain integrity, performance measurement, and socio-economic impact assessment. Such practical integration can help students understand how *Maqasid al-Shariah* principles may be translated into operational evaluative dimensions across diverse sectors of the global halal economy.

7.1 Limitations and Future Research Directions

While this study offers a comprehensive thematic mapping of the halal economy literature, several methodological limitations must be acknowledged. First, the dataset was retrieved exclusively from the Scopus database, meaning that relevant scholarly publications indexed solely in Web of Science or published in non-

indexed regional journals were not included in the bibliometric analysis. Second, although the data-cleaning protocol was guided by a three-author investigator triangulation process, manually filtering candidate terms from 194 to 119 inevitably involved a degree of qualitative judgement. Third, the operational measurement constructs synthesised in Table 6 represent a derived conceptual taxonomy rather than empirically validated measurement instruments. Future research should address these limitations by cross-validating the bibliometric findings across multiple databases, employing systematic and reproducible computational term-curation procedures, and empirically validating the proposed constructs through rigorous quantitative scale-development methods, including exploratory and confirmatory factor analysis.

8. Conclusion and Recommendations

Contemporary literature reflects ongoing efforts to formulate evaluative frameworks across the expanding sectors of the global halal economy. However, existing research remains largely fragmented and domain-specific, with limited explicit attention to structuring measurement constructs around *Maqasid al-Shariah* as an overarching analytical framework. This study contributes to addressing this gap by synthesising bibliometric evidence into a multi-sectoral conceptual framework that provides a basis for examining how the higher objectives of Islamic law can inform performance evaluation across the halal economy. The proposed framework provides an exploratory roadmap, positioning *Maqasid al-Shariah* dimensions as foundational considerations for evaluating commercial impacts across halal food, Islamic finance, Muslim-friendly tourism, and pharmaceuticals. Consequently, it provides a transparent conceptual baseline for examining how industry practices may align with *Shariah* principles while supporting ethical, sustainable, and welfare-oriented socio-economic development. Nevertheless, because the framework is derived from bibliometric mapping and thematic interpretation, the proposed taxonomy represents a preliminary conceptual baseline rather than an operationalised measurement system. Future empirical research should operationalise the derived constructs, formulate and test measurement items, and establish context-specific quantitative metrics to evaluate construct reliability, convergent validity, and practical utility. Additionally, empirical studies should examine the applicability of these constructs across diverse geographical jurisdictions and regulatory environments to enhance their generalisability. Such research could contribute to the development of a more holistic and standardised approach to evaluating the socio-economic impact of the global halal economy. Ultimately, this study represents an exploratory step towards translating abstract *Maqasid al-Shariah* principles into actionable measurement and governance dimensions, offering a bibliometric and thematic synthesis of the contemporary literature and a foundation for future empirical research.

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Regulatory Framework For Islamic Finance In Brunei Darussalam: A Critical Analysis

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Abstract

The development of Islamic finance in Brunei Darussalam commenced with the establishment of Tabung Amanah Islam Brunei (TAIB) in 1991. Under the auspices of the Brunei Darussalam Central Bank (BDCB) and with the continued support of the Ministry of Finance and Economy (MOFE), the nation has progressively strengthened its position within the global Islamic finance sector. A robust regulatory framework is imperative to sustain this development, attract investment, and foster stakeholder engagement. Nevertheless, despite this progress, the sector's regulatory infrastructure requires continuous refinement to keep pace with industry advancements. While the Islamic Banking Order (IBO) 2008 established a foundational legal structure, several provisions require revision and enhancement to meet contemporary market demands. This paper critically analyses the current regulatory framework governing Islamic finance in Brunei Darussalam. Employing qualitative documentary analysis, the study examines primary legal instruments, including Acts, Orders, Guidelines, and Notices, supplemented by secondary academic literature. The findings reveal that additional legislative measures are essential to establish a more comprehensive and resilient regulatory framework. Although Brunei Darussalam currently has only one full-fledged Islamic bank, a robust regulatory framework remains critical to ensuring the effective and consistent application of *Shariah* principles across Islamic financial operations. The paper concludes by offering targeted policy recommendations for the relevant regulatory authorities, thereby contributing to the broader discourse on strengthening the legal and regulatory architecture of Islamic finance.

Keywords: Regulatory framework; Islamic finance; Brunei Darussalam; Shariah compliance; Islamic banking laws

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Introduction

Over the past few decades, Brunei Darussalam has progressively developed its Islamic banking and finance sector, which has emerged as an important component of the nation's financial services industry. The country commenced its journey into Islamic finance with the establishment of its first Islamic financial institution, Tabung Amanah Islam Brunei (TAIB), in 1991. Since then, the sector has witnessed substantial expansion in terms of the number and diversity of financial institutions and services. The ICD Thomson Reuters Islamic Finance Development Indicator for 2014 ranked Brunei Darussalam 10th among 92 countries practising Islamic finance (Yaacob, Basir, Yaacob, & Ali, 2021). This ranking underscores the nation's potential to assume a more prominent role within the global Islamic finance industry, particularly in Islamic investment management and *takaful* (Islamic insurance) services. In line with the national vision, Wawasan Brunei 2035, the financial sector, including Islamic finance, is projected to increase its contribution to gross domestic product (GDP) to 8% by 2035 (Zul Kepli, 2014).

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Brunei Darussalam operates under a dual legal system encompassing both English common law and *Shariah* law (Zul Kepli, 2014; Yaacob, 2018). This legal framework accommodates both conventional and Islamic financial activities. The Islamic finance industry in Brunei Darussalam can be broadly categorised into three primary segments: Islamic banking, *takaful*, and the Islamic capital market. To regulate these sectors, a series of Orders and Acts have been enacted to ensure that Islamic financial products and operations comply with *Shariah* principles (Yaacob, 2024). The regulatory framework for Islamic finance in Brunei Darussalam is anchored by several key legislative instruments. Islamic banking activities are primarily governed by the Islamic Banking Order (IBO) 2008, while the *takaful* sector is regulated under the Takaful Order 2008. Furthermore, Islamic capital market activities are regulated by the Securities Market Order (SMO) 2013 and its subsidiary legislation, the Securities Markets Regulations (SMR) 2015. The Brunei Darussalam Central Bank (BDCB) administers and supervises these regulatory instruments as part of its mandate to promote monetary and financial stability. Islamic financial institutions in Brunei Darussalam are also subject to prudential standards and reporting requirements. Additionally, Islamic banks must comply with the Guideline on Compliance and Compliance Function issued by the BDCB in 2018, which is aligned with the principles established by the Basel Committee on Banking Supervision.

As stated in *The Compliance Function in Banks*:

“Compliance with laws, rules and standards helps to maintain the bank’s reputation with, and thus meet the expectations of, its customers, the markets and society as a whole.”

Building on this premise, strengthening the Islamic finance industry requires a comprehensive legal and regulatory framework capable of enhancing operational efficiency, maintaining financial stability, and supporting sustainable development. Previous studies have emphasised the importance of an effective regulatory regime in supporting the development of Islamic finance (Markom, 2016; Syarif, 2019; Yaacob, 2018, 2026). Against this backdrop, this paper critically examines the regulatory framework governing Islamic finance in Brunei Darussalam, with particular emphasis on the need for a cohesive legal and regulatory structure to support the industry's continued development. This study encompasses the major segments of Islamic finance in Brunei Darussalam, namely Islamic banking, *takaful*, the Islamic capital market, and other specialised areas within the industry. Furthermore, the regulatory framework is examined in the context of Islamic social finance, particularly concerning matters that fall under the jurisdiction of the Islamic Religious Council and the *Shariah* Courts. Methodologically, the study employs qualitative documentary analysis involving a systematic examination of primary legal and regulatory instruments, including Acts, Orders, Guidelines, and Notices. These primary sources are supplemented by secondary literature, including academic journal articles and books, to provide a comprehensive assessment of the regulatory landscape governing Islamic finance in Brunei Darussalam.

2. Literature Review

The Islamic finance industry constitutes an important component of Brunei Darussalam's financial system and broader economic development. As noted by Yaacob et al. (2021), His Royal Highness Prince Haji Al-Muhtadee Billah, the Crown Prince and Senior Minister at the Prime Minister's Office, emphasised that Islamic finance, when grounded in *Shariah* principles, contributes to the development of a stable global Islamic financial system. His Royal Highness also called upon the Brunei Darussalam Central Bank (BDCB)—formerly the Autoriti Monetari Brunei Darussalam (AMBD)—and other relevant agencies to strengthen their collaborative efforts in support of His Majesty's vision to establish Brunei Darussalam as a globally recognised Islamic financial hub. The development of Brunei Darussalam's Islamic finance industry can be traced to a royal decree issued by His Majesty the Sultan and Yang Di-Pertuan on 25 September 1990, during a meeting of the Islamic Religious Council (*Majlis Ugama Islam Brunei*) (Zul Kepli, 2014). In his address, His Majesty underscored the establishment of an Islamic bank as a *fard kifayah*, referring to a communal religious obligation (Ebrahim & Tan, 2001; Yaacob, 2024). This directive catalysed the formal development of Islamic banking in the country, culminating in the establishment of Tabung Amanah Islam Brunei (TAIB) in 1991, the country's first Islamic trust fund. Established primarily to facilitate financial preparations for the *Haji* pilgrimage among local Muslims, TAIB marked an important milestone in the development of Islamic finance in Brunei Darussalam, as it became the first domestic financial institution to operate in accordance with Islamic principles.

The sector continued to develop in 1993 when the Island Development Bank, previously a conventional institution, was converted into the country's first full-fledged Islamic bank and subsequently renamed the Islamic Bank of Brunei. Another significant development occurred in 2005 with the formation of Bank Islam Brunei Darussalam (BIBD). BIBD was established through the merger of the Islamic Bank of Brunei and the Islamic Development Bank of Brunei and has since become the country's largest banking institution and a leading Islamic financial institution (Zul Kepli, 2014).

This institutional development underscores the importance of an effective legal and regulatory framework. Syarif (2019) argues that jurisdictions require a regulatory framework that integrates *Shariah* principles into the national legal system while encompassing the regulatory requirements necessary for the effective operation of Islamic finance. A robust legal framework can enhance investor confidence and mitigate systemic risks that may undermine financial stability. Accordingly, regulatory regimes need to evolve in response to emerging market challenges and address identified legislative and regulatory gaps to support the continued development of Islamic finance.

Similarly, Markom (2016) advocates the implementation of key strategic areas identified in the *World Islamic Banking and Finance Report 2016* to address challenges facing the Islamic finance industry and promote equitable financial practices. These include establishing a supportive regulatory environment through the consistent application of Basel III and Islamic Financial Services Board (IFSB) standards, addressing systemic risks arising from dual banking systems, and strengthening cross-border supervisory mechanisms. Khan et al. (2015) likewise highlight the need for a harmonised regulatory and supervisory framework to address contemporary challenges in Islamic banking. They further argue that greater consensus among *Shariah* scholars is important for promoting greater standardisation in the regulatory framework governing Islamic finance. Yaacob (2024) further emphasises the importance of an appropriate regulatory framework in highly regulated sectors such as finance. Effective regulation can encourage market participation and investment by fostering trust and confidence among stakeholders. A transparent regulatory framework defines the rights and obligations of market participants and establishes the requirements governing their activities. From a public policy perspective, effective regulatory governance is important to ensure that regulatory interventions are transparent, proportionate, equitable, and consistently enforced. In this context, a regulatory framework may be understood as a system of rules, guidelines, and enforcement mechanisms established by the relevant authorities to regulate a particular sector.

Providing a broader perspective on banking and financial systems, Yaacob (2018), in *The World Banking System*, examines the historical development and operations of financial institutions and the relationship between domestic banking regulations and the international financial system. This perspective provides a useful basis for understanding the regulatory environment of Islamic finance and highlights the importance of aligning domestic regulatory frameworks with developments in the international financial system.

3. Research Methodology

3.1 Research Design

This study adopts a qualitative documentary analysis approach to examine the regulatory framework governing Islamic finance and *Shariah* compliance in Brunei Darussalam. This approach is appropriate because the study primarily seeks to examine, interpret, and synthesise legal and regulatory requirements through documentary evidence (Morgan, 2021). Accordingly, the analysis focuses on primary legislation, regulatory instruments, and relevant academic literature.

The analysis is principally doctrinal in nature, as it examines the content, scope, and interrelationships of the legal and regulatory instruments governing Islamic banking in Brunei Darussalam. A qualitative analytical approach is also employed to examine the regulatory structure, institutional responsibilities, *Shariah* compliance requirements, and implementation mechanisms established within the existing framework.

3.2 Sources of Documents

The documentary sources analysed in this study comprise both primary and secondary sources. Primary sources include relevant Acts, Orders, and Regulations, such as the Islamic Banking Order 2008, the Brunei Darussalam Central Bank Order 2010, and the Syariah Financial Supervisory Board Order 2006, as well as guidelines, standards, and notices issued by Brunei Darussalam Central Bank (BDCB) and the Syariah Financial Supervisory Board (SFSB). Secondary sources comprise peer-reviewed journal articles, academic books, research papers, and other scholarly publications relating to Islamic finance, Islamic banking regulation, *Shariah* governance, regulatory compliance, and the development of Islamic finance in Brunei Darussalam.

Relevant sub-regulatory instruments, including notices, guidelines, and standards issued by the regulatory authorities, were also examined alongside applicable international standards and frameworks.

The documentary review was conducted by identifying and examining the principal legal and regulatory instruments relevant to Islamic banking in Brunei Darussalam. Documents were selected based on their direct relevance to the research objectives and their regulatory significance. The review focused on provisions concerning the establishment and regulation of Islamic financial institutions, regulatory and supervisory authority, *Shariah* governance, product approval, *Shariah* compliance, internal controls, *Shariah* audit, monitoring, and reporting. Relevant academic literature was reviewed alongside primary legal sources to support the interpretation of regulatory provisions and provide scholarly perspectives on Islamic finance regulation and *Shariah* governance.

4. Discussion

4.1 Regulatory Framework

The regulatory framework governing a financial institution provides the basis for regulating its activities and facilitating the achievement of its objectives. Enhancing operational efficiency, promoting financial stability, mitigating risks, and supporting broader economic development depend substantially on the effectiveness of this regulatory framework (Syarif, 2019). In the context of Islamic finance, the regulatory framework is complemented by a *Shariah* governance framework, which establishes mechanisms for overseeing Islamic financial institutions and ensuring compliance with *Shariah* principles in their operations (Elasrag, 2014).

Broadly, the regulatory framework governing Islamic finance in Brunei Darussalam can be categorised into six principal areas, each supported by specific Orders, Acts, regulations, and subsidiary regulatory instruments. These areas are outlined as follows:

Islamic banking: Islamic banking is primarily regulated under the Islamic Banking Order (IBO) 2008, which provides the principal legal framework for Islamic banking activities in the country. The Order is supplemented by the Islamic Banking (Miscellaneous Provisions) Regulations 2008, particularly in relation to licensing requirements.

Takaful: The *takaful* (Islamic insurance) industry is regulated under the Takaful Order 2008, which provides the primary regulatory framework for the sector. It is supplemented by the Takaful Regulations 2008, which include requirements relating to the licensing of *takaful* operators.

Islamic capital market: Islamic capital market activities are primarily regulated under the Securities Market Order (SMO) 2013.

Islamic social finance: Islamic social finance activities are regulated predominantly under the Religious Council and Kadhi Courts Act (Chapter 77) and related legislation. This legal framework was further developed in 2018 through the introduction of specific legislation relating to *hibah* (gifts).

Digital currency and cryptocurrency: Digital currency and cryptocurrency activities are not currently governed by a dedicated framework under specific Islamic finance legislation. Nevertheless, certain provisions of the Electronic Transactions Act 2001 may apply to transactions conducted in digital form.

Specialised financial activities: Specialised financial activities, including money-changing, remittance businesses, pawnbroking, and money-lending, are governed by their respective Orders and Acts.

As the Islamic finance industry has expanded, the establishment of appropriate rules and regulations has become increasingly important for governing its activities and ensuring the *Shariah* compliance of financial products and services. The introduction of diverse financial products by Islamic financial institutions has necessitated effective mechanisms for assessing their conformity with Islamic principles. Consequently, *Shariah* boards have been established within Islamic financial institutions to review, oversee, and monitor the *Shariah* compliance of their products and operations.

At the international level, several standard-setting bodies have been established to develop standards, guidelines, and supporting infrastructure for the global Islamic financial industry. Prominent institutions include the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), the Islamic

Financial Services Board (IFSB), the International Islamic Liquidity Management Corporation (IILM), the Islamic International Rating Agency (IIRA), and the International Islamic Financial Market (IIFM) (Syarif, 2019). These institutions contribute to the development of common standards and regulatory practices, thereby promoting greater consistency in the application and interpretation of *Shariah* principles across jurisdictions.

Shariah compliance provides benefits not only from a regulatory perspective but also to financial institutions, their customers, governments, and the broader socio-economic development of a country. To realise these benefits, Islamic financial institutions require effective *Shariah* governance mechanisms. Central to this framework is the *Shariah* board, which is generally composed of Islamic scholars responsible for reviewing and determining whether an institution's products, services, and operations comply with *Shariah* principles. In many jurisdictions, the establishment of a *Shariah* board is a statutory requirement. Effective *Shariah* governance is therefore an important component of a sound regulatory and supervisory framework for ensuring the continued development and integrity of the Islamic finance sector.

In line with international financial developments, Brunei Darussalam operates a dual banking system encompassing both conventional and Islamic financial institutions. The coexistence of these systems necessitates regulatory and institutional mechanisms that promote consistency, systemic stability, and effective supervision. The development of modern banking regulation has also been influenced by international standardisation efforts. As Yaacob (2018, 2024) notes, the development of international banking standards can be traced to important institutional milestones, including the establishment of the Bank for International Settlements in 1930 and the Bretton Woods arrangements in 1944.

In jurisdictions operating dual financial systems where conventional money markets are highly developed, Islamic banks frequently operate in an environment in which conventional interest rates influence market pricing. The interaction between conventional and Islamic financial systems can affect the funding costs of Islamic banks, the returns on Profit-Sharing Investment Accounts (PSIAs), and the pricing of Islamic financing facilities. Furthermore, Islamic financial markets in such jurisdictions may lack equivalent money-market instruments and sovereign yield curves that could serve as independent benchmarks for pricing Islamic financial products. Consequently, some Islamic banks may rely on conventional interest-rate benchmarks when pricing contracts such as *Murabahah* (cost-plus financing) and *Ijarah* (leasing) (Yaacob, 2024).

5. Analysis

According to Yaacob (2018), in The World Banking System, the regulatory framework of Islamic finance operates within structures similar to those governing conventional banking. Institutions at Layer 1 function as “silent regulators” by indirectly influencing the financial system. These include organisations such as the World Bank, International Monetary Fund (IMF), International Organization of Securities Commissions (IOSCO), Bank for International Settlements (BIS), Financial Stability Board (FSB), and Financial Action Task Force (FATF), among others. These institutions establish regulatory and supervisory frameworks for prudential oversight, promote fair and transparent financial markets, and support financial integrity by addressing issues such as money laundering and terrorist financing. Yaacob (2018) further illustrate the relationship between the functioning of the banking system and the roles of these regulatory institutions. International standards issued by these organisations are transmitted to central banks, which subsequently disseminate the relevant information, standards, guidelines, and directives. Such standardisation is essential for harmonising financial practices and facilitating greater integration within the global financial system.

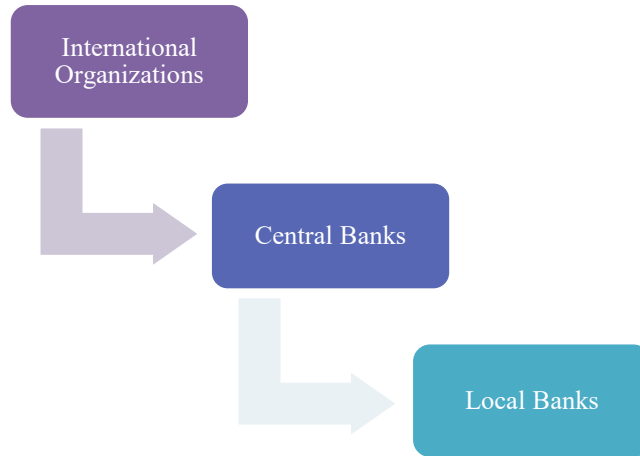


Figure 1: The three layers relationships – standards.

As shown in Figure 1, the interaction among the three layers contributes to the standardisation and implementation of financial practices. Over time, local institutions adopt the standards established at the international level. Once integrated into national jurisdictions and institutions, these standards are monitored and reviewed to ensure compliance. Such compliance requires consistent adherence to the established regulatory requirements. Figure 2 further illustrates the relationship among Layer 1, Layer 2, and Layer 3. Layer 2, comprising central banks worldwide, implements the policies and mandates established by Layer 1 and transmits them to Layer 3, which consists of local banks within each jurisdiction. Thus, regulations and standards developed at Layer 1 are channelled through Layer 2 at the central bank level and ultimately implemented at Layer 3 by both conventional and Islamic banks, as depicted in Figure 2.

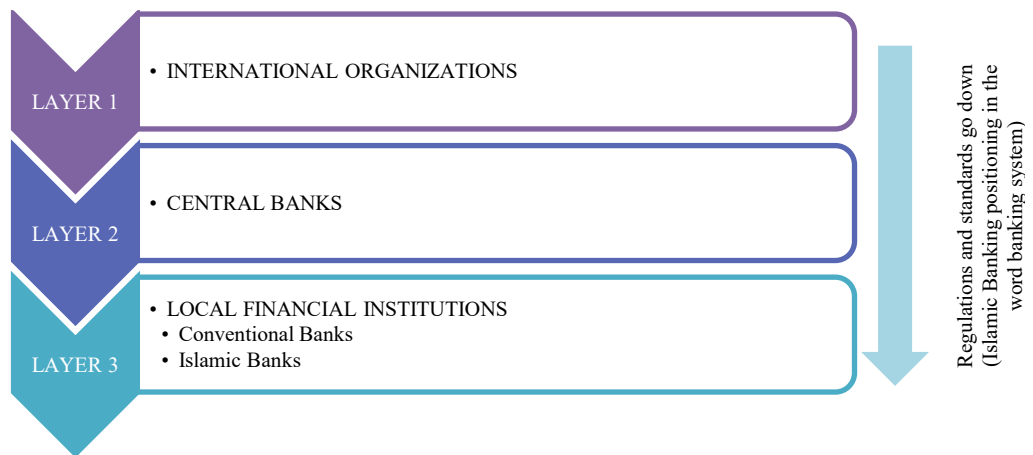


Figure 2: The connection of Layer 1, Layer 2 and Layer 3 in the context of financial institutions.

Based on Figure 2, Islamic banking is positioned on an equal footing with conventional banking within the broader financial system. The key distinction lies in the additional *Shariah* requirements and supervision imposed by the central bank or monetary authority to ensure that Islamic financial products and related activities comply with *Shariah* principles. Consequently, Islamic banking is subject to regulatory requirements that extend beyond those applicable to conventional banking (Yaacob, 2024). An effective regulatory system is essential for managing the flow of regulations and their impacts, while also shaping regulatory behaviour and policymaking. Regulatory activities should be transparent, accountable, proportionate, and consistent, with intervention limited to areas where regulatory action is necessary. This approach is generally supported by

clearly defined legal mandates governing regulatory authorities.

According to the IMF, regulatory responsibilities may be distributed among different authorities, with specific arrangements varying across countries. Typically, the central bank or Ministry of Finance oversees the primary market and its dealers, while the securities regulatory authority is responsible for regulating intermediaries in the secondary market. Effective regulation therefore requires comprehensive coverage and coordination among the relevant authorities. Harmonisation and coordination help minimise regulatory gaps and reduce the risk of inconsistent treatment of market participants engaged in similar activities, which may otherwise result in regulatory arbitrage and market distortions. Effective regulation of the secondary market should include: (i) oversight of market intermediaries; (ii) regulation of market conduct, including trading rules and market surveillance; and (iii) transparency requirements appropriate to the structure of the market.

Islamic finance operates within a comprehensive regulatory framework similar to that of the conventional financial industry, but its distinctive feature is the additional layer of *Shariah* governance. *Shariah* rulings and decisions issued by internal bodies, such as *Shariah* Committees or advisers, are incorporated into institutional policies and are subject to *Shariah* review and audit. Accordingly, the Islamic finance regulatory framework encompasses requirements relating to market conduct and compliance with both legal and *Shariah* standards. These requirements may derive from international standards, national legislation, central bank guidelines, *Shariah* fatwas, and resolutions issued by *Shariah* advisers or committees (Syarif, 2019; Yaacob, 2024).

In summary, the regulatory framework for Islamic finance includes:

International financial standards issued by bodies such as the Bank for International Settlements (BIS) and the Financial Action Task Force (FATF), which establish standards and compliance requirements for financial institutions.

A hierarchical regulatory structure. According to Yaacob (2018), these regulatory structures operate within a pyramid, beginning with international standard-setting bodies at the highest level and extending to central banks and financial institutions within individual jurisdictions. Central banks play a crucial role in translating and implementing these international standards within their respective jurisdictions and ensuring that local financial institutions comply with relevant regulatory requirements. One of their key objectives is to maintain financial stability through effective supervision and enforcement. Within Islamic finance, *Shariah* decisions and requirements are implemented alongside these broader regulatory standards and principles.

For example, corporate governance principles issued by international standard-setting bodies may influence governance requirements adopted by financial institutions, including the governance arrangements of *Shariah* Boards or Committees. Similarly, compliance with international standards extends to anti-money laundering and counter-terrorist financing measures established by the FATF. Figure 3 provides an overview of the hierarchical relationship between international standard-setting bodies, central banks, and local financial institutions within the regulatory framework.

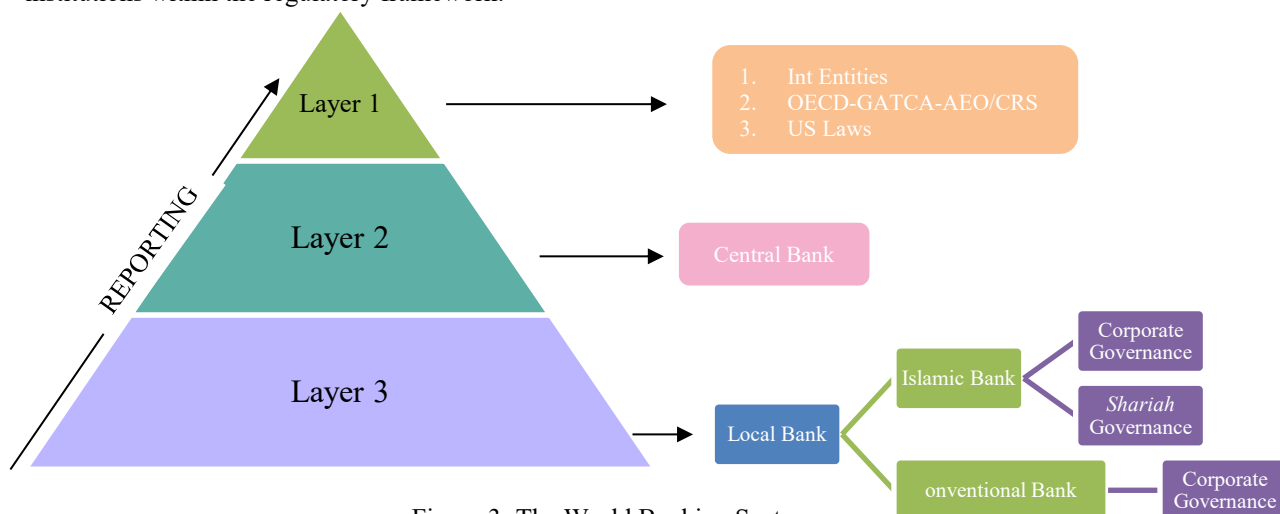


Figure 3: The World Banking System

As illustrated in Figure 3, the first layer of regulation is responsible for promoting compliance with international standards, supported by reporting and assessment mechanisms such as the Financial Sector Assessment Program (FSAP) conducted by the International Monetary Fund (IMF). The FSAP has two primary objectives: assessing the stability and soundness of the financial sector and evaluating its potential contribution to economic growth and development. In terms of financial stability, FSAP teams assess the resilience of both banking and non-banking sectors, conduct stress tests, and analyse systemic risks. This includes examining the interconnections between banks and non-bank financial institutions, as well as potential domestic and cross-border spillovers. The assessment also considers emerging risks, such as climate-related and cyber risks, and evaluates the quality of regulatory oversight, including that relating to fintech activities. Furthermore, it examines the capacity of central banks, regulatory authorities, policymakers, and financial safety nets to respond effectively to systemic stress.

From a development perspective, FSAPs evaluate financial-sector institutions, markets, and infrastructure, including legal frameworks, payment systems, and barriers to market competitiveness. They also assess progress in financial inclusion, access to digital financial services, and the contribution of the financial sector to economic growth, with particular attention to the development and deepening of domestic capital markets in developing countries. The IMF has continued to strengthen the FSAP framework by expanding its scope and coverage and improving the use of financial stability technical assistance. In February 2022, the IMF launched a new database on Financial Soundness Indicators (FSIs), which supports the monitoring and assessment of financial-sector stability. The IMF and World Bank also promote internationally recognised standards and codes across key areas through Reports on the Observance of Standards and Codes (ROSCs). These reports, prepared at the request of member countries, often accompany FSAPs and provide detailed assessments of countries' observance of relevant international standards.

Beyond these international assessment mechanisms, regulatory compliance is also supported through intergovernmental and regional agreements. For instance, the Foreign Account Tax Compliance Act (FATCA) is a United States legislative framework requiring foreign financial institutions to identify and report information concerning accounts held by US taxpayers to the Internal Revenue Service (IRS). Compliance may be facilitated through direct registration with the IRS or through intergovernmental agreements established between the United States and participating countries. At the regional level, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) contains provisions relating to financial services. In addition, the Common Reporting Standard (CRS) provides a framework for the automatic exchange of financial account information among participating jurisdictions to support international tax compliance and combat tax evasion.

At the national level, central banks and monetary authorities play an important role in translating international regulatory principles into applicable requirements and supervisory practices. In Islamic finance, this includes the formulation and implementation of *Shariah* standards and regulatory requirements to ensure compliance with Islamic principles. Jurisdictions such as Malaysia and several countries in the Middle East have established regulatory and *Shariah* governance frameworks for this purpose. Standards developed by international organisations, particularly the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) and the Islamic Financial Services Board (IFSB), serve as important benchmarks for Islamic financial institutions. Although these standards are not necessarily legally binding in all jurisdictions, they may be adopted or incorporated into national regulatory frameworks and institutional policies.

Local legislation and *Shariah* resolutions constitute another important layer of compliance. Regulations governing areas such as stamp duty, contracts, land, taxation, and financial transactions provide the legal framework within which financial institutions operate. In Islamic finance, *Shariah* resolutions issued by central bank-level or national *Shariah* authorities may also form part of the applicable regulatory framework. Where such decisions are legally binding, financial institutions are required to comply with them, and non-compliance may result in regulatory sanctions. At the institutional level, decisions issued by internal *Shariah* advisers or *Shariah* Committees provide further guidance on the *Shariah* compliance of specific products, transactions, and operations. The extent to which such decisions are legally binding, and the consequences of non-compliance, depend on the regulatory and *Shariah* governance framework of the respective jurisdiction.

Overall, the three-tiered relationship described in *The World Banking System* illustrates how international standards and regulatory principles are transmitted through central banks and other national authorities to local financial institutions. Through this hierarchical process, international standards are translated into national regulations, institutional policies, and *Shariah* requirements. Their subsequent monitoring and review promote consistency, accountability, and compliance across financial institutions, thereby contributing to the

harmonisation of regulatory practices within the global financial system.



Figure 4: Regulatory Framework of Islamic financial regulations.
Source: (Yaacob, 2022).

As illustrated in Figure 4, the regulatory framework for Islamic finance comprises a combination of hard and soft law. As noted by Chinkin (1989), the distinction between hard and soft law presents various challenges at different levels, particularly concerning the legal effects and compliance implications of soft-law instruments. This issue is particularly evident in the context of international economic law. Although soft-law instruments have limited juridical effects, member countries may nevertheless be expected to comply with the standards and principles established under relevant international compliance regimes.

5.1 Islamic Finance Regulatory Framework in Brunei Darussalam

The regulatory framework for Islamic finance in Negara Brunei Darussalam encompasses various aspects of the banking and financial sectors. Brunei Darussalam operates a dual banking system that permits both Islamic and conventional banking, thereby providing customers with a wider range of financial products and services. Regulatory authorities have undertaken initiatives to enhance public understanding of Islamic finance, while leading institutions such as Bank Islam Brunei Darussalam (BIBD) have contributed to the development of Islamic financial products and practices. The operations and activities of the Islamic finance sector are regulated by the Brunei Darussalam Central Bank (BDCB) under the provisions of the Brunei Darussalam Central Bank Order 2010.

5.1.1 Dual Banking System

Brunei Darussalam operates a dual banking system that accommodates both conventional and Islamic banking. This structure provides customers with a broader range of financial products and services while allowing Islamic financial institutions to offer competitive, *Shariah*-compliant alternatives. The competitive environment created by this dual system has encouraged financial institutions to respond to changing customer needs through the development of new products and services. These include various forms of financing, deposit products, insurance-related services such as *takaful*, and other banking facilities. Within the Islamic banking

sector, these products are structured to meet the financial needs of Muslim customers while adhering to *Shariah* principles, including the preservation and purification of wealth (mal).

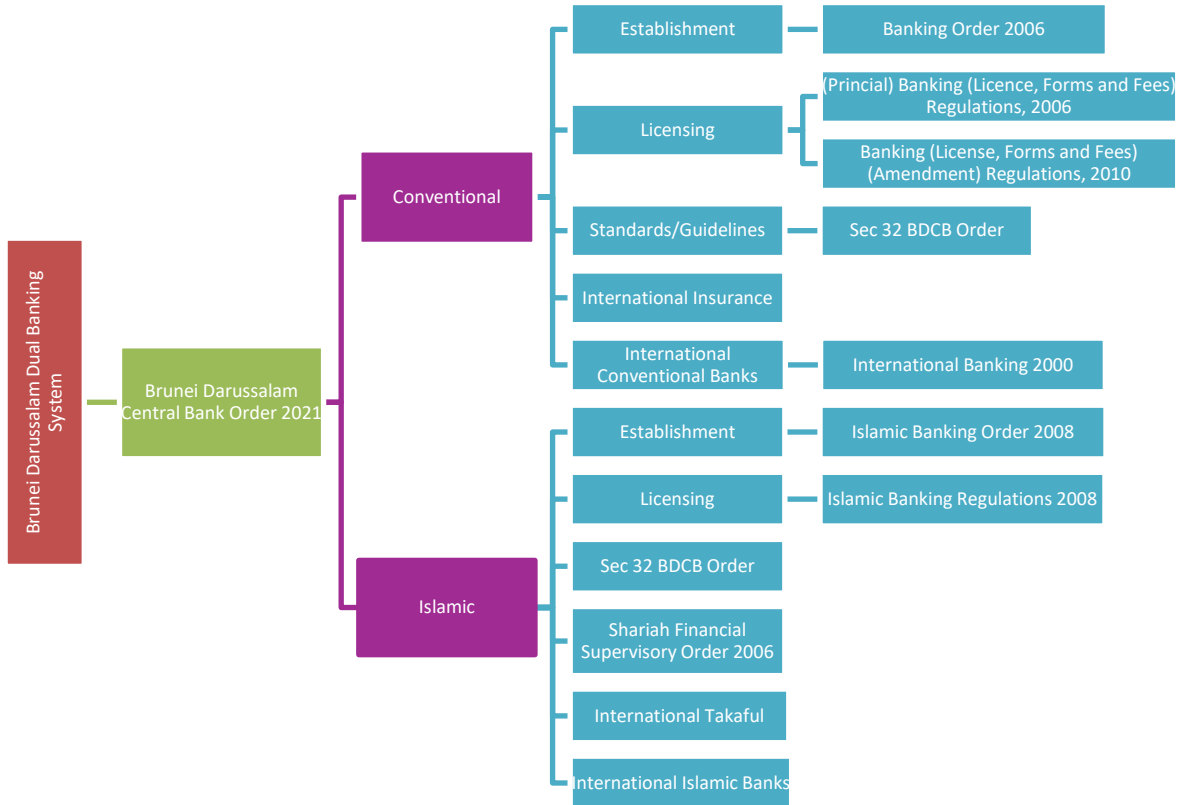


Figure 5: Brunei Darussalam Dual Banking Framework.

As illustrated in Figure 5, Brunei Darussalam operates a dual banking system comprising both conventional and Islamic banking. Conventional banking is regulated under the Banking Order 2006, with the licensing process and related statutory requirements stipulated in the Banking (Licence Forms and Fees) (Amendment) Regulations 2010.

A significant institutional transition occurred on 26 June 2021, when the Autoriti Monetari Brunei Darussalam Order 2010 (AMBD Order 2010) was amended and superseded by the Brunei Darussalam Central Bank Order (Amendment) 2021. Following this transition, the provisions of the AMBD Order 2010, hereafter referred to as the Principal Order, remain applicable except for those that were amended or newly inserted under the 2021 legislation. Under the current regulatory framework, both Islamic and conventional banks are regulated by the Brunei Darussalam Central Bank (BDCB) under the applicable provisions of the BDCB Order. Section 32 of the Principal Order further grants the Central Bank the authority to issue guidelines, circulars, or notices in relation to specific provisions of the Order or the conduct of banks and financial institutions. Islamic banking is specifically regulated under the Islamic Banking Order (IBO) 2008, which replaced the earlier Islamic Banking Act 1992 (Cap. 168).

5.1.2 Regulators in the Financial Industry

The regulatory authorities responsible for overseeing the financial industry and related activities in Brunei Darussalam are outlined in Figure 6.

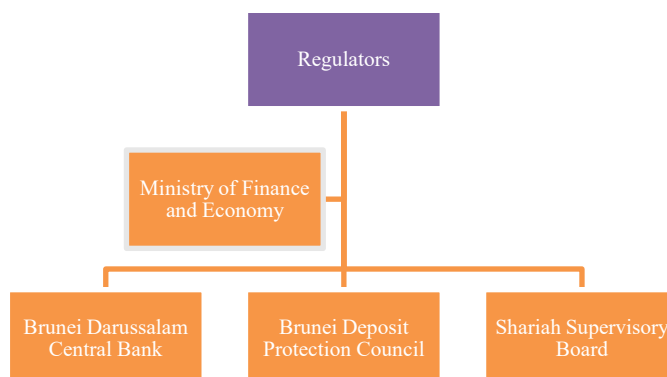


Figure 6: Regulators of Brunei Darussalam's financial industry.

Figure 6 illustrates the regulatory authorities responsible for the financial industry in Brunei Darussalam. In terms of governance, the Islamic finance industry and the broader financial sector are currently overseen by the Ministry of Finance and Economy (MOFE). The relevant regulatory authorities are accountable to the MOFE in carrying out their respective regulatory and supervisory responsibilities. The regulatory landscape in Brunei Darussalam is illustrated in Figure 7.

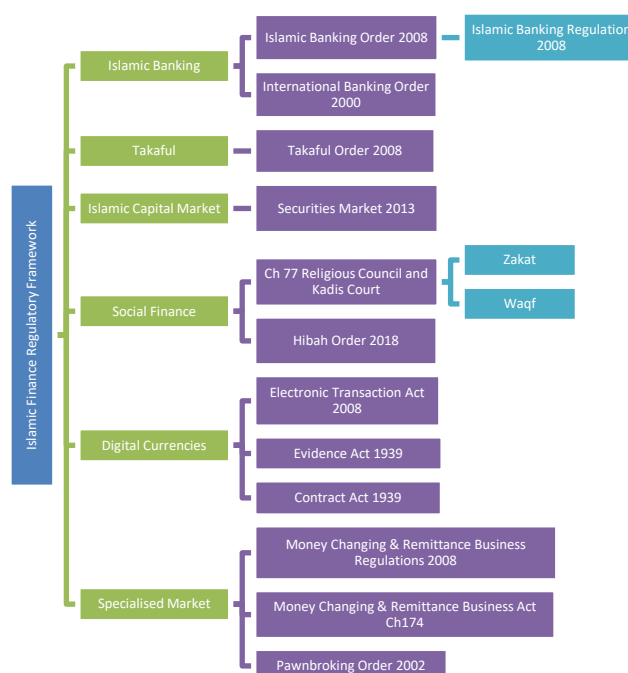


Figure 7: Regulatory Framework of Islamic Finance in Negara Brunei Darussalam.

Any party intending to establish an Islamic bank in Negara Brunei Darussalam is required to complete the application form prescribed in the First Schedule to the Islamic Banking (Miscellaneous Provisions) Regulations 2008. Pursuant to Section 7 of the Islamic Banking Order (IBO) 2008, an incorporated entity intending to conduct Islamic banking business must submit the application form together with its Memorandum of Association (MOA) and other required financial statements or supporting documents. Section 8 of the IBO 2008 sets out the criteria for approval and the granting of an Islamic banking licence.

The central monetary authority of Brunei Darussalam was established in 2010 under the Autoriti Monetari Brunei Darussalam Order 2010 (AMBD Order 2010). The principal objectives of the Central Bank include achieving and maintaining domestic price stability; ensuring the stability of the financial system, particularly through the formulation of financial regulations and prudential standards; supporting the establishment and

efficient operation of payment systems; and fostering the development of a sound and progressive financial services sector. In addition to these objectives, the Central Bank is responsible for supporting the general economic policies of the Government to the extent that it considers appropriate.

Under the prevailing regulatory framework, the Central Bank is responsible for regulating and supervising financial institutions, including those operating in the Islamic finance sector. In this capacity, the BDCB has the authority to issue guidelines pursuant to Section 32 of the BDCB Order. In relation to international obligations, Section 33(1) provides for the issuance of directions or regulations to facilitate the discharge of the Government's international obligations. The BDCB is also authorised to inspect financial institutions to assess compliance with applicable directions and regulations, including those relating to international obligations issued by the United Nations Security Council under Section 33 and anti-money laundering requirements under Section 34.

Pursuant to Section 3 of the Syariah Financial Supervisory Board (SFSB) Order 2006, the SFSB was established as the authority responsible for the ascertainment of Islamic law (*Hukum Syara'*) in relation to Islamic banking business, *takaful* business, Islamic financial business, Islamic development financial business, and any other business based on *Shariah* principles that is supervised and regulated by the Authority. As specified under Section 2 of the Order, the term "Authority" refers to the Minister of Finance, under whose purview the SFSB operates. Under Section 4 of the SFSB Order 2006, the functions of the Board include:

- (a) performing such functions as may be determined by the Authority; and
- (b) serving as a reference body for financial institutions seeking guidance on *Shariah* matters relating to Islamic banking business, *takaful* business, Islamic financial business, Islamic development financial business, and any other business based on *Shariah* principles.

In carrying out these functions, the SFSB is empowered under Section 5 to issue written directives. Commonly referred to as *Shariah* resolutions, these directives address matters including the endorsement of Islamic financial products and promote consistency in the interpretation and application of *Hukum Syara'* across the financial sector. This centralised governance framework is important for mitigating *Shariah* non-compliance risks, reducing interpretative divergence among Islamic financial institutions, and strengthening public confidence in the *Shariah* compliance and legitimacy of Islamic financial products and operations.

5.2 Dispute Resolution

At present, legal disputes relating to Islamic finance in Brunei Darussalam are generally heard by the civil courts. The jurisdiction of the *Syariah* Courts over Islamic finance disputes is limited under the Religious Council and Kadis Courts Act (Cap. 77) and the *Syariah* Courts Act (Cap. 184), together with specific provisions relating to *hibah* and *rahn*. Certain matters, particularly those relating to *hibah* and *rahn* within the area of Islamic social finance, may fall within the jurisdiction of the *Syariah* Courts. However, the existing legal framework does not provide clear procedural guidance on how such matters should be handled by the *Syariah* Courts.

6. Conclusion

In summary, the financial system—whether Islamic or conventional—operates within a regulatory framework based on a layered and hierarchical structure. Brunei Darussalam maintains a dual banking and regulatory system that accommodates both Islamic and conventional finance. Within this framework, Islamic financial institutions are subject to the same broader regulatory requirements as their conventional counterparts, together with additional *Shariah* governance and compliance requirements. Relevant *Shariah* authorities provide guidance and resolutions on matters of *Shariah* compliance, while the Brunei Darussalam Central Bank (BDCB), the Ministry of Finance and Economy (MOFE) and *Syariah* Financial Supervisory Board (SFSB) play important roles in regulating and overseeing the financial sector. The regulation of Islamic financial institutions is therefore based on both statutory legal requirements and *Shariah* principles. An enabling legal and regulatory framework is important for the continued development, competitiveness, and integration of Islamic finance into the global financial system. Such a framework should ensure the legal recognition and enforceability of Islamic contracts within the domestic legal system, support compliance with *Shariah* principles and rulings, promote financial inclusion, and protect the interests of financial consumers. These elements are important for strengthening confidence in Islamic financial services and supporting the sustainable development of the sector.

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