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Determinants of Islamic Banking Asset Growth: Financial Performance and Digital Transactions

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Abstract

This study examines the associations between digital transaction indicators, financial performance, and Islamic banking asset growth in Indonesia, Saudi Arabia, and Malaysia during 2018–2024. Despite rapid digitalisation, Islamic banking asset growth remains unequal across countries, while few studies examine digital transaction indicators alongside financial performance in this context. This study employs country-specific panel data regression using 224 bank-year observations from 32 Islamic commercial banks. Financial performance is measured by return on assets (ROA), return on equity (ROE), capital adequacy ratio (CAR), and cost-to-income ratio. At the same time, digital transaction value, average transaction value per user and the number of mobile transaction users represent country-year contextual indicators of the digital transaction environment. The results show different associations across countries. In Indonesia, digital transaction value is positively associated with asset growth, whereas average transaction value per user, and the number of mobile transaction users are negatively associated. In Saudi Arabia, ROE is positively associated with asset growth, while in Malaysia, CAR is negatively associated with it; the other variables show no significant associations. The findings represent selected associations rather than a comprehensive explanation of asset growth and provide partial empirical evidence relevant to the Theory of Firm Growth. The study is limited by its use of country-year rather than bank-specific digital indicators, limited country and period coverage, the absence of several relevant control variables, and an observational design that limits causal inference.

Keywords : Islamic banking; asset growth; digital transactions; financial performance; panel data regression.

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INTRODUCTION

Islamic banking remains central to the global Islamic financial services industry (IFSI). Total IFSI assets reached USD 3.88 trillion in 2024, up 14.9% year on year increase, and Islamic banking assets grew 17.05% in the same year (IFSB, 2025); industry reports also describe sustained expansion in Islamic finance over the past decade (ICD & LSEG, 2024). However, this expansion is markedly uneven. Islamic banking holds 75.3% of domestic banking assets in Saudi Arabia and 33.2% in Malaysia, but only 7.3% in Indonesia (IFSB, 2025), even though Indonesia had the world's largest Muslim population, estimated at 239 million in 2020 (Hackett, 2025).

Over the same period, payments have shifted rapidly towards digital channels (Demirgüç-Kunt et al., 2022). In Saudi Arabia, electronic payments accounted for 79% of retail payments in 2024, up from 70% in 2023 (SAMA, 2025). Bank Negara Malaysia granted five digital bank licences in 2022, two of them under the Islamic Financial Services Act 2013 (BNM, 2022), following the Fintech Booster Programme (BNM, 2020), while Indonesia has digitalised retail payments through the national QR standard (QRIS) and its payment system blueprint (BI, 2020; BI, 2025). Digitalisation lowers transaction costs and allows services to be unbundled, but it also reinforces economies of scale, scope, and network effects that may favour either incumbents or technology-based entrants (Feyen et al., 2021). For Islamic banks, digital channels are therefore both an opportunity to reach customers and a source of competitive pressure (Abdul Rahman et al., 2023; Muin et al., 2025).

Figure 1 shows that Indonesia records the largest digital transaction value of the three countries over 2018–2024. Yet, its Islamic banking sector has by far the smallest domestic market share, whereas Saudi Arabia, with a smaller digital payment market, hosts the most dominant Islamic banking sector (IFSB, 2025; Statista, 2025). A large digital transaction market, in other words, does not automatically translate into Islamic banking expansion. The research problem is therefore whether variation in a country's digital transaction environment is associated with growth in its Islamic banking sector, once banks' financial performance is taken into account.

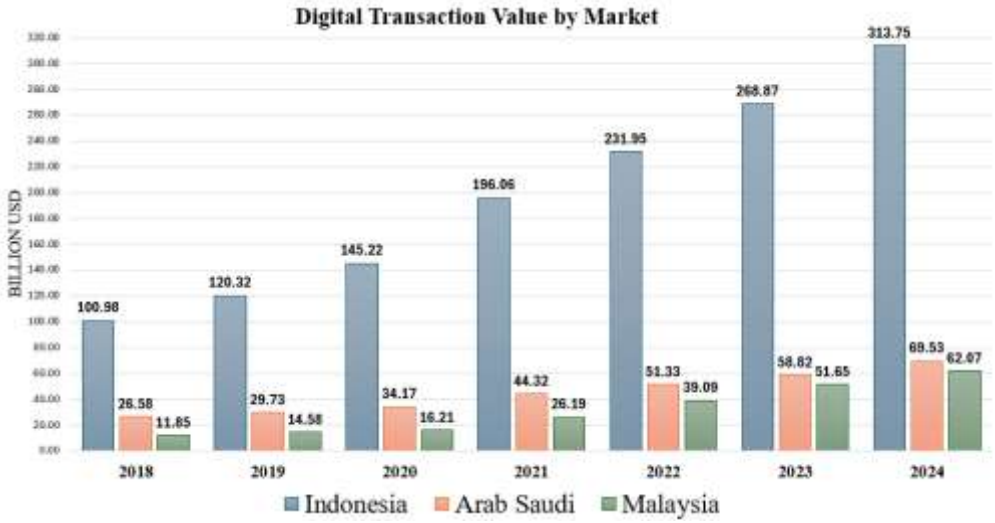

Figure 1: Digital Transaction Value by Market (Source: Statista, 2025)

Existing evidence on both sets of factors is inconsistent. CAR, ROA, and ROE are significantly related to total Islamic banking assets in five countries (Mahendra & Musthofa, 2023). Still, CAR shows no significant effect on Islamic banking asset growth in Indonesia (Kristianingsih et al., 2022). Higher bank equity is associated with faster loan growth (Gambacorta & Shin, 2018), yet tighter capital requirements lead regulated banks to reduce lending (Aiyar et al., 2012), and Islamic banks are less cost-effective but better capitalised than conventional banks (Beck et al., 2013). Studies of digitalisation focus mainly on profitability and diverge in their findings: internet banking is positively associated with the profitability of Saudi banks (Sayari, 2024) and mobile banking with the ROA of listed Indonesian Islamic banks (Anindyastri et al., 2022), whereas digital transformation is negatively associated with bank profitability in Vietnam (Nguyen-Thi-Huong et al., 2023), fintech growth negatively predicts bank performance in Indonesia (Phan et al., 2020), and digitisation shows only modest associations with performance among GCC banks (Alzoubi et al., 2026). Mobile banking may also make deposits less stable (Koont et al., 2024). Because these strands are usually examined separately and rarely use asset growth as the outcome, it remains unclear whether digital transaction activity is associated with Islamic banking asset growth when financial performance is considered simultaneously; this is the empirical gap.

The methodological and contextual gap concerns the level of analysis and the period studied. Evidence on digitalisation and bank outcomes comes mainly from bank-level, single-country samples (Nguyen-Thi-Huong et al., 2023; Phan et al., 2020; Sayari, 2024), whereas digital payment indicators are generally available only at the market level (Statista, 2025). Combining the two assigns the same digital value to every bank in a country-year and cannot separate digital effects from other country-wide shocks. Cross-country evidence on Islamic banking expansion, which links it to income per capita, the Muslim population share, economic integration with Middle Eastern countries, and interest rates, relies on data from 1992–2006, before the digital payment era (Imam & Kpodar, 2013).

The research gap is therefore not the absence of particular variables, but the lack of a theoretically motivated assessment of whether the digital transaction environment and bank financial performance are jointly associated with Islamic banking asset growth. The study's novelty is specific and modest: it explicitly distinguishes bank-level financial ratios from country-year digital indicators; it decomposes the digital transaction environment into scale (market-based transaction value), intensity (average transaction value per user) and breadth (number of mobile transaction users); and it interprets these dimensions through Penrose's opportunity–resource logic, which provides an explicit, though not directly tested, mechanism.

Indonesia, Saudi Arabia, and Malaysia are selected purposively on three criteria. First, they represent contrasting positions of Islamic banking in the domestic banking system: dominant, established, and small, respectively (IFSB, 2025), and Indonesia's low penetration despite its large Muslim population contrasts with cross-country evidence linking Islamic banking development to the Muslim population share (Imam & Kpodar, 2013). Second, all three are leading Islamic fintech ecosystems: the Global Islamic Fintech Index 2024/25 ranks Saudi Arabia first, with Malaysia and Indonesia in the top five (DinarStandard & Elipses, 2024). Third, their digital payment policies follow different routes: a cashless agenda under Saudi Vision 2030 (SAMA, 2025; Saudi Vision 2030, 2025), licensing of Islamic digital banks in Malaysia (BNM, 2022), and payment infrastructure centred on QRIS in Indonesia (BI, 2020). Because the selection is purposive

and limited to three countries, the findings are not intended to generalise to all Islamic banking jurisdictions.

Accordingly, this study examines how the digital transaction environment (market-based digital transaction value, average transaction value per user, and number of mobile transaction users) and bank financial performance (ROA, ROE, CAR, and CIR) are associated with Islamic banking asset growth in Indonesia, Saudi Arabia, and Malaysia over 2018–2024, using bank-year observations in which the digital indicators serve as country-year contextual variables. Given the observational design and the small number of countries, the study tests theoretically derived associations and does not claim causal identification. It contributes cross-country evidence showing that these associations differ across countries: digital transaction indicators are associated with asset growth in Indonesia, ROE in Saudi Arabia, and CAR in Malaysia. It also offers an illustrative application of Penrose's growth theory, rather than a formal test or extension, and practical insights for regulators and Islamic banks on the importance of considering the digital transaction environment and banks' financial positions together within each country's context. The remainder of the article presents the literature review, method, results, discussion, and conclusion.

LITERATUR REVIEW

The Theory of the Growth of the Firm

This study adopts Penrose's Theory of the Growth of the Firm as its grand theory (Penrose, 1959). Penrose conceives of the firm as a bundle of productive resources coordinated by management and explains growth as a process driven by the services these resources can render, rather than as movement towards an optimal size (Di Petta et al., 2018; Pitelis, 2009). Three propositions are relevant. First, resources are rarely used to full capacity: indivisibilities and learning continually create unused productive services, or excess resources, which give firms an internal inducement to expand. Second, growth occurs when management perceives and acts upon productive opportunities, which are jointly shaped by the firm's resources and by external conditions such as demand, technology and institutions. Third, the rate of growth is limited

by the managerial capacity required to plan and integrate new activities, a constraint later termed the Penrose effect (Penrose, 1959; Pitelis, 2009).

Subsequent resource-based research has refined these propositions. A meta-analysis shows that versatile resources, that is, those that can be redeployed and recombined, are associated with higher firm growth. In contrast, resources defined only as valuable, rare, inimitable, and non-substitutable are not (Nason & Wiklund, 2018). Integrating Penrose's theory with the resource-based view, Burvill et al. (2018) identify critical resources and the cyclical processes through which they enable growth. The implication for this study is that growth should be explained by the interaction between the opportunities available in the environment and the resources available to exploit them, rather than by either set of factors in isolation.

Applying Penrose to Islamic Banking Asset Growth

Because Penrose's theory is formulated for individual firms, two scope conditions apply. Asset growth and financial ratios are measured from the sample banks' financial statements and reflect their growth and internal resource position. The digital transaction indicators, in contrast, describe the national digital payment market, which includes non-bank channels; they are therefore interpreted as part of the external productive opportunity faced by all Islamic banks in a country, not as a capability of any individual bank. Consequently, the results cannot show which banks exploit digital opportunities and should not be used to draw inferences about individual banks.

Within these conditions, the theory implies a five-step mechanism. (1) As payments migrate to digital channels, the digital transaction environment expands the set of customer interactions that connected banks can reach at low marginal cost (Feyen et al., 2021). (2) Digital channels allow banks to use existing organisational resources and capabilities (customer relationships, Sharia-compliant products, payment processing, and risk assessment routines) more fully, turning unused productive services into a basis for expansion (Nason & Wiklund, 2018; Penrose, 1959). (3) This utilisation appears as greater transaction activity and customer access; payment platforms exhibit network effects (Rysman, 2009), and payment flows generate information that supports financing

decisions (Ghosh et al., 2021; Parlour et al., 2022). (4) Higher transaction activity can increase funding and financing origination, while retained profits and capital provide the internal finance and loss-absorbing capacity needed for business expansion (Gambacorta & Shin, 2018). (5) Expansion in financing and funding is reflected in Islamic banking asset growth.

Three conditions may weaken or reverse this mechanism. When digital payments are captured mainly by non-bank platforms, the funds and information they generate may bypass banks (Feyen et al., 2021; Parlour et al., 2022), consistent with the negative relationship between fintech growth and bank performance in Indonesia (Phan et al., 2020). Digital access can also make deposits more mobile and less reliable as a basis for growth (Koont et al., 2024). Finally, consistent with the Penrose effect, digital investment absorbs managerial and financial resources, so its benefits may follow an investment phase (Alzoubi et al., 2026). The theory therefore predicts a positive association where Islamic banks capture digital transaction activity, but a weak or negative one where capture is limited. The empirical model estimates only direct associations; it does not test the intermediate steps, including any mediating role of financial performance.

Islamic Banking Asset Growth

Islamic banking asset growth is defined as the annual percentage change in the combined total assets of the sample Islamic commercial banks in each country, measured in local currency and obtained from the banks' annual reports. It reflects the expansion of intermediation, the financing portfolio, and the funding that supports it, which is particularly relevant for Islamic banks, whose intermediation ratios exceed those of conventional banks (Beck et al., 2013). Asset growth therefore captures how far Islamic banks convert available opportunities and resources into a larger balance sheet, which is the outcome predicted by Penrose's framework. Previous studies have also used total asset growth to analyse Islamic banking development (Kristianingsih et al., 2022; Mahendra & Musthofa, 2023).

Digital Transaction Environment and Hypotheses

Market-Based Digital Transaction Value

Market-based digital transaction value is the total value of transactions conducted through digital payment channels, such as mobile and online banking, e-wallets, QR payments, and electronic transfers, in a country in a given year (Statista, 2025). It captures the scale of the digital transaction environment. A larger digital transaction market enlarges the productive opportunity available to banks, as more economic activity passes through channels that can be linked to bank accounts and generates funds, fee income, and payment information (Ghosh et al., 2021; Parlour et al., 2022). Internet banking is positively associated with the profitability of Saudi banks, including Islamic banks (Sayari, 2024); digital financial services are associated with greater efficiency and lower transaction costs in Islamic financial institutions (Muin et al., 2025); and digitalisation improves firm performance by reducing external management costs and strengthening internal controls (Gao et al., 2023). The evidence is nevertheless inconsistent: digital transformation is negatively associated with bank profitability in Vietnam (Nguyen-Thi-Huong et al., 2023), digitisation has only modest associations with the performance of GCC banks (Alzoubi et al., 2026), and because market-level transaction value includes non-bank channels, part of its growth may be captured by fintech platforms rather than banks (Feyen et al., 2021; Phan et al., 2020). Following the opportunity-based argument:

H1: Market-based digital transaction value is positively associated with Islamic banking asset growth.

Average Transaction Value per User

Average transaction value per user is the average annual value of digital payment transactions per user in a country (Statista, 2025). It measures the intensity of digital payment use (how much economic activity each user channels through digital means), not how often users transact. A higher value per user indicates that digital channels handle a larger share of households' and firms' payments, deepening customer relationships, increasing balances held in transaction accounts, and enriching the payment information available for financing decisions

(Ghosh et al., 2021). The direction, however, remains theoretically ambiguous. When adoption spreads through small-value retail payments such as QR transactions, the number of users may rise faster than transaction value, so value per user may fall even as digital engagement increases; high value per user may also reflect concentration among a few high-value users. Within the literature reviewed, no peer-reviewed study was found that directly tests the relationship between transaction value per user and Islamic banking growth. Following the opportunity-based argument:

H2: Average transaction value per user is positively associated with Islamic banking asset growth.

Number of Mobile Transaction Users

The number of mobile transaction users is the number of individuals in a country who use mobile devices to make digital payments in a given year (Statista, 2025). It captures the breadth of the digital transaction environment. A larger user base expands the customer segment that banks can reach without physical branches, and because payment systems are two-sided markets, growth in users encourages merchant adoption and further transaction activity (Rysman, 2009). Policymakers explicitly expect digital banking to advance financial inclusion by lowering transaction costs and overcoming geographical barriers (BNM, 2022), and global survey data document the growing role of digital payments in account use (Demirgüç-Kunt et al., 2022); evidence from Ghana further shows that trust in mobile money providers sustains continued use of mobile financial services (Shaikh et al., 2023). Among listed Indonesian Islamic banks, mobile banking is positively related to ROA (Anindyastri et al., 2022). However, broader digital access can intensify competition from fintech providers (Phan et al., 2020) and make deposits more sensitive to interest rate changes (Koont et al., 2024). On balance:

H3: The number of mobile transaction users is positively associated with Islamic banking asset growth.

Financial Performance and Hypotheses

Return on Assets

ROA is the ratio of net income to total assets and measures how productively a bank's assets generate profit. In Penrose's framework, profitability is both an outcome of effective resource use and a source of internal finance for further growth, as retained profits enlarge the resources available for expansion (Penrose, 1959). ROA is significantly related to total Islamic banking assets across five countries (Mahendra & Musthofa, 2023), and the Islamic banking model contributes positively to Islamic banks' ROA in dual banking economies where Islamic financial development is stronger (Ahsan & Qureshi, 2022). Profits may, however, be distributed or held as reserves rather than used for expansion, which would weaken the association. Hence:

H4: ROA is positively associated with Islamic banking asset growth.

Return on Equity

ROE is the ratio of net income to shareholders' equity and indicates a bank's capacity to generate capital internally, since retained returns on equity increase the capital base that supports further financing. ROE has a positive and significant effect on total Islamic banking assets (Mahendra & Musthofa, 2023), and the Islamic banking model is associated with higher ROE among both Islamic and conventional banks (Ahsan & Qureshi, 2022). ROE should nonetheless be interpreted cautiously, because a high ROE may reflect a thin equity base rather than superior performance and may therefore coincide with limited capacity to grow. Hence:

H5: ROE is positively associated with Islamic banking asset growth.

Capital Adequacy Ratio

CAR is the ratio of regulatory capital to risk-weighted assets and measures a bank's capacity to absorb losses from financing and operational risks. In Penrosean terms, capital is a financial resource that determines how much additional financing risk banks can assume when exploiting new opportunities. Across countries, a one percentage point increase in banks' equity-to-assets ratio is associated with a 0.6 percentage point increase in annual loan growth (Gambacorta & Shin, 2018), CAR is

positively related to total Islamic banking assets (Mahendra & Musthofa, 2023), and Islamic banks are on average better capitalised than conventional banks (Beck et al., 2013). Conversely, tighter capital requirements lead regulated banks to reduce lending (Aiyar et al., 2012), and CAR shows no significant effect on Islamic banking asset growth in Indonesia (Kristianingsih et al., 2022). Because a high CAR may reflect either expansion capacity or regulatory and managerial conservatism, the hypothesis rests on the resource-capacity argument:

H6: CAR is positively associated with Islamic banking asset growth.

Cost-to-Income Ratio

CIR is the ratio of operating expenses to operating income; a lower CIR indicates that fewer resources are consumed to generate each unit of income. Efficiency releases financial and managerial resources that can be redeployed to expansion, whereas a high CIR absorbs income that could otherwise finance growth. Islamic banks are less cost-effective than conventional banks (Beck et al., 2013), so efficiency may constrain their growth; among GCC banks, greater digitisation is associated with better efficiency ratios (Alzoubi et al., 2026). In the short term, however, expansion through digital investment can raise operating costs, as digitisation costs may outweigh immediate benefits during an investment phase (Alzoubi et al., 2026). Hence:

H7: CIR is negatively associated with Islamic banking asset growth.

Figure 2 presents the conceptual framework. Solid arrows denote the hypothesised associations tested in this study; the dashed path denotes the Penrosean mechanism that motivates the hypotheses but is not directly tested.

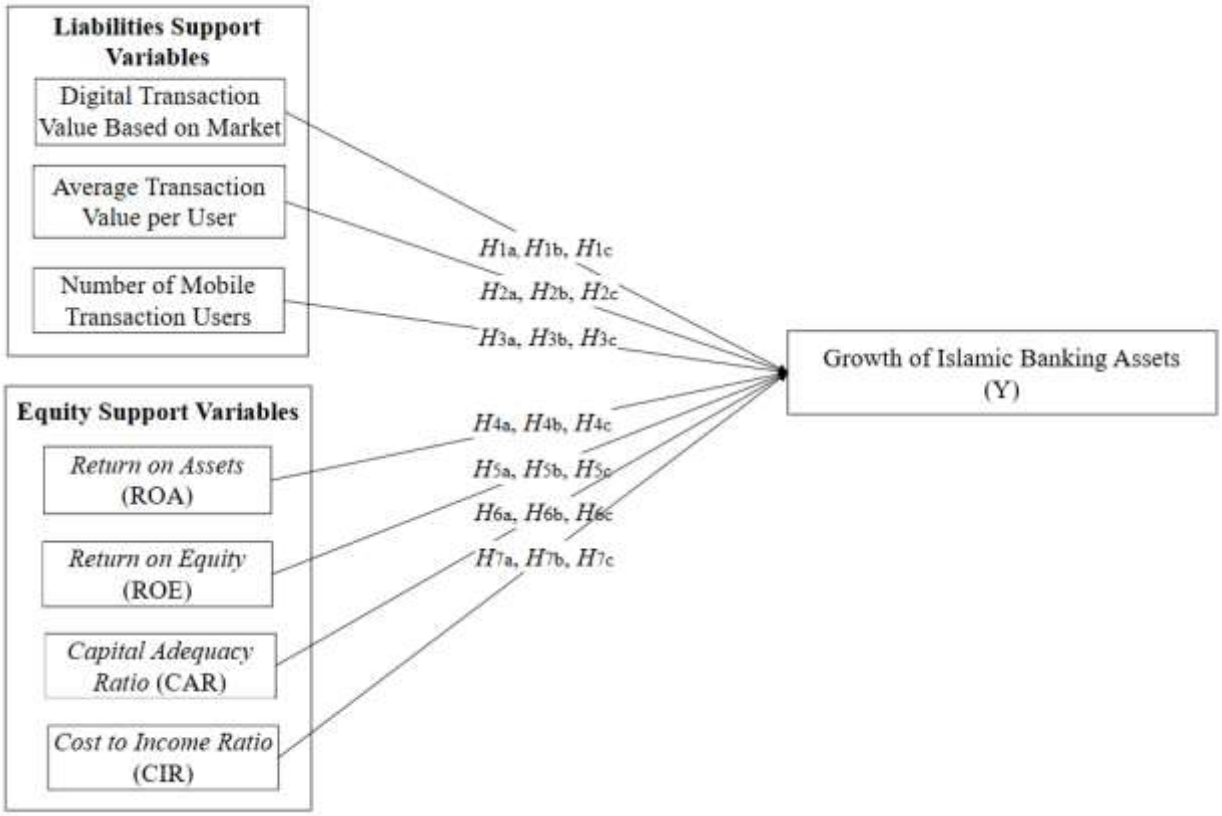

Figure 2: Research Model

RESEARCH METHOD

This study uses a quantitative explanatory approach with panel data on Islamic commercial banks in Indonesia, Saudi Arabia, and Malaysia for 2018–2024. Using purposive sampling, 10 banks in Indonesia, 10 banks in Saudi Arabia, and 12 banks in Malaysia were selected based on consistent operation and the availability of complete annual financial statements, resulting in 70, 70, and 84 bank-year observations, respectively. Bank-level financial data were obtained from annual reports and financial statements, while digital transaction data were obtained from the Statista Market Insights Digital Payments database.

The dataset combines bank-level financial variables and country-year contextual indicators. ROA, ROE, CAR, and CIR are obtained from individual banks' financial statements. In contrast, NTP, NRP, and JPM represent the digital transaction environment at the country-year level rather than individual bank characteristics. Therefore, the same country-year value of these indicators is assigned to banks operating in the same

country and year. These indicators vary across countries and years but not across banks within the same country-year. Accordingly, the analysis examines the relationship between country-level digital transaction conditions and Islamic banking asset growth rather than the effect of individual-bank digital transactions. The Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) are compared, with model selection based on the Chow, Hausman, and Lagrange Multiplier tests. The analysis includes descriptive statistics, classical assumption tests, coefficient of determination (R^2), t-tests, and F-tests. Because the study is observational, the estimated coefficients are interpreted as associations rather than causal effects.

RESULTS AND DISCUSSION

Results

This section reports the estimation results for the three country models. The dependent variable is Islamic banking asset growth (APS). The independent variables are the country-year digital transaction indicators (NTP, NRP, and JPM) and the financial performance ratios ROA, ROE, CAR, and CIR.

Descriptive Statistics

Tables 1–3 present the descriptive statistics. The Indonesian model comprises 70 observations from 10 Islamic commercial banks, with a mean APS of 0.0871 and a standard deviation of 0.2114, the widest dispersion among the three countries. The Saudi Arabian model comprises 70 observations from 10 banks and records the highest mean APS (0.1209) with a standard deviation of 0.0994. The Malaysian model comprises 84 observations from 12 banks, with a mean APS of 0.0607 and a standard deviation of 0.0708. Because NTP, NRP, and JPM are country-year contextual indicators, their values are identical for all banks in the same country and year; their dispersion in each table therefore reflects variation across the seven years rather than differences between banks.

Table 1. Descriptive Statistics of Indonesian Islamic Commercial Banks (2018–2024)

Variable	Obs	Mean	Std. dev.	Min	Max
APS	70	0.0871	0.2114	-0.2540	1.1670
NTP	70	2.2614	0.1722	2.0040	2.4970
NRP	70	1.1242	0.1878	0.8100	1.3300
JPM	70	2.2174	0.0995	2.0940	2.3740
ROA	70	1.7250	3.3444	-7.1300	13.580
ROE	70	0.7221	1.2055	-4.6100	3.1200
CAR	70	1.3965	0.1541	1.0910	1.7650
CIR	70	1.8345	0.1429	1.5070	2.3070

(Source: Processed data using EViews 13, 2026)

Table 2. Descriptive Statistics of Saudi Arabian Islamic Commercial Banks (2018–2024)

Variable	Obs	Mean	Std. dev.	Min	Max
APS	70	0.1209	0.0994	-0.7000	0.5240
NTP	70	1.6287	0.1460	1.4250	1.8420
NRP	70	2.8800	0.4144	2.2300	3.4900
JPM	70	1.1737	0.0841	1.0760	1.3000
ROA	70	1.4211	0.8608	-1.5000	2.7600
ROE	70	1.0500	0.6645	-0.9900	2.3870
CAR	70	1.3031	0.0516	1.1630	1.4700
CIR	70	1.6011	0.1255	1.3960	1.9240

(Source: Processed data using EViews 13, 2026)

Table 3. Descriptive Statistics of Malaysian Islamic Commercial Banks (2018–2024)

Variable	Obs	Mean	Std. dev.	Min	Max
APS	84	0.0607	0.0708	-0.1230	0.1870
NTP	84	1.4234	0.2644	1.0740	1.7930
NRP	84	2.1100	0.7207	1.3800	3.2300
JPM	84	1.1240	0.1206	0.9350	1.2830
ROA	84	1.0164	0.5367	-2.1900	1.9000
ROE	84	0.8583	0.4194	-2.0200	1.3900
CAR	84	1.2758	0.0670	1.1850	1.4640
CIR	84	1.6392	0.0874	1.3870	1.8100

(Source: Processed data using EViews 13, 2026)

Panel Data Regression Model Selection

Table 4 reports the model selection tests. For Indonesia, the Chow test favours FEM over the CEM, the Hausman test favours REM over FEM, and the Lagrange Multiplier test favours REM over CEM; therefore, the REM is selected. For Saudi Arabia and Malaysia, the Chow and Lagrange Multiplier tests yield probability values above 0.05, so the CEM is selected for both countries.

Table 4. Panel Data Model Selection Results

Country	Chow Test	Hausman Test	LM Test	Selected Model
Indonesia	FEM (0.0402)	REM (1.0000)	REM (0.0144)	REM
Saudi Arabia	CEM (0.0939)		CEM (0.1841)	CEM
Malaysia	CEM (0.6724)		CEM (0.2912)	CEM

(Source: Processed data using EViews 13, 2026)

Classical Assumption Tests

Table 5 summarises the diagnostic tests. The normality, heteroscedasticity, and autocorrelation tests yield probability values above 0.05 in all three models, although the autocorrelation test for Indonesia is only marginally above this threshold. The multicollinearity test did not indicate correlations above the critical value. On this basis, the models were considered adequate for hypothesis testing.

Table 5. Summary of Classical Assumption Tests

Test	Indonesia	Saudi Arabia	Malaysia	Selected Model
Normality Test	0.9112	0.4925	0.3239	Normally Distributed
Multicollinearity Test	No Multicollinearity			Passed
Heteroscedasticity Test	0.1160	0.3311	0.7596	No Heteroscedasticity
Autocorrelation Test	0.0537	0.5149	0.1092	No Autocorrelation

All probability values exceed 0.05, indicating that the regression models passed the classical assumption tests.

(Source: Processed data using EViews 13, 2026)

Coefficient of Determination (R^2)

Table 6 shows that the explanatory power of the models differs across countries. The R^2 is 0.3081 for Saudi Arabia, 0.1684 for Indonesia,

and 0.1406 for Malaysia. The independent variables therefore account for less than one-third of the variation in APS in Saudi Arabia and less than one-fifth in Indonesia and Malaysia, implying that most variation in asset growth is driven by factors outside the model.

Tabel 6: Coefficient of Determination (R^2) Results

Country	R-Squared	Interpretation
Indonesia	0.1684	Very Weak
Saudi Arabia	0.3081	Weak
Malaysia	0.1406	Very Weak

(Source: Processed data using EViews 13, 2026)

Hypothesis Testing Results

Hypothesis testing was conducted to examine the associations of digital transaction variables and financial performance variables with Islamic banking asset growth in Indonesia, Saudi Arabia, and Malaysia. The results of the partial test (t-test) are presented in Table 7.

Table 7. Summary of Hypothesis Testing Results

Country	Variable	β Coefficient	p-value	Hypothesis
Indonesia	NTP	9.803221	0.009415*	Accepted
	NRP	-3.997795	0.015475*	Rejected
	JPM	-9.865239	0.006031*	Rejected
	ROA	0.017127	0.192094	Rejected
	ROE	-0.045804	0.219834	Rejected
	CAR	-0.182520	0.268989	Rejected
	CIR	-0.240085	0.235170	Rejected
Saudi Arabia	NTP	0.320187	0.877230	Rejected
	NRP	0.060453	0.869211	Rejected
	JPM	-0.682769	0.716280	Rejected
	ROA	-0.041379	0.111155	Rejected
	ROE	0.084027	0.005304*	Accepted
	CAR	-0.268595	0.147905	Rejected
	CIR	0.130077	0.176762	Rejected
Malaysia	NTP	-1.099632	0.091700	Rejected
	NRP	0.189332	0.106938	Rejected
	JPM	1.334838	0.098279	Rejected

	ROA	-0.005591	0.891719	Rejected
	ROE	0.029171	0.571405	Rejected
	CAR	-0.275637	0.042290*	Rejected
	CIR	0.049810	0.738770	Rejected

*Significant at < 0.05

(Source: Processed data using EViews 13, 2026)

In the Indonesian model, NTP is positively and significantly associated with APS, whereas NRP and JPM are negatively and significantly associated with APS; none of the financial ratios are significant. H1 is therefore supported for Indonesia, while H2 and H3 are not supported because the significant associations run opposite to the hypothesised direction. In the Saudi Arabian model, ROE is the only significant variable and is positively associated with APS, supporting H5. In the Malaysian model, CAR is negatively and significantly associated with APS, contrary to H6; NTP and JPM have probability values below 0.10 but above 0.05. ROA and CIR are not significant in any model, so H4 and H7 are not supported.

Table 8 shows that the independent variables are jointly significant only in the Saudi Arabian model. In the Indonesian and Malaysian models, they are not jointly significant at the 5% level. For Indonesia, the combination of individually significant digital coefficients and an insignificant joint test is consistent with strongly correlated regressors and calls for cautious interpretation of the individual coefficients.

Table 8. Summary of Simultaneous Test Results (F-Test)

Country	F-statistic	Prob. F-statistic	Description
Indonesia	1.793799	0.104476	Insignificant
Saudi Arabia	3.944063	0.001277	Significant*
Malaysia	1.777075	0.104199	Insignificant

*Significant at < 0.05

(Source: Processed data using EViews 13, 2026)

Discussion

This section interprets the patterns in Table 7 rather than restating them. Three cautions apply throughout. First, the estimates are associations, not causal effects. Second, NTP, NRP, and JPM describe the digital transaction environment shared by all banks in a country-year, not the digital activity of individual banks. Third, the mechanisms discussed below are possible explanations drawn from theory and context; they were not tested directly in the model.

Market-Based Digital Transaction Value and Islamic Banking Asset Growth

The scale of the digital transaction market is positively associated with Islamic banking asset growth in Indonesia, but not in Saudi Arabia or Malaysia. Economically, a larger digital payment market means that more economic activity is settled through channels that can be linked to bank accounts, generating payment flows that banks may convert into deposits, fee income, and information for financing decisions (Ardyne et al., 2023; Parlour et al., 2022). In Penrosean terms, the digital market enlarges banks' external productive opportunity. The rapid expansion of retail digital payments under QRIS (BI, 2020) may have made this opportunity particularly relevant in Indonesia. This association should not, however, be read as evidence that banks' own digital transactions raised their assets: NTP is a country-year indicator that rose steadily over the period (Figure 1), so its coefficient may also capture other developments that trended upward in the Indonesian banking system. The absence of an association in Saudi Arabia and Malaysia may indicate that a larger share of digital payment activity there is captured by platforms or institutions other than Islamic banks, consistent with competition for payment flows (Feyen et al., 2021; Phan et al., 2020).

Average Transaction Value per User and Islamic Banking Asset Growth

Average transaction value per user is negatively associated with asset growth in Indonesia but not in Saudi Arabia or Malaysia. A logical starting point is that this indicator measures the size of digital transactions, not whether the underlying funds remain with Islamic banks. A larger payment may pass through an e-wallet, a conventional bank, or a

card network and leave no lasting deposit or financing at an Islamic bank. Transaction size is therefore distinct from transaction intensity, the depth of the customer relationship, deposit mobilisation and financing expansion, which are the channels through which asset growth would occur. Moreover, NRP is a ratio. As digital payments spread to many new users who make small, frequent retail payments, the number of users may grow faster than transaction value, so value per user may fall even as digital activity broadens. A negative association may therefore reflect the composition of digital adoption rather than any adverse role of larger transactions. Because total transaction value is approximately the product of NRP and the number of users, the NRP coefficient is also estimated largely conditional on NTP and JPM, and its sign may partly reflect this overlap. In Saudi Arabia and Malaysia, the absence of an association suggests that transaction size alone is not sufficient to explain Islamic banking asset growth.

Mobile Transaction Users and Islamic Banking Asset Growth

The number of digital transaction users is negatively associated with asset growth in Indonesia and is not significantly associated with it in Saudi Arabia or Malaysia. The key distinction is that user numbers do not reflect the depth of users' relationship with banks. A larger user base does not automatically imply larger account balances, more deposits, more financing, higher-value transactions, or stronger ties with Islamic banks. New users are often added through small-value, convenience-oriented payments (Rianita & Fasa, 2024), and many may be served by non-bank wallets or by conventional banks, particularly in Indonesia, where Islamic banks hold a small share of the banking market. In other words, the breadth of digital adoption does not necessarily translate into the depth of banking engagement. In addition, for a given total transaction value, more users imply lower value per user. Hence, the JPM coefficient captures the association between a more fragmented, smaller-ticket digital market and asset growth, conditional on NTP. Wider digital access may also make deposits more mobile (Koont et al., 2024), although this channel was not examined here. These explanations remain possibilities rather than demonstrated mechanisms.

Return on Assets (ROA) and Islamic Banking Asset Growth

ROA is not significantly associated with asset growth in any country. This finding suggests that current profitability alone may not explain annual changes in Islamic banks' assets. From a Penrosean perspective, profits are a source of internal finance, but they drive growth only if retained and deployed into new financing; profits may instead be distributed or held as reserves, and asset growth may depend more directly on funding availability and financing demand. The result is therefore not consistent with the expectation that profitability supports expansion in the short run.

Return on Equity (ROE) and Islamic Banking Asset Growth

ROE is positively associated with asset growth only in Saudi Arabia, consistent with H5 and with earlier evidence linking ROE to Islamic banking assets (Mahendra & Musthofa, 2023). Theoretically, higher returns on equity generate internal capital that can support further financing, in line with Penrose's emphasis on financial resources as a condition for growth. One possible explanation for why this association appears in Saudi Arabia is the structure of its banking market: Islamic banking dominates the domestic banking system, and the market is relatively concentrated (Al-Muharrami, 2009), so profitable banks may have greater scope to deploy retained earnings in domestic financing opportunities associated with the Vision 2030 agenda (Sinaga, 2025). The absence of a similar association in Indonesia and Malaysia may indicate that returns on equity are not systematically reinvested in balance-sheet expansion in those markets.

Capital Adequacy Ratio (CAR) and Islamic Banking Asset Growth

CAR is negatively associated with asset growth in Malaysia and is not significantly associated with it in Indonesia or Saudi Arabia. Contrary to H6, the Malaysian result indicates that banks with lower CAR tend to exhibit higher asset growth. This pattern may, however, reflect the reverse. When banks expand financing rapidly, risk-weighted assets can grow faster than capital accumulated through retained earnings, so banks with stronger asset growth may record lower CAR. This interpretation is consistent with evidence that bank leverage rises as balance sheets expand

(Adrian & Shin, 2010), including among Islamic banks in Malaysia and the GCC (Hammami & Riahi, 2021). Accordingly, the negative association should not be interpreted as evidence that lower CAR causes higher asset growth. The current model cannot establish the direction of the relationship, which would require an analysis of timing, such as models with lagged capital ratios. The absence of an association in Indonesia and Saudi Arabia is consistent with Kristianingsih et al. (2022).

Cost-to-Income Ratio (CIR) and Islamic Banking Asset Growth

CIR is not significantly associated with asset growth in any country. This lack of association may indicate that operational efficiency, as captured by CIR, does not translate into asset growth within the same year. Expanding banks may also incur higher operating costs for technology, networks, and staff during an investment phase (Alzoubi et al., 2026; Megananda et al., 2025), which could offset any efficiency-related gains in the short run.

Explanatory Power and Cross-Country Patterns

The relatively low R^2 values, particularly for Indonesia and Malaysia, together with the insignificant joint tests in these two models, indicate that the selected variables capture only a limited part of the variation in Islamic banking asset growth. The findings should therefore be read as selected empirical associations rather than a comprehensive account of the determinants of asset growth. Other factors that were not included may matter, such as macroeconomic conditions, the regulatory environment, financing demand, deposit mobilisation, bank-specific characteristics and events such as mergers or restructuring, and institutional factors; whether these factors explain the remaining variation cannot be determined from the present model. The wide dispersion of asset growth among Indonesian banks suggests that bank-specific developments may be especially important there.

Across countries, the patterns differ: digital transaction indicators are associated with asset growth in Indonesia, profitability in Saudi Arabia, and capital position in Malaysia. These differences reflect the countries' contexts: Indonesia's rapidly expanding digital payment ecosystem

combined with a small Islamic banking share, Saudi Arabia's large and concentrated Islamic banking sector, and Malaysia's more established Islamic banking system and regulatory framework. These contextual factors were not modelled, so they are offered as possible explanations rather than tested determinants.

Implications for the Theory of Firm Growth

The findings provide partial empirical evidence relevant to the Theory of Firm Growth. The positive associations of NTP in Indonesia and ROE in Saudi Arabia are consistent with Penrose's view that growth reflects both external opportunities and internal financial resources. However, the negative associations of NRP and JPM in Indonesia and of CAR in Malaysia, and the absence of associations for ROA and CIR, are inconsistent with theoretical expectations. Taken together, the results suggest that the relevance of digital opportunities and financial resources for Islamic banking asset growth depends on country context and on whether opportunities in the digital market are captured by Islamic banks. Because the mechanisms were not tested directly, the study applies the theory empirically rather than extending it.

CONCLUSION

This study examined how digital transaction indicators and financial performance relate to Islamic banking asset growth in Indonesia, Saudi Arabia, and Malaysia from 2018 to 2024. In Indonesia, digital transaction value is positively associated with asset growth, whereas transaction value per user and mobile transaction users are negatively associated with it. In Saudi Arabia, ROE is positively associated with asset growth, and in Malaysia, CAR is negatively associated with it; ROA and CIR show no significant association in any country. Given the limited explanatory power of the models, these results should be interpreted as selected associations rather than a comprehensive account of Islamic banking asset growth.

The findings provide partial empirical evidence relevant to the Theory of Firm Growth regarding external opportunities and internal resources: the results for digital transaction value and ROE are consistent

with the theory, whereas the others are not. The mechanisms discussed were not tested and therefore remain possible interpretations. These findings suggest that the digital transaction environment and banks' financial positions may be considered jointly when interpreting asset growth across different country contexts.

This study is limited by the country-year nature of NTP, NRP, and JPM, which reflect the digital transaction environment rather than individual-bank activity; by its coverage of three countries over seven years; by the absence of macroeconomic, institutional and other control variables; and by its observational design, which precludes causal inference. Future research should align the level of measurement with the unit of analysis, use bank-specific digital indicators, add macroeconomic and institutional controls, extend the observation period and country coverage, and apply appropriate robustness and identification strategies.

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