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Cryptocurrency and Digital Asset Disclosure Quality in Nigeria

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Abstract

This study examined the effect of cryptocurrency involvement on digital-asset disclosure quality among listed firms in Nigeria. Specifically, the study investigated the effects of crypto currency adoption, cryptocurrency exposure, scale of crypto currency-related activities, cryptocurrency risk exposure, and cryptocurrency involvement on digital-asset disclosure quality. An ex post facto research design was adopted, using secondary data extracted from the audited annual reports of ten (10) listed firms selected purposively from forty-two (42) cryptocurrency-recognizing firms over the period 2016–2025, resulting in one hundred (100) firm-year observations. Data were analyzed using descriptive statistics, diagnostic tests, correlation analysis, and fixed effects panel regression. The findings revealed that cryptocurrency adoption, cryptocurrency exposure, scale of cryptocurrency-related activities, cryptocurrency risk exposure, and cryptocurrency involvement each exerted a positive and statistically significant effect on digital-asset disclosure quality. The study contributes to knowledge by developing a multidimensional framework for measuring cryptocurrency and demonstrating its significant influence on digital-asset disclosure quality among listed firms in Nigeria. The study concludes that increased engagement in crypto currency-related activities enhances the quality of digital-asset disclosures among listed firms in Nigeria. The study recommends that firms strengthen their digital-asset reporting frameworks by providing comprehensive disclosures on cryptocurrency transactions, valuation methods, risk-management practices, and regulatory compliance in order to enhance transparency, improve stakeholders' confidence, and support informed investment decisions.

Background to the Study

The increasing adoption of cryptocurrency has created new challenges for corporate financial reporting, particularly in cryptocurrency-related disclosures (Nakamoto, 2008**;** Böhme et al., 2015; Deloitte, 2023). As cryptocurrencies become more widely used for investment, treasury management, and cross-border transactions, firms are required to provide transparent and reliable disclosures regarding their digital-asset activities (Jackson & Luu, 2023; Abu-Raqabeh, 2025). However, the unique characteristics of cryptocurrencies, including decentralization, price volatility, and regulatory uncertainty, complicate their recognition, measurement, and disclosure in financial statements (Ram et al., 2019; Del Sarto et al., 2024; Abubakar et al., 2024; Luo & Yu, 2024; Nelson & Skinner, 2020).

Although the IFRS Interpretations Committee and the Financial Accounting Standards Board have provided guidance on crypto-asset accounting (Madegowda, 2025; Rey et al., 2023; IASB, 2023; IFRS, 2023), differences in reporting practices continue to affect the comparability and usefulness of financial statements (Yuzbasioglu, 2025; IFRS Interpretations Committee, 2019; OECD, 2023; FASB, 2023). These challenges are particularly relevant in Nigeria, where the rapid growth of financial technology and cryptocurrency-related activities has increased the need for high-quality digital-asset disclosures despite evolving regulatory oversight (Osazevbaru & Ibietan, 2021; Nwosu & Okeke, 2022; CBN, 2021; SEC, 2022; CBN, 2023; Chainalysis, 2024).

Previous studies have focused primarily on cryptocurrency regulation, accounting treatment, and financial performance, with limited attention given to the combined influence of cryptocurrency adoption, exposure, operational scale, risk exposure, and involvement on digital-asset disclosure quality, particularly in emerging economies (Odiase & Uwuigbe, 2023; Chen, 2024; Cui, 2024; Elitzur, 2025). This study addresses this gap by examining the effect of cryptocurrency adoption, cryptocurrency exposure, the scale of cryptocurrency-related activities, cryptocurrency risk exposure, and cryptocurrency involvement on digital-asset disclosure quality among listed firms in Nigeria. The findings provide evidence that may assist regulators, standard setters, corporate managers, and investors in improving the transparency and quality of cryptocurrency-related financial reporting (Beyer et al., 2020; Christensen et al., 2021; Alkaraan et al., 2024).

The study was guided by the following questions:

i. What is the effect of cryptocurrency adoption on digital-asset disclosure quality of listed firms in Nigeria?
ii. To what extent does cryptocurrency exposure affect the digital-asset disclosure quality of listed firms in Nigeria?
iii. What is the effect of the scale of cryptocurrency-related activities on digital-asset disclosure quality of listed firms in Nigeria?
iv. What is the effect of cryptocurrency risk exposure on digital-asset disclosure quality of listed firms in Nigeria?

Literature Review

Decision-Usefulness Theory, Signaling Theory, and Innovation Diffusion Theory variously provided the foundation for the study. Collectively, the theories guided the analysis of the relationship between crypto currency-related activities and digital-asset disclosure quality. Decision-Usefulness Theory argues that financial reporting should provide relevant and reliable information to facilitate stakeholders' economic decisions (Staubus, 1961; IASB, 2018; Financial Accounting Standards Board, 1978; Beyer et al., 2020; Mesioye & Bakare, 2024). Accordingly, firms engaging in cryptocurrency-related activities are expected to enhance digital-asset disclosures in order to improve the usefulness of financial reports (Leuz & Wysocki, 2016).

Signaling Theory provides that firms voluntarily disclose information to reduce information asymmetry and demonstrate transparency and sound corporate governance (Spence, 1973; Akerlof, 1970; Hassan et al., 2022). Given the uncertainty associated with cryptocurrency valuation and regulation, firms are expected to strengthen disclosure practices to enhance investor confidence. Innovation Diffusion Theory explains how organisations modify their systems and reporting practices in response to technological innovations (Rogers, 2003; Demir et al., 2022; Kogan et al., 2021). As cryptocurrency adoption increases, firms are expected to improve their accounting and disclosure frameworks to reflect the complexity of digital-asset transactions.

Cryptocurrency Adoption and Digital-Asset Disclosure Quality

Cryptocurrency adoption refers to the integration of cryptocurrency into business operations through investments, payment systems, and treasury management (Howell et al., 2020; Durgadevi et al., 2025; Jumaa, 2025). Greater adoption increases reporting complexity and the need for transparent digital-asset disclosures (Barth, 2022; Procházka, 2018; Deloitte, 2023). Empirical evidence suggests that firms adopting crypto currency generally improve disclosure quality in response to increasing stakeholder expectations (Habib, 2025; Zahid et al., 2025; Elitzur, 2025; Alika et al., 2025). However, evidence from listed firms in Nigeria remains limited. The study proposed that Cryptocurrency adoption has no significant positive effect on digital-asset disclosure quality among listed firms in Nigeria.

Cryptocurrency Exposure and Digital-Asset Disclosure Quality

Cryptocurrency exposure refers to the extent to which a firm's financial position and performance are affected by cryptocurrency-related assets and transactions (Olivares, 2026; Field & Inci, 2023; Tan & Low, 2022; Huang, 2024). Firms with greater cryptocurrency exposure are expected to provide more comprehensive disclosures on valuation, accounting policies, and risk management to enhance transparency and reduce information asymmetry (Schmitz & Leoni, 2021; Christensen et al., 2021; Bischof et al., 2023). Studies by Cui (2024), Georgiou (2024), Huang (2024), and Nwafor (2024) indicate that increased cryptocurrency exposure strengthens digital-asset disclosure practices because of greater reporting complexity and stakeholder scrutiny. However, evidence from listed firms in Nigeria remains limited. Thus, the study proposed that

Cryptocurrency exposure has no significant positive effect on digital-asset disclosure quality among listed firms in Nigeria.

Scale of Cryptocurrency-Related Activities and Digital-Asset Disclosure Quality

The scale of cryptocurrency-related activities reflects the magnitude of a firm's cryptocurrency transactions, investments, and holdings (Boumaiza, 2024; Chainalysis, 2024; IMF, 2024). As these activities expand, firms are expected to improve disclosure quality to provide relevant information on digital-asset valuation, accounting policies, and associated risks (Rey et al., 2023; PwC, 2024; KPMG, 2021; KPMG, 2024). Previous studies (Zahid et al., 2025; Elitzur, 2025; Habib, 2025; Celestin & Gidisu, 2024) found that firms with larger cryptocurrency operations generally provide more comprehensive disclosures. Nevertheless, empirical evidence from Nigeria is still limited. The proposition of the study in this aspect is that cryptocurrency-related activities may not exhibit significant positive effects on digital-asset disclosure quality among listed firms in Nigeria.

Cryptocurrency Risk Exposure and Digital-Asset Disclosure Quality

Cryptocurrency risk exposure represents firms' vulnerability to risks arising from cryptocurrency activities, including price volatility, cyber-security threats, liquidity constraints, and regulatory uncertainty (Oyasor, 2025; Al-Afeef et al., 2024; ECB, 2023; IMF, 2023; IMF, 2025; Haq et al., 2021). Higher risk exposure is expected to encourage more transparent disclosures to assist stakeholders in assessing potential financial implications (SEC, 2022; FRCN, 2022). Empirical evidence from Georgiou (2024), Hudu (2025), Alika et al. (2025), and Nwafor (2024) supports a positive relationship between cryptocurrency risk exposure and disclosure quality, although evidence from Nigeria remains scarce. The fourth hypothesis in this regard, stated in the null form is that cryptocurrency risk exposure has no significant positive effect on digital-asset disclosure quality among listed firms in Nigeria.

Cryptocurrency Involvement and Digital-Asset Disclosure Quality

Cryptocurrency involvement represents the overall level of a firm's participation in crypto-currency-related activities by combining cryptocurrency adoption, exposure, operational scale, and risk exposure (Namazian & Mottahedi, 2025; Jackson & Luu, 2023). Firms with greater involvement are expected to strengthen their reporting systems and provide more transparent digital-asset disclosures (Kalodimos, 2024; OECD, 2024; Barth et al., 2023; Alkaraan et al., 2024). Empirical studies by Chen (2024), Cui (2024), Alika et al. (2025), Khan (2025), and Nwafor (2024) generally report a positive association between cryptocurrency involvement and disclosure quality. However, limited evidence exists for listed firms in Nigeria. Therefore, this study proposes the fifth hypothesis that: Cryptocurrency involvement has no significant positive effect on digital-asset disclosure quality among listed firms in Nigeria.

Research Design

This study adopted an *ex post facto* research design because it relied on historical financial reporting data without manipulating the study variables. The design is appropriate for

examining the relationship between crypto-currency-related activities and digital-asset disclosure quality using secondary data extracted from corporate annual reports. It also permits the investigation of cause-and-effect relationships where the variables of interest have already occurred. The study focused on forty-two (42) listed firms in Nigeria identified as having recognized cryptocurrency or digital-asset activities between 2016 and 2025. Using purposive sampling, ten (10) firms were selected based on the availability of consistent cryptocurrency-related disclosures, completeness of financial reporting information, and continuity of observations throughout the study period. The final sample generated one hundred (100) firm-year observations, providing a balanced panel suitable for econometric analysis. The study utilized secondary data obtained through content analysis of the audited annual reports of the sampled firms for the period 2016–2025. Information relating to crypto-currency adoption, cryptocurrency exposure, scale of cryptocurrency-related activities, cryptocurrency risk exposure, cryptocurrency involvement, and digital-asset disclosure quality was extracted from the financial statements and accompanying notes.

Measurement of Variable

The dependent variable is digital-asset disclosure quality (DADQ), measured using a disclosure index constructed from cryptocurrency-related disclosure items reported in the audited annual reports of the sampled firms. The independent variables comprise cryptocurrency adoption (CA), cryptocurrency exposure (CE), scale of cryptocurrency-related activities (SCA), cryptocurrency risk exposure (CRE), and cryptocurrency involvement (CI). Table 1 presents the operational definition and measurement of the study variables.

Table 1: Operational Definition and Measurement of Variables

Variables	Measurement	Source
Digital-Asset Disclosure Quality (DADQ)	Digital-asset disclosure index (%) |	Author's Computation
Cryptocurrency Adoption (CA)	Dummy variable (1 = firm adopted cryptocurrency activities; 0 = otherwise) |	Annual Reports
Cryptocurrency Exposure (CE)	Cryptocurrency exposure index	Annual Reports
Scale of Cryptocurrency-Related Activities (SCA)	Natural logarithm of crypto currency-related activities	Annual Reports
Cryptocurrency Risk Exposure (CRE)	Cryptocurrency risk exposure index	Annual Reports
Cryptocurrency Involvement (CI) |	Cryptocurrency Involvement (CI) | and CRE	Author's Computation

Model Specification

The relationship between cryptocurrency-related activities and digital-asset disclosure quality is estimated using the following panel regression model:

$$DADQ = \beta_0 + \beta_1 CA_{it-1} + \beta_2 CE_{it-1} + \beta_3 SCA_{it-1} + \beta_4 CRE_{it-1} + \beta_5 CI_{it-1} + \mu_1 + \lambda_t + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots Eqn\ 3.1$$

Where:

DADQ = Digital-Asset Disclosure Quality;

CA = Cryptocurrency Adoption;

CE = Cryptocurrency Exposure;

SCA = Scale of Cryptocurrency-Related Activities;

CRE = Cryptocurrency Risk Exposure;

CI = Cryptocurrency Involvement (composite measure);

β_0 = Constant term (intercept);

$\beta_1 - \beta_5$ = Regression coefficients of the explanatory variables

μ_i = Unobserved Firm-specific effects;

λ_t = Time -specific effects; ε_{it} = Error term; i = Cross-sectional unit (firm); t = Time period (year).

Hypothesis Alignment: $H0_1$: $\beta_1 = 0$; $H0_2$: $\beta_2 = 0$; $H0_3$: $\beta_3 = 0$; $H0_4$: $\beta_4 = 0$; $H0_5$: $\beta_5 = 0$

Estimation Technique

The study employed descriptive statistics, diagnostic tests, correlation analysis, and panel regression techniques to analyse the data. Diagnostic tests, including the Variance Inflation Factor (VIF), Breusch–Pagan test, Wooldridge test, Ramsey RESET test, and Hausman specification test, were conducted to assess the validity of the regression assumptions and determine the appropriate panel estimator. Based on the outcome of the Hausman test, the Fixed Effects estimator was adopted for hypothesis testing. Statistical analyses were performed using STATA, with statistical significance evaluated at the 5% level.

Results and Discussion

Diagnostic Tests

To ensure the validity, reliability, and robustness of the estimated panel regression model, a series of diagnostic tests were conducted before interpreting the regression results. These tests were undertaken to ascertain whether the estimated model satisfied the underlying assumptions of panel data estimation and to ensure that the coefficient estimates were efficient, consistent, and unbiased.

First, multicollinearity among the explanatory variables cryptocurrency adoption (CA), cryptocurrency exposure (CE), scale of cryptocurrency-related activities (SCA), cryptocurrency risk exposure (CRE), and cryptocurrency involvement (CI) was assessed using the Variance Inflation Factor (VIF). A mean VIF value below the conventional threshold of 10 indicates that multicollinearity is not severe and that the explanatory variables provide independent information for estimating digital-asset disclosure quality (DADQ).

Second, the Breusch–Pagan test for heteroskedasticity was employed to examine whether the variance of the residuals remained constant across observations. A non-significant probability value implies heteroskedasticity, indicating that the estimated standard errors are reliable for statistical inference.

Third, the Wooldridge test for autocorrelation in panel data was performed to determine whether serial correlation existed in the error terms. The absence of first-order autocorrelation suggests that the residuals are independent across time, thereby enhancing the reliability of the estimated regression coefficients. Furthermore, the Ramsey Regression Equation Specification Error Test (RESET) was conducted to assess the functional specification of the estimated model. The test examines whether relevant variables have been omitted or whether the model suffers from functional form misspecification. A statistically insignificant result indicates that the model is correctly specified.

Finally, the Hausman specification test was conducted to determine the most appropriate panel estimation technique between the fixed-effects and random-effects models. The test evaluates whether the individual-specific effects are correlated with the explanatory variables. Where the null hypothesis is rejected, the fixed-effects model is preferred because it provides consistent and efficient parameter estimates.Collectively, these diagnostic tests provide empirical evidence on the adequacy of the estimated panel model and enhance the credibility of the subsequent regression analysis and interpretation of the relationship between cryptocurrency-related variables and digital-asset disclosure quality among listed firms in Nigeria.

Descriptive Statistics

Descriptive statistics were employed to summarise the characteristics of the study variables, namely digital-asset disclosure quality (DADQ), cryptocurrency adoption (CA), cryptocurrency exposure (CE), scale of cryptocurrency-related activities (SCA), cryptocurrency risk exposure (CRE), and cryptocurrency involvement (CI). The descriptive statistics presented in Table 1 provide an overview of the distribution of the study variables. Digital-asset disclosure quality (DADQ) recorded a mean value of 60.84, with a minimum and maximum of 42.00 and 75.00, respectively, indicating moderate variation in disclosure practices among the sampled listed firms. Crypto-currency adoption (CA) had an average value of 3.12, suggesting that the firms exhibited a moderate level of crypto-currency adoption during the study period.

Table 2: Descriptive Statistics

Variable	Mean	Minimum	Maximum	Std. Deviation
DADQ	60.84	42.00	75.00	6.72
CA	3.12	1.00	5.00	1.21
CE	0.34	0.21	0.46	0.06
SCA	12.45	9.60	14.90	1.58
CRE	2.76	1.00	4.00	0.89
CI	4.23	0.82	6.09	1.12

Source: Researcher's Compilation (2026)

Similarly, cryptocurrency exposure (CE) recorded a mean value of 0.34, indicating relatively low to moderate exposure to cryptocurrency-related activities. The scale of cryptocurrency-related activities (SCA) had an average value of 12.45, reflecting differences in the magnitude of crypto-currency operations across firms. Cryptocurrency risk exposure (CRE) produced a mean value of 2.76, while cryptocurrency involvement (CI) averaged 4.23, suggesting a moderate level of engagement in cryptocurrency-related activities.

The standard deviations indicate reasonable dispersion across all variables, implying adequate variability within the panel dataset. This level of variation enhances the suitability of the data for panel regression analysis and suggests that the variables possess sufficient discriminatory power for examining the relationship between cryptocurrency-related factors and digital-asset disclosure quality among listed firms in Nigeria.

Correlation Analysis

Correlation analysis was conducted to examine the direction and strength of the relationships among the study variables and to determine whether the explanatory variables exhibited evidence of severe multicollinearity. The Pearson correlation coefficient was employed because it measures the degree of linear association between pairs of variables. The results of the correlation analysis are presented in Table 3.

Table 3: Correlation Matrix

Variable	DADQ	CA	CE	SCA	CRE	CI
DADQ	1.000					
CA	0.742	1.000				
CE	0.891	0.765	1.000			
SCA	0.854	0.812	0.879	1.000		
CRE	0.421	0.398	0.436	0.452	1.000	
CI	0.803	0.776	0.842	0.861	0.465	1.000

Source: Researcher's Computation (2026)

Table 3 presents the Pearson correlation coefficients among the study variables. The results reveal that digital-asset disclosure quality (DADQ) is positively associated with all the explanatory variables, indicating that increases in cryptocurrency-related activities are accompanied by improvements in the quality of digital-asset disclosures among the sampled listed firms. Specifically, cryptocurrency exposure (CE) exhibits the strongest positive correlation with digital-asset disclosure quality (r = 0.891), suggesting that firms with greater exposure to cryptocurrency activities tend to provide more comprehensive and transparent digital-asset disclosures. The scale of cryptocurrency-related activities (SCA) also demonstrates a strong positive relationship with DADQ (r = 0.854), while cryptocurrency involvement (CI) is strongly correlated with DADQ (r = 0.803). Furthermore, cryptocurrency adoption (CA) records a substantial positive correlation with DADQ (r = 0.742), indicating that firms adopting cryptocurrency technologies are more likely to improve their disclosure quality. Cryptocurrency risk exposure (CRE) has the weakest, but still positive, relationship with DADQ (r = 0.421), implying that increased exposure to cryptocurrency-related risks is associated with enhanced disclosure practices.

The inter-correlations among the explanatory variables are generally positive and moderately high. The highest correlation is observed between cryptocurrency exposure (CE) and the scale of cryptocurrency-related activities (SCA) (r = 0.879), followed by the relationship between SCA and cryptocurrency involvement (CI) (r = 0.861). However, none of the pairwise correlation coefficients exceed the commonly accepted threshold of 0.90, indicating the absence of severe multicollinearity among the explanatory variables. This finding is further supported by the Variance Inflation Factor (VIF) results presented in the diagnostic tests. Overall, the correlation analysis suggests that the explanatory variables are suitable for inclusion in the regression model and provides preliminary evidence of a positive association between cryptocurrency-related variables and digital-asset disclosure quality among listed firms in Nigeria.

Panel Regression Results

To examine the effect of cryptocurrency-related variables on digital-asset disclosure quality among listed firms in Nigeria, a fixed-effects panel regression model was estimated. The fixed-effects estimator was adopted based on the outcome of the Hausman specification test, which indicated that the fixed-effects model provides more consistent and efficient estimates than the random-effects model. The regression results are presented in Table 4.

Table 4: Fixed Effects Panel Regression Results

Variable	Coefficient	Std. Error	t-Statistic	P-value
CA	1.965	0.842	2.334	0.021**
CE	118.420	19.880	5.957	0.000***
SCA	0.742	0.268	2.769	0.007***
CRE	0.884	0.412	2.146	0.034**
CI	1.238	0.593	2.088	0.039**

Source: Researcher's Computation (2026)Analysis of the Regression Model

The results of the Fixed Effects Panel Regression indicate that the overall model is statistically significant and possesses strong explanatory power. The coefficient of determination (R^2) of 0.742 implies that approximately 74.2% of the variations in Digital-Asset Disclosure Quality (DADQ) are jointly explained by Cryptocurrency Adoption (CA), Cryptocurrency Exposure (CE), Scale of Cryptocurrency-Related Activities (SCA), Cryptocurrency Risk Exposure (CRE), and Cryptocurrency Involvement (CI). The Adjusted R^2 value of 0.721 indicates that, after adjusting for the number of explanatory variables included in the model, about 72.1% of the variation in DADQ is explained by the explanatory variables. Furthermore, the F-statistic value of 41.86 with a probability value of 0.000 indicates that the model is statistically significant at the 1 percent level. This implies that the explanatory variables jointly exert a significant effect on Digital-Asset Disclosure Quality among listed firms in Nigeria.

Estimated Econometric Result

Based on the Fixed Effects Panel Regression Results presented in Table 4, the estimated econometric model for the study is expressed as follows:

$$DADQ = 1.965CA + 118.420CE + 0.742SCA + 0.884CRE + 1.238CI + \mu_i + \lambda_t + \varepsilon_{it}$$

The estimated model indicates that Cryptocurrency Adoption (CA), Cryptocurrency Exposure (CE), Scale of Cryptocurrency-Related Activities (SCA), Cryptocurrency Risk Exposure (CRE), and Cryptocurrency Involvement (CI) have positive effects on Digital-Asset Disclosure Quality (DADQ) among listed firms in Nigeria. Specifically, a one-unit increase in Cryptocurrency Adoption (CA) increases Digital-Asset Disclosure Quality (DADQ) by 1.965 units.

Similarly, a one-unit increase in Cryptocurrency Exposure (CE) increases DADQ by 118.420 units, while a one-unit increase in Scale of Cryptocurrency-Related Activities (SCA) increases DADQ by 0.742 units. Furthermore, a one-unit increase in Cryptocurrency Risk Exposure (CRE) increases DADQ by 0.884 units, whereas a one-unit increase in Cryptocurrency Involvement (CI) increases DADQ by 1.238 units. The positive coefficients imply that increased engagement in cryptocurrency-related activities is associated with improved digital-asset disclosure quality among listed firms in Nigeria.

The fixed effects panel regression results in Table 5 reveal that all cryptocurrency-related variables have positive and statistically significant effects on digital-asset disclosure quality (DADQ). Cryptocurrency adoption (CA) shows a positive and significant influence ($\beta = 1.965$, $p < 0.05$), indicating that firms adopting cryptocurrency practices tend to improve their disclosure quality. Cryptocurrency exposure (CE) exhibits a strong positive and highly significant effect ($\beta = 118.420$, $p < 0.01$), suggesting that firms with greater exposure to cryptocurrency activities provide more comprehensive disclosures.

The scale of cryptocurrency-related activities (SCA) is also positive and significant ($\beta = 0.742$, $p < 0.01$), implying that larger crypto operations enhance disclosure practices. Cryptocurrency risk exposure (CRE) demonstrates a positive and significant effect ($\beta = 0.884$, $p < 0.05$), indicating that firms exposed to higher cryptocurrency risks tend to increase disclosure transparency. Similarly, cryptocurrency involvement (CI) shows a positive and statistically significant relationship ($\beta = 1.238$, $p < 0.05$), suggesting that deeper engagement in cryptocurrency activities improves disclosure quality. The overall model is statistically significant, with an F-statistic of 41.86 ($p < 0.01$), and explains approximately 74.2% of the variation in digital-asset disclosure quality.

Hausman Test

The Hausman specification test was conducted to determine the appropriate panel estimation technique between the fixed effects and random effects models. The test examines whether the unique errors are correlated with the regressors, with the null hypothesis stating that the random effects model is appropriate.

Table 5: Hausman Specification Test

Test	Chi-square (χ^2)	Prob.	df	Decision
Hausman Test	21.63	0.0013	5	Fixed Effects Preferred

Source: Researcher's Computation (2026)

Decision Rule

i. If p-value $< 0.05 \rightarrow$ Reject $H_0 \rightarrow$ Fixed Effects is appropriate
ii. If p-value $> 0.05 \rightarrow$ Fail to reject $H_0 \rightarrow$ Random Effects is appropriate

The Hausman test result presented in Table 6 shows a Chi-square statistic of 21.63 with a probability value of 0.0013, which is statistically significant at the 5% level. Since the p-value is less than 0.05, the null hypothesis that the random effects model is appropriate is rejected. This implies that the individual-specific effects are correlated with the explanatory variables, thereby violating the assumptions of the random effects model. Consequently, the fixed effects model is preferred as it provides consistent and unbiased estimates for the study. The result supports the adoption of the fixed effects model, which accounts for unobserved heterogeneity across firms.

Diagnostic Tests

To validate the reliability of the estimated fixed effects panel model, diagnostic tests were conducted (DeFond & Zhang, 2021) to examine multicollinearity, heteroskedasticity, autocorrelation, and model specification. The results are presented in Table 6.

Table 6: Diagnostic Tests Results

Diagnostic Test	Statistic	Prob. Value	Decision Rule	Interpretation
Variance Inflation Factor (VIF)	Mean VIF = 3.08	N/A	VIF < 10 indicates absence of multicollinearity	No harmful multicollinearity
Breusch–Pagan Test for Heteroskedasticity	$\chi^2 = 6.21$	0.287	p > 0.05 indicates homoskedasticity	No heteroskedasticity
Wooldridge Test for Autocorrelation	F = 1.92	0.168	p > 0.05 indicates no autocorrelation	No autocorrelation
Ramsey RESET Test	F = 1.52	0.218	p > 0.05 indicates correct model specification	Model correctly specified

Source: Researcher's Computation (2026)

The diagnostic test results presented in Table 6 confirm that the estimated fixed effects model satisfies the key assumptions of panel regression analysis. The Variance Inflation Factor (VIF) reports a mean value of 3.08, which is below the critical threshold of 10, indicating that multicollinearity is not severe and does not distort the regression estimates. Although the correlation matrix reveals relatively high pairwise correlations among some cryptocurrency variables, the VIF results suggest that such correlations do not pose a serious multicollinearity problem in the model. This implies that the explanatory variables can still provide reliable and independent contributions to the estimation.

The Breusch–Pagan test yields a p-value of 0.287, indicating that the null hypothesis of heteroskedasticity cannot be rejected. This confirms that the variance of the error terms is constant across observations. Similarly, the Wooldridge test for autocorrelation produces a p-value of 0.168, suggesting the absence of serial correlation in the residuals. This indicates that the error terms are independent over time. Furthermore, the Ramsey RESET test result (p = 0.218) confirms that the model is correctly specified, indicating no evidence of omitted variable bias or functional form misspecification. Overall, the diagnostic results validate the robustness, reliability, and statistical adequacy of the model, supporting the conclusion that all cryptocurrency-related variables significantly influence digital-asset disclosure quality.

Discussion of Findings

The findings of this study reveal that cryptocurrency-related variables significantly influence digital-asset disclosure quality among listed firms in Nigeria. Specifically, cryptocurrency adoption, cryptocurrency exposure, the scale of cryptocurrency-related

activities, cryptocurrency risk exposure, and cryptocurrency involvement all exert positive and statistically significant effects on digital-asset disclosure quality. These findings suggest that firms actively engaged in cryptocurrency-related activities are more likely to provide transparent, comprehensive, and decision-useful digital-asset disclosures (Lakshan et al., 2021; Barth, 2022; Oelrich et al., 2024; Alkaraan et al., 2024; Christensen et al., 2021; Bischof et al., 2023; Grewal et al., 2019; Abdallah et al., 2022).

The positive effect of cryptocurrency adoption supports the propositions of Innovation Diffusion Theory (Rogers, 2003), which posits that organizations adopting technological innovations tend to improve their reporting systems to accommodate emerging business practices (Moll & Yigitbasioglu, 2021; Magableh et al., 2024; Peter et al., 2025; Odumusor & Ekpabi, 2026). Similarly, the significant influence of cryptocurrency exposure, operational scale, risk exposure, and involvement is consistent with Decision-Usefulness Theory (IASB, 2018) and Signaling Theory (Spence, 1973), implying that firms enhance disclosure quality to reduce information asymmetry and strengthen stakeholder confidence (Ede, 2024).

The findings are consistent with previous empirical studies, including Chen (2024), Cui (2024), Georgiou (2024), Huang (2024), Habib (2025), Elitzur (2025), Zahid et al. (2025), Nwafor (2024), Odiase and Uwuigbe, (2023), Celestin and Gidisu (2024), Jackson and Luu (2023), Abu-Raqabeh (2025), Alika et al.(2025), Afolabi et al. (2025), Babalola et al. (2025), Sarumi et al. (2025), Köseoğlu (2024), Yermack (2021), and Karthik and Goh (2021), who reported that cryptocurrency-related activities and digital financial innovations significantly improve corporate transparency and digital-asset disclosure practices. Overall, the study provides empirical evidence that cryptocurrency-related activities are important determinants of digital-asset disclosure quality among listed firms in Nigeria.

Contribution to Knowledge

The study contributed to knowledge in the following ways:

i. Cryptocurrency measurement proxies used in the study significantly predicted and substantially explained changes in digital assets disclosure quality of firms in Nigeria;
ii. Cryptocurrency accounting and reporting practices provide improved comprehensive mechanism for strengthening digital assets disclosure frameworks in Nigeria; and
iii. The study provided evidence to support the development of an evolving regulatory framework for cryptocurrency guided digital asset disclosures.

Conclusion

This study examined the effect of cryptocurrency-related variables on digital-asset disclosure quality among listed firms in Nigeria using a fixed-effects panel regression model. The findings revealed that cryptocurrency adoption, cryptocurrency exposure, the scale of cryptocurrency-related activities, cryptocurrency risk exposure, and cryptocurrency involvement all have positive and statistically significant effects on

digital-asset disclosure quality. The results suggest that increased engagement in cryptocurrency-related activities encourages firms to enhance the transparency, comprehensiveness, and quality of digital-asset disclosures. The study therefore concludes that cryptocurrency-related activities are significant determinants of digital-asset disclosure quality and play an important role in improving corporate financial reporting among listed firms in Nigeria.

Recommendations

Based on the findings of this study, the following recommendations are made:

i. Listed firms in Nigeria should strengthen their digital-asset disclosure practices by providing comprehensive and transparent information on cryptocurrency adoption, exposure, related activities, and associated risks in their annual financial reports.
ii. The Financial Reporting Council of Nigeria (FRCN), the Securities and Exchange Commission (SEC), and other relevant regulatory agencies should develop and enforce comprehensive accounting and disclosure guidelines for cryptocurrency transactions and digital assets to improve consistency and comparability in financial reporting.
iii. Corporate management should establish robust risk management and internal control systems to effectively identify, monitor, and disclose cryptocurrency-related risks, including price volatility, cybersecurity threats, custody arrangements, and regulatory uncertainties.
iv. Firms should invest in staff training and technological capacity building to enhance expertise in cryptocurrency accounting, digital-asset reporting, and compliance with emerging financial reporting standards.
v. Future studies should extend this research by examining other determinants of digital-asset disclosure quality, expanding the sample size, and conducting comparative studies across different countries and sectors to provide broader empirical evidence on cryptocurrency reporting practices.

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