Journal of Innovative Construction and Petrochemical Technologies, Vol.3, No.1 (June, 2026), 120-129

E-ISSN: 3007-9861 | DOI: https://doi.org/10.71285/icpt.v3i1.66

Journal of Innovative Construction and Petrochemical Technologies
https://icpt.ouk.kz/index.php/icpt/index



Research Article

Check for updates

The Impact of Digital Transformation on the Market Performance of Commercial Banks and Testing the Mediating Role of Financial Inclusion: An Applied Study of a Sample of Banks Listed on the Iraq Stock Exchange for the Period (2018–2025)

Mohammed Abdulkareem Ahmed[1], Abdullah Mhaimeed Hawas[2]
[1,2]College of management and economic
Email: mohammed_alaanizy@tu.edu.iq, Abdullah.m.2021@tu.edu.iq

Abstract: The purpose of this study is to explore the role of digital transformation in commercial banks' market performance in Iraq and to verify its role as a mediator between these two variables. The data used in the study was collected manually from the financial statements of Iraqi banks, which are audited and published on the website of the Securities Commission, for the period (2018-2025), along with the closing prices extracted from the bulletins of the Iraqi capital market for the same period for the study sample banks. There are 77 observations in the sample for each bank year. Digital transformation was assessed through net intangible assets (measured by the ratio of net intangible assets, which is software and systems, to total assets) financial inclusion was measured as the ratio of savings deposits to customer deposits, and market performance was measured by Tobin's Q and the market-to-book ratio. A fixed-effects model, with SE clustered at bank level, was used, and indirect effects tested through the bootstrapping method. That resulted in positive and statistically significant results in terms of market performance as evidenced by Tobin's Q, which proved resilient with most tests of robustness. But there was no strong digital transformation and financial inclusion relationship and the indirect effect was not significant. Hence the mediation hypothesis was not accepted. This is interpreted as reflecting that, at this stage, digitalization in the Iraqi banking sector is more for regulating market operations and salary domiciliation than as a tool to attract individual savings. The study suggests the Central Bank of Iraq to mandate banks to publish uniform metrics of digital services.

Keywords Digital transformation, financial inclusion, market performance, Tobin's Q, Iraqi banks, panel data.

Copyright © Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY).

INTRODUCTION

First: Research Problem

Since 2019, the Iraqi banking sector has witnessed increased investment in core banking systems, automated teller machines, and electronic cards, driven by the Central Bank of Iraq's initiatives to promote electronic payments and the domiciliation of government employees' salaries. However, a question that has not been adequately addressed through empirical research in the Iraqi context is whether this digital investment is reflected in investors' valuation of banks in the financial market, and whether this effect operates through expanding the customer base and increasing financial inclusion. The research problem is formulated through the following questions:

1. What is the statistical significance of the effect of digital transformation on the performance of Iraqi commercial banks in the market?

2. If there is, what effect does digital transformation have on the financial inclusion of these banks?
3. Does financial inclusion have a significant impact on the performance of the markets?
4. Does financial inclusion have a mediating effect between digital transformation and the market performance?

Second: Research Significance

The importance of this study is three fold. The first is its contribution to knowledge in that it works with a mediating pathway between digital transformation and financial inclusion, and market value, which has been little explored in the Iraqi context at the bank-level. The second is methodological because the data used in the study are obtained by manually reading the audited letters of statement from the financial statements, noting the source and page number of each figure and verifying the balance sheet for each observation. The third, of course, is practical: it offers bank management and regulators "proof" of the worth of digital investment from the investor angle.

Third: Research Objectives

1. The purpose of the measurement of digital transformation, financial inclusion and market performance within the sampled banks in the research period was to 1. To measure the levels of digital transformation, financial inclusion and market performance within the sampled banks in the research period.
2. To test the direct effect of digital transformation on market performance.
3. To study the impact of digital transformation on financial inclusion and the impact of financial inclusion on the performance of the market.
4. To assess mediation role of financial inclusion.

Fourth: Research Hypotheses

1. H1: Digital transformation has a positive and statistically significant effect on banks' market performance.
2. H2: Digital transformation has a positive and statistically significant effect on financial inclusion.
3. H3: Financial inclusion has a positive and statistically significant effect on market performance.
4. H4: Financial inclusion mediates the relationship between digital transformation and market performance.

Fifth: Research Population and Sample

The subject of the research are banks listed on regular market of the Iraq Stock Exchange. The sample was selected based on the following requirements: (1) the annual financial statements reported to the Securities Commission are available on the Securities Commission's website and include detailed notes; (2) the closing price of the stock at the end of each year is available; and (3) the stock is continuously listed throughout the research period. In view of this, the sample included ten banks namely: Bank of Baghdad, National Bank of Iraq, Mansour Bank, Ashur International bank, Iraqi Investment bank, Economy bank, Gulf commercial bank, United bank, Trans Iraq bank, and Cihan Islamic bank. There were 77 bank-year observations in the sample, with a market price available for 72 of them during the period (2018–2025).

Sixth: Data Sources

1. Accounting Data: Audited annual financial statements of banks published on the Securities Commission's website. Each year's report was used together with its comparative column to obtain the preceding year's data. Consolidated financial statements were used when subsidiaries were financial entities, while separate financial statements were used when subsidiaries or associates were large non-financial entities (Trans Iraq Bank and Cihan Islamic Bank).
2. Stock Prices: Daily bulletins for the final trading session of each year (Iraqi Depository Center), the 2022 Yearbook of the Iraq Stock Exchange, the 2024 Annual Report of the Securities Commission, and the 2025 Annual Report of the Iraq Stock Exchange.
3. Quality Control: The accounting equation (Assets = Liabilities + Equity) was verified for all observations, with discrepancies not exceeding two units due to rounding. January 2022

prices were also matched against year-end 2021 prices obtained from an independent source.

Seventh: Research Variables and Their Measurement

Table 1. Research Variables and Measurement Methods

Variable	Symbol	Measurement Method	Source
Independent Variable	—	—	—
Digital Transformation	SOFT	Net intangible assets (software and systems) ÷ Total assets ×100	Balance Sheet and Notes
Mediating Variable			
Financial Inclusion	SAVE	Savings deposits ÷ Customer deposits ×100	Customer Deposits Note
Financial Inclusion (Alternative)	RETAIL	Retail credit ÷ Total cash credit ×100	Credit Facilities Note
Dependent Variable			
Market Performance	TQ	(Market value of equity + Total liabilities) ÷ Total assets	Market + Financial Statements
Market Performance (Alternative)	MB	Market value of equity ÷ Shareholders' equity	Market + Financial Statements
Control Variables			
Bank Size	SIZE	Natural logarithm of total assets	Balance Sheet
Financial Leverage	LEV	Total liabilities ÷ Total assets ×100	Balance Sheet
Profitability	ROA	Profit before tax ÷ Total assets ×100	Income Statement
Sanctions	SANC	Dummy variable = 1 for the bank banned from dealing in US dollars (Iraqi Investment Bank since February 2024)	Central Bank
Islamic Bank	ISL	Dummy variable = 1 for Jihan Bank	—

Measurement Notes: (1) Market value would be the value of the closing price at the end of the year multiplied by the number of shares, since the nominal value per share is one Iraqi dinar, and the number of shares is equal to the amount of paid-up capital. (2) Profit before tax is taken to ensure that the banks are consistent. The primary measure, the electronic revenue measure (DIGFEE), was not used as the primary measure because disclosure was available for only 17 observations. As four banks (Economy Bank, Gulf Commercial Bank, United Bank, and Trans Iraq Bank) did not report intangible assets, models that include SOFT were limited to 42 observations and six banks.

Eighth: Econometric Model

The study adopted the methodology of Baron and Kenny [1], supplemented by a test of the indirect effect using bootstrapping [2], through three equations:

1. Model (M1), Total Effect: $MP_{it} = \alpha_i + c\,SOFT_{it} + \gamma' X_{it} + \varepsilon_{it}$
2. Model (M2), Path (a): $SAVE_{it} = \alpha_i + a\,SOFT_{it} + \gamma' X_{it} + u_{it}$
3. Model (M3), Paths (b) and (c′): $MP_{it} = \alpha_i + c'\,SOFT_{it} + b\,SAVE_{it} + \gamma' X_{it} + e_{it}$

Where $\alpha_i$represents the bank fixed effect, and X_{it} denotes the vector of control variables. The indirect effect is equal to $a \times b$, and its 95% confidence interval is constructed using cluster bootstrapping at the bank level (3,000 replications), with within-bank bootstrapping used as a supplementary test.

Ninth: Estimation Method

After comparing with pooled regression that is tested with the F-test for bank effects and Hausman test [3] for the random-effects model, the models were estimated using the fixed-effects method (Within Estimator). Heteroskedasticity and serial correlation were accounted for

by using cluster-robust standard errors at the bank level, where the degrees of freedom are (G-1). Such a conservative strategy is suitable based on the small number of banks [4].

METHOD

Section Two: Theoretical Framework

First: Digital Transformation in Banks

The particular use of digital technology, such as core banking systems, electronic channels, cards and payments via mobile devices, to redefine processes and provide services in banks is called digital transformation in banks. Technological investments are expected to lower transaction costs, increase the service area and increase the quality of information. In recent times, the competition between banks and fintech firms, and the effect of this competition on the business model of banks, have been studied [5]. Recent studies indicated that Financial technology innovation enhances bank efficiency [6], financial digital transformation is linked with income diversification and banking stability [7] and financial digital transformation improves financial performance in emerging markets [8], [9].

Second: Financial Inclusion

Financial inclusion is defined as individuals' and businesses' access to formal financial services and their use of these services at an affordable cost. The Global Findex Database indicates that digital payments have become the primary channel for expanding financial inclusion following the COVID-19 pandemic [10]. At the national level, financial inclusion is measured using access and usage indicators, while at the bank level, it is measured using indicators such as the share of individual deposits and credit. Recent literature indicates that the spread of financial technology expands financial inclusion [11], digital financial inclusion enhances bank stability [12], and financial inclusion is associated with improved bank performance in the Middle East and North Africa [13].

Third: Market Performance

The present value of a bank's future cash flows is what investors value, and this is reflected by market performance. It is usually determined by Tobin's Q, which is the ratio of a company's market value to book value of its assets [14]. If the ratio is greater than 1, then the value of the bank on the market is greater than the replacement cost of its assets, typically due to intangible assets or growth prospects.

Fourth: Relationship Between the Variables

The impact of digital transformation on the market value is anticipated to occur in two ways: direct pathway – via lower cost, higher efficiency and better growth expectations; and indirect pathway – via larger customer base and individual savings at lower costs (financial inclusion). This, in turn, improves funding stability and profitability of the bank which boosts its market value.

Fifth: Recent Previous Studies

First: Studies in the Iraqi Context

1. Ibrahim and Ali [15]: This study examined the impact of digital methods on financial inclusion in Iraqi banks through a questionnaire administered to 144 employees in several banks in Baghdad. The study employed a logistic model and found that 75% of respondents preferred combining digital and traditional methods.
2. Mohammed and Kazem [16]: This study examined the effect of financial inclusion, measured by the number of electronic payment transactions, on the financial performance efficiency of the Iraqi banking sector during the period (2015–2024). It found a positive and statistically significant effect on profitability, but no statistically significant effect on capital adequacy.
3. Raheef and Ibrahim [17]: This study investigated the impact of banking digital capabilities on intelligent financial management in three private commercial banks (Ashur, Gulf Commercial, and International Development). It found a positive and statistically significant effect, with intelligent risk management and digital infrastructure having the greatest influence.

Second: Arab and Regional Studies

4. Shihadeh [13]: This study examined the impact of financial inclusion on bank performance and risk in the Middle East and North Africa, Pakistan, and Afghanistan. It concluded that financial inclusion improves performance and reduces risk.

5. Theiri and Hadoussa [9]: This study examined 12 Tunisian banks over the period (2010–2020) using the generalized least squares method. It found that digital transformation improves return on assets and return on equity, particularly through investment in payment instruments, digital channels, and internet security.

Third: Recent International Studies

6. Do et al. [8]: This study found that digital transformation affects the performance of Vietnamese commercial banks.

7. Bui and Duong [18]: This study examined 18 Vietnamese commercial banks over the period (2015–2022), using the generalized method of moments and text analysis of annual reports. It concluded that banks integrating digital transformation into their strategies achieve better financial performance.

8. Saktiawan et al. [19]: This study measured digital transformation by the number of digital products and services offered by Indonesian banks over the period (2014–2023). It found that digital transformation improves performance, with the effect concentrated in non-state-owned, small, and medium-sized banks.

9. Banna and Alam [12]: This study examined 213 banks in four ASEAN countries and found that digital financial inclusion enhances banking stability and reduces the risk of default.

Positioning of the Current Study: Previous Iraqi studies have generally relied on questionnaires or aggregate indicators of the banking sector. In contrast, the current study relies on data manually extracted from audited financial statements at the individual bank level, measures performance using market-based indicators (Tobin's Q and the market-to-book ratio) rather than accounting-based measures, and tests the mediating role of financial inclusion using bootstrapping. This approach has not been addressed by previous studies in the Iraqi context.

RESULT AND DISCUSSION

Section Three: Empirical Analysis

First: Descriptive Statistics

Table 2. Descriptive Statistics of the Research Variables

Variable	Observations (N)	Mean	Standard Deviation	Minimum	Maximum
TQ	72	0.832	0.277	0.460	1.583
MB	72	0.722	0.696	0.059	2.598
SOFT (%)	45	0.360	0.549	0.000	2.953
SAVE (%)	75	25.007	18.432	2.898	67.639
SIZE	77	27.436	0.662	26.515	29.505
LEV (%)	77	55.912	17.340	16.468	87.319
ROA (%)	76	1.628	2.408	−3.258	10.258

Table (2) shows that the mean of Tobin's Q is 0.832 which is less than one, suggesting that, on average, the market does not value Iraqi banks at the book value of their assets. This is confirmed by the mean market-to-book ratio of 0.722. This is a sign of investors' mistrust of the private banking system in the face of uncertainty surrounding some of the banks and exchange rates. There is also significant variation between the banks in the indicator, with values from 0.46 to 1.58. Digital transformation was still limited, with the average rate of software and systems to total assets up to 0.36%, with the highest being in 2025 for the National Bank of Iraq at 2.95%. The average holding of savings deposits accounted for 25% of the total share of customer deposits, with current account deposits (mainly held by companies) making up the bulk of the structure.

Second: Correlation Matrix and Multicollinearity Test

Table 3. Pearson Correlation Coefficients (Main Sample, n = 42)

	TQ	MB	SOFT	SAVE	SIZE	LEV	ROA
TQ	1						
MB	***0.93	1					

	TQ	MB	SOFT	SAVE	SIZE	LEV	ROA
SOFT	**0.33	***0.41	1				
SAVE	0.10	0.02−	0.13−	1			
SIZE	***0.44	***0.58	*0.27	**0.34−	1		
LEV	**0.37	**0.37	0.12	0.21−	***0.72	1	
ROA	*0.30	***0.47	0.01−	***0.43−	***0.67	***0.41	1

*** Significant at the 1% level, ** at the 5% level, and * at the 10% level.

The results of this study indicate that the digital transformation is significantly correlated with both market performance indicators and has positive results with coefficients of 0.33 for TQ and 0.41 for MB (Table 3). But, there is no correlation between digital transformation and financial inclusion (–0.13, insignificant) and financial inclusion and market performance (–0.36, insignificant). The Variance Inflation Factor (VIF) values were also calculated and found to be between 1.09 and 3.74, which is not more than the acceptable level of 10, suggesting there was no multicollinearity problem.

Third: Diagnostic Tests and Model Selection

Table 4. Diagnostic Tests (Dependent Variable: TQ)

Test	M1	M2	M3	Decision
F-test for Bank Effects (Pooled vs. Fixed)	35.92 (0.000)	23.23 (0.000)	28.56 (0.000)	Fixed Effects is preferred over Pooled
Hausman Test (Fixed vs. Random)	—	—	15.77 (0.015)	Fixed Effects
Modified Wald Test for Heteroskedasticity	87.3 (0.000)	13.9 (0.031)	70.7 (0.000)	Heteroskedasticity exists
Wooldridge Test for Autocorrelation	372.9 (0.000)	23.6 (0.005)	382.9 (0.000)	Autocorrelation exists

The values in parentheses represent p-values.

The results in Table (4) suggest that the fixed-effects model is chosen rather than the random-effects model and pooled regression. The results also show heteroskedasticity and autocorrelation. All models were therefore estimated with clustered standard errors at the bank level to correct for these two problems.

Fourth: Model Estimation Results

Table 5. Results of the Fixed-Effects Models (Dependent Variable: Market Performance, TQ)

Variable	M1: TQ (Total Effect)	M2: SAVE (Path a)	M3: TQ (Paths b & c')
SOFT	0.158* (0.084)	3.915** (0.015)	0.156* (0.099)
SAVE	—	—	0.0006 (0.855)
SIZE	−0.236* (0.059)	−8.646* (0.080)	−0.230* (0.072)
LEV	0.016*** (0.000)	0.250** (0.020)	0.016*** (0.000)
ROA	0.059** (0.012)	−0.899 (0.460)	0.060** (0.011)
SANC	0.106*** (0.007)	−10.556*** (0.001)	0.112** (0.030)
R^2 (within)	0.772	0.481	0.772
Observations / Banks	42 / 6	42 / 6	42 / 6

The values in parentheses are p-values based on standard errors clustered at the bank level.

Table 6. Results of the Fixed-Effects Models (Dependent Variable: Market Performance, MB)

Variable	M1: MB	M3: MB
SOFT	0.514*** (0.008)	0.495** (0.017)
SAVE	—	0.0048 (0.753)
SIZE	−0.321 (0.389)	−0.280 (0.485)

Variable	M1: MB	M3: MB
LEV	0.033** (0.041)	0.032** (0.048)
ROA	0.187** (0.021)	0.192** (0.016)
SANC	0.387** (0.028)	0.438** (0.048)
R^2 (within)	0.749	0.751

Fifth: Testing the Indirect Effect

Table 7. Results of the Mediation Test Using the Bootstrapping Method

Dependent Variable	a	b	Indirect Effect (a×b)	95% CI (Cluster Bootstrap)	95% CI (Within-Bank Bootstrap)	Decision
TQ	3.915	0.0006	0.0023	[−0.020, 0.025]	[−0.037, 0.057]	No mediation
MB	3.915	0.0048	0.0187	[−0.073, 0.232]	[−0.130, 0.178]	No mediation

All confidence intervals include zero; therefore, the indirect effect is insignificant, and financial inclusion does not mediate the relationship between digital transformation and market performance.

Sixth: Robustness Tests

Table 8. Robustness Tests (Fixed-Effects Coefficients and p-values)

Test	SOFT → TQ	SOFT → MB	SOFT → SAVE (a)	SAVE → TQ	n
Excluding Al-Ahli 2025 (Outlier)	0.242** (0.050)	0.357 (0.347)	−0.949 (0.874)	0.001 (0.722)	41
Excluding the Islamic Bank (Cihan)	0.049** (0.014)	0.168** (0.033)	1.515 (0.342)	−0.002 (0.511)	34
Period Before Broad Sanctions (2018–2023)	0.255** (0.039)	0.294 (0.374)	−0.757 (0.809)	0.003 (0.497)	30
Alternative Mediator: Retail Credit (RETAIL)	0.050** (0.024)	0.176* (0.067)	−1.618 (0.149)	0.001 (0.578)	23
Larger Sample Without SOFT: SAVE → TQ	—	—	—	0.0054* (0.077)	69
Larger Sample Without SOFT: SAVE → MB	—	—	—	0.0158* (0.052)	69

The robustness tests confirm that the effect of digital transformation on Tobin's Q remained positive and significant across all tests, whereas its effect on MB was sensitive to the sample composition. In contrast, the significance of path (a) in the full sample was driven by a single observation, namely Al Ahli Bank of Iraq in 2025, when its intangible assets increased to IQD 192 billion. The significance disappeared when this observation was excluded. Financial inclusion was not significant in any of the models restricted to the SOFT sample; however, it exhibited a weak positive effect (at the 10% significance level) in the larger sample (69 observations).

Seventh: Results of Hypothesis Testing

Table 9. Summary of Hypothesis Testing Results

Hypothesis	Result	Evidence
H1: Digital Transformation Market Performance	Accepted	Significant in M1 and M3 for both measures, and robust across robustness tests for TQ
H2: Digital Transformation Financial Inclusion	Rejected	Significance is not robust and disappears when excluding a single outlier observation

Hypothesis	Result	Evidence
H3: Financial Inclusion Market Performance	Partially Accepted	Insignificant in the restricted sample, but significant at 10% in the larger sample
H4: Mediating Role of Financial Inclusion	Rejected	Confidence intervals for the indirect effect contain zero using both bootstrapping methods

Section Four: Discussion of the Results

First: The Direct Effect of Digital Transformation

The positive impact of digital transformation on market value aligns with the results of other studies on banking performance in other contexts [8], [9], [18], and also with the results of Mohammed and Kazem [16] which found that electronic payment had a positive impact on the profitability of the Iraqi banking sector. This means that investors in the Iraq Stock Exchange consider investing in digital systems as a criterion to evaluate the competitiveness and compliance of banks. This is in connection with the context of the current period, where the Central Bank of Iraq connected some banking operations (electronic payment, salary domiciliation and the platform for external transfers) to the technological readiness of the banks. Now digital investment has become a compulsory requirement for staying in the market and is no longer just an advantage.

Second: The Absence of the Mediating Role of Financial Inclusion

The rejection of the mediation hypothesis is a very important result. It suggests that investment in digital banking has not yet led to an increase in people's savings and credit in Iraqi banks. This can be attributed to the following reasons:

1. Regulatory factors, such as the needs of the Central Bank (salary domiciliation, integration with payment systems, anti-money laundering systems), were the main drivers of digital investment, and not the attractiveness of small depositors for their marketing strategy.
2. Low confidence in the private banking sector: confidence in private banks is lower in Iraq, as people still prefer to carry cash or deal with the state-owned banks which reduces the amount of savings deposits that can be done via digital services.
3. Deposit structure: Current accounts of companies are predominant in the deposits of private banks, especially of those that were previously related with the currency auction activities. This means that the ratio of saving deposits to total savings is not influenced by digitalization.
4. Measurement constraints: The savings ratio is not necessarily an indicator of financial inclusion, as there are other indicators, including the number of accounts and digital users, which banks do not report on regularly.

Third: Control Variables

The coefficient for profitability was positive and significant and, as expected, the coefficient for leverage was also positive. This can be understood because banks that have a higher ratio of deposit to equity (higher intermediation activity) are given a higher valuation in the market because there are many banks in the market that have idle capital. While the positive coefficient on the sanctions variable in the model is consistent in a single bank, in which equity and book value of assets fell faster than the bank's share price, this is not always the case. This discovery should not be applied to a broader population.

CONCLUSION

First: Conclusions

1. The market performance of the Iraqi commercial banks in terms of Tobin's Q is positively and significantly affected by digital transformation. This effect holds true among various robustness tests.
2. No strong relationship between digital transformation and the % of savings deposits or individual credit was found.
3. The relationship between digital transformation and market performance in the Iraqi

context during the research period is not mediated by financial inclusion in the study period.
4. Market valuations of Iraqi banks are, on average, lower than the value of their assets and there is significant variation between banks.
5. The disclosure of indicators of digital transformation by the Iraqi banks is clearly limited, as 4 out of 10 banks did not separately disclose their intangible assets.

Second: Recommendations

1. For the Central Bank of Iraq: Mandate banks to include in notes to their financial statements specific digital indicators such as technological assets, digital users, electronic service revenues, ATM and point of sale numbers.
2. Expand Bank Management: Align digital investment with measurable financial inclusion goals (as opposed to compliance goals only) such as digital savings accounts, small-scale financial savings products, etc.
3. In Securities Commission: Include digital transformation KPIs in the periodic disclosure of listed banks in order to enhance banking pricing efficiency.
4. Researchers: Build up the sample according to financial inclusion disclosure, conduct an alternative assessment of financial inclusion based on number of accounts and users, and explore the impact of digital transformation on state-owned banks.

Third: Research Limitations

1. The findings are limited in generalizability as only 6 banks were included in the models that included the digital transformation measure because disclosure was not sufficient.
2. The main models had 6 clusters (banks) in them. In this situation the cluster-robust standard errors are conservative and the 10% level of statistical significance should be treated with some caution.
3. Accounting treatment of software is related to digital transformation measure. These costs may be capitalized by some banks and expensed by others, which may have an impact on the comparability of the banks.

REFERENCES

[1] R. M. Baron and D. A. Kenny, "The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations," J. Pers. Soc. Psychol., vol. 51, no. 6, pp. 1173–1182, 1986, doi: 10.1037/0022-3514.51.6.1173.

[2] A. F. Hayes, Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach, 3rd ed. New York, NY, USA: Guilford Press, 2022.

[3] J. A. Hausman, "Specification tests in econometrics," Econometrica, vol. 46, no. 6, pp. 1251–1271, 1978, doi: 10.2307/1913827.

[4] M. A. Petersen, "Estimating standard errors in finance panel data sets: Comparing approaches," Rev. Financ. Stud., vol. 22, no. 1, pp. 435–480, 2009, doi: 10.1093/rfs/hhn053.

[5] A. V. Thakor, "Fintech and banking: What do we know?" J. Financ. Intermediation, vol. 41, Art. no. 100833, 2020, doi: 10.1016/j.jfi.2019.100833.

[6] C.-C. Lee, X. Li, C.-H. Yu, and J. Zhao, "Does fintech innovation improve bank efficiency? Evidence from China's banking industry," Int. Rev. Econ. Finance, vol. 74, pp. 468–483, 2021. Available: https://ideas.repec.org/a/eee/reveco/v74y2021icp468-483.html

[7] M. A. Khattak, M. Ali, W. Azmi, and S. A. R. Rizvi, "Digital transformation, diversification and stability: What do we know about banks?" Econ. Anal. Policy, vol. 78, pp. 122–132, 2023. Available: https://ideas.repec.org/a/eee/ecanpo/v78y2023icp122-132.html

[8] T. D. Do, H. A. T. Pham, E. I. Thalassinos, and H. A. Le, "The impact of digital transformation on performance: Evidence from Vietnamese commercial banks," J. Risk Financ. Manag., vol. 15, no. 1, Art. no. 21, 2022, doi: 10.3390/jrfm15010021.

[9] S. Theiri and S. Hadoussa, "Digitization effects on banks' financial performance: The case of an African country," Competitiveness Rev., vol. 34, no. 1, pp. 144–162, 2024, doi: 10.1108/CR-10-2022-0147.

[10] A. Demirgüç-Kunt, L. Klapper, D. Singer, and S. Ansar, The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. Washington, DC, USA: World Bank, 2022, doi: 10.1596/978-1-4648-1897-4.
[11] D. Kanga, C. Oughton, L. Harris, and V. Murinde, "The diffusion of fintech, financial inclusion and income per capita," Eur. J. Finance, vol. 28, no. 1, pp. 108–136, 2022. Available: https://ideas.repec.org/a/taf/eurjfi/v28y2022i1p108-136.html
[12] H. Banna and M. R. Alam, "Impact of digital financial inclusion on ASEAN banking stability: Implications for the post-Covid-19 era," Stud. Econ. Finance, vol. 38, no. 2, pp. 504–523, 2021, doi: 10.1108/SEF-09-2020-0388.
[13] F. Shihadeh, "The influence of financial inclusion on banks' performance and risk: New evidence from MENAP," Banks Bank Syst., vol. 15, no. 1, pp. 59–71, 2020. Available: https://businessperspectives.org/journals/banks-and-bank-systems/issue-344/the-influence-of-financial-inclusion-on-banks-performance-and-risk-new-evidence-from-menap
[14] J. Tobin, "A general equilibrium approach to monetary theory," J. Money Credit Bank., vol. 1, no. 1, pp. 15–29, 1969, doi: 10.2307/1991374.
[15] L. K. Ibrahim and S. O. Ali, "Digital tools and their impact on financial inclusion in Iraqi banks," J. Accounting Financ. Stud., vol. 19, Special Issue, pp. 1010–1024, 2024, doi: 10.34093/5epnhv23.
[16] A. T. M. Mohammed and F. F. K. Kazem, "The impact of financial inclusion on the efficiency of financial performance," Sulaimani J. Humanities, pp. 90–98, 2025, doi: 10.17656/12029.
[17] B. H. Rahif and L. K. Ibrahim, "Banking digital capabilities and their impact on enhancing smart financial management: An applied study of a sample of Iraqi commercial banks," J. Accounting Financ. Stud., vol. 21, no. 74, pp. 486–497, 2026. Available: https://www.jpgiafs.uobaghdad.edu.iq/index.php/JAFS/article/download/2514/1577/3680
[18] T. H. Bui and Y. T. Duong, "The impact of digital transformation strategy on the performance of commercial banks: Evidence from an emerging economy," Econ. Finance Lett., vol. 12, no. 1, pp. 86–97, 2025, doi: 10.18488/29.v12i1.4098.
[19] B. Saktiawan, R. Dewi, T. Risfandy, and B. Setiyono, "Banking in the digital era: Charting the path from transformation to performance in Indonesian banks," Etikonomi, vol. 25, no. 1, 2026, doi: 10.15408/etk.v25i1.43624.

Data Sources

- Audited annual financial statements of the sampled banks (2019–2025).
- Iraqi Securities Commission. https://isc.gov.iq
- Daily bulletins of the Iraq Stock Exchange.
- Iraqi Depository Center. https://csd.gov.iq
- Iraq Stock Exchange Annual Report 2022.
- Iraqi Securities Commission Annual Report 2024.
- Iraq Stock Exchange Annual Report 2025.