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The Impact of Digital Payment Indicators on the Financial Assessment of the Iraqi Banking Sector

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Abstract: This study aims to measure the impact of digital payment indicators—specifically the Real-Time Gross Settlement (RTGS) system and the Interbank Retail Payment System (IRPSI)—on the financial performance of Iraqi commercial banks, as assessed through profitability and liquidity ratios, for the period 2018–2024. The research problem lies in questioning the extent to which these systems have succeeded in transcending their operational role to become an actual driver of improved financial performance, or whether they remain merely an alternative technical channel for executing transactions without structural impact. To answer this, the study adopted a descriptive-analytical approach and the Autoregressive Distributed Lag (ARDL) model.

The results showed a positive and significant effect of retail payment systems (IRPSI) on profitability indicators, reflecting their effectiveness in maximizing operating returns, while no significant long-term effect of these systems was found on liquidity levels, indicating that they are subject to independent managerial and monetary policies. The analysis also revealed instability in the equilibrium relationship of short-term liquidity (LASTL) over the long term, despite the presence of a short-term correction mechanism (40%) that confirms banks' ability to restore profitability equilibrium after adopting digital technologies. The study concluded that these platforms currently serve as a modern tool to facilitate transactions for existing investors but have not yet succeeded in attracting high financial solvency that contributes to the development of the market's structural size.

Keywords: (Digital payment, , financial evaluation, ARDL model) .

1. Introduction:

The ongoing development, the accelerating pace of innovation, and the impact of technological progress on all industrial, commercial, and economic sectors have had a profound effect on the banking sector. Additionally, changes in customer nature and behavior, along with other factors, have led to a radical transformation in the banking sector Digital banking services have made significant strides through mobile banking applications, competitive interest rates, low fees, and rewards programs Digital transformation in the banking sector aims to improve the quality of banking services in the long term and provide faster, better, and more efficient service It should be noted that Iraqi society is highly diverse and suffers from significant social and economic disparities, which have been reflected in the adoption of digital payment practices

The financial assessment of the banking sector, which relies primarily on standard financial ratio frameworks, shows that evidence and numerous studies indicate performance variations across regions and types of banks (Mengistu, 2015:2). Financial assessment is a systematic, multi-criteria process aimed at determining the financial soundness, operational efficiency, level of risk exposure, and long-term viability of banks (Rose, 2013:168).

The research problem centers on understanding this relationship in light of the digital transformations occurring in the financial system, as the expansion of electronic payment systems can enhance the efficiency of banking operations, improve liquidity management, and increase the volume of financial transactions within the banking sector—which, in turn, may be reflected in banks' financial assessment indicators. The research problem lies in **determining to what extent digital payment indicators have influenced the financial performance indicators of the Iraqi banking sector during the period (2018–2024).**

This study gains significance considering the digital transformations taking place in the financial and banking system, as it can clarify the role that digital payment systems can play in improving the efficiency of banking operations and enhancing financial stability by analyzing their impact on the financial performance indicators of banks. The study also represents a scientific attempt to link developments in the infrastructure of digital payment systems to financial performance indicators of the Iraqi banking sector, an area that still requires further applied studies based on real-world data and modern statistical analysis methods.

The study also aims to bridge the gap between the study variables by analyzing the relationship between digital payment indicators and financial performance indicators of the Iraqi banking sector, measuring their impact, and determining the extent of a long-term relationship between the study indicators using statistical analysis models.

The study is based on the following two hypotheses

H1: There is no statistically significant effect of the retail payment system activity (IRPSI) on the financial performance indicators of the Iraqi banking sector.

H2: There is no statistically significant effect of Real-Time Gross Settlement (RTGS) system activity on the indicators used to assess the financial performance of the Iraqi banking sector.

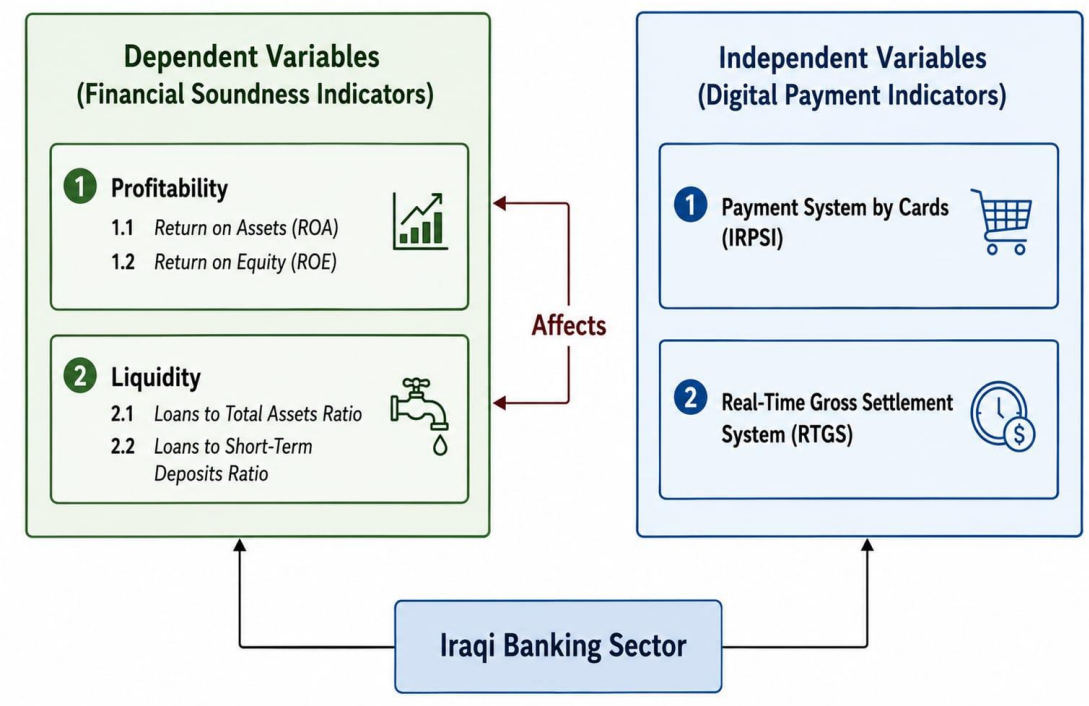

Figure (1) Hypothetical study plan

Source: prepared by the researcher

Table 1. Measurement of variables

Variable's code	Items	source
MM - IV	**3**	(Steuer, 1992) (Chen et. al., 2009)
• **Perception**	**3**	
• **Interactivity**	**3**	
• **Interest**	**3**	
CPI- DV	**6**	(Pavlou & Fygonson, 2006) (Mujtaba & Mubarik, 2022)

Source: By authors based on literature

Firstly :The Concept of Digital Payments

Today, the banking sector is undergoing a shift from reliance on traditional branches to the use of information technology and big data, alongside highly specialized human capital. Even before this shift began, banks and markets were intertwined, with a larger proportion of brokerage activities becoming market-based, and banks facing increasing competition from other brokerage entities. Banks are increasingly moving toward digitalization in their core operations, such as payment services and advisory services. The fintech sector—defined as the use of innovative information technology and automation in financial services—has witnessed a notable shift toward the adoption of various new digital technologies and the acquisition of associated users. Many banking studies rely on digital payment systems as quantitative indicators to measure the development of electronic payment activity, as they provide accurate data on the number and values of financial transactions, making them suitable for financial and applied analysis (Cornelli et al., 2020:45).

Since the advent of the Internet, people have increasingly relied on digital communications and other network technologies for tasks ranging from simple online information browsing to more important and sensitive tasks, such as financial transactions. This reliance has translated into a growing focus on the strategic importance of cyberspace for enabling the achievement of fundamental goals in contemporary societies: innovation, collaboration, productivity, competitiveness, and leadership, (Lagazio et al., 2014:1).

Digital payments, particularly via mobile phones, have also significantly expanded access to formal financial services for the unbanked and those with insufficient banking services. Studies conducted by (Suri & Jack, 2016: 1292) have shown that the launch of the M-Pesa service in Kenya led to a significant reduction in poverty rates, particularly for female-headed households, by lowering transaction costs and enabling savings and risk-sharing, relative to banks. This opens the door to new market segments that were previously underserved, although it requires innovative, low-cost business models (Al-Karaawi & Al-hadrawi, 2025:105).

The availability of cashless payment tools has changed consumer behavior and how people pay or manage their money. In addition to traditional methods such as credit or debit cards, smartphones provide consumers with access to digital payment technologies such as e-wallets and e-money. According to the GSMA Mobile Economic Report, the number of unique mobile subscribers worldwide stands at 5.1 billion, or 67 percent of the global population. By 2025, this figure is expected to reach 5.8 billion, of which 5 billion will also be mobile internet subscriptions. These new digital payment solutions threaten cash and card transactions (Bilotta & Botti, 2021:16).

Processing digital payment flows is much less costly than manual paper-based processing, as automation reduces labor costs, errors, and fraud. A study conducted by (Beck et al., 2007:22) that there is a positive relationship between the efficiency of a country's payment systems and the profitability of its banking sector. Real-time payment systems also reduce settlement times, freeing up liquidity and improving working capital management for both banks and their corporate clients.

Cash is often viewed in public discourse and recent literature as a key factor in tax evasion and a symbol of the shadow economy. This view has spurred policies that encourage digital payments and restrict the use of cash; however, these measures are sometimes viewed as overly controlling, causing public resistance and slowing the

adoption of digital tools. As digitization accelerates, the debate over cash versus digital payments intensifies. While digital options expand, cash remains an essential element for some (Mastac, 2025:190).

Digital payment methods are currently among the most widespread, enabling individuals to easily conduct financial transactions by transferring funds from one account to another using electronic means without the need for cash or paper checks. This type of payment relies on a digital intermediary that connects the payer and the payee, which helps streamline financial operations, making them faster, more accurate, and more secure (Lawrence, 2025:1).

(Dahlberg et al., 2008:1) defines digital payment as the process of paying for goods, services, and bills using digital tools and systems that leverage wireless communication technologies and others. Meanwhile, (Arsyianto et al. 2025:312) define digital payments as a set of tools and infrastructure that enable the digital transfer of funds via digital devices, ranging from card payments, e-wallets, and mobile payments to QR code-based platforms

We define digital payments as a fundamental infrastructure of the modern economy that influences the financial behavior of banks by transforming money from paper-based to fully digital. Digital payments represent financial transactions conducted through digital technology, tools, and systems.

Secondly: The Importance of Digital Payments

The world is currently witnessing numerous modern developments and changes on the international stage, and among the most significant of these changes is the technological revolution, which is one of the defining features of the modern era. It has impacted various scientific, social, cultural, and economic aspects, particularly the banking sector, and is used to facilitate transactions and other tasks. The importance of digital payments can be illustrated as described in (Klapper & Singer, 2017:16) and (Kadem et al., 2020:25). Through the following points and Figure (1) below:

1. **Enhanced Security and Reduced Risk:** Digital payments help reduce theft, loss, and fraud, minimize the use of counterfeit currency, and provide advanced security technologies such as encryption and electronic authentication.
2. **Speed and efficiency in processing transactions:** It facilitates the execution of financial transactions quickly and with high accuracy without the need to travel or use traditional payment methods, saving time and effort.
3. **Reduced operational costs:** It helps reduce the expenses banks incur because of settling traditional transactions and promotes the use of information technology and intellectual capital.
4. **Enhanced transparency and improved banking services:** It provides a high level of transparency through electronic transaction recording and contributes to the automation of banking processes, improving flexibility and responsiveness of services to customer needs.
5. **Supporting financial inclusion and economic activity:** It helps expand access to financial services such as accounts, loans, and insurance, promotes investment, and creates job opportunities, with the ability to access funds anytime and anywhere.

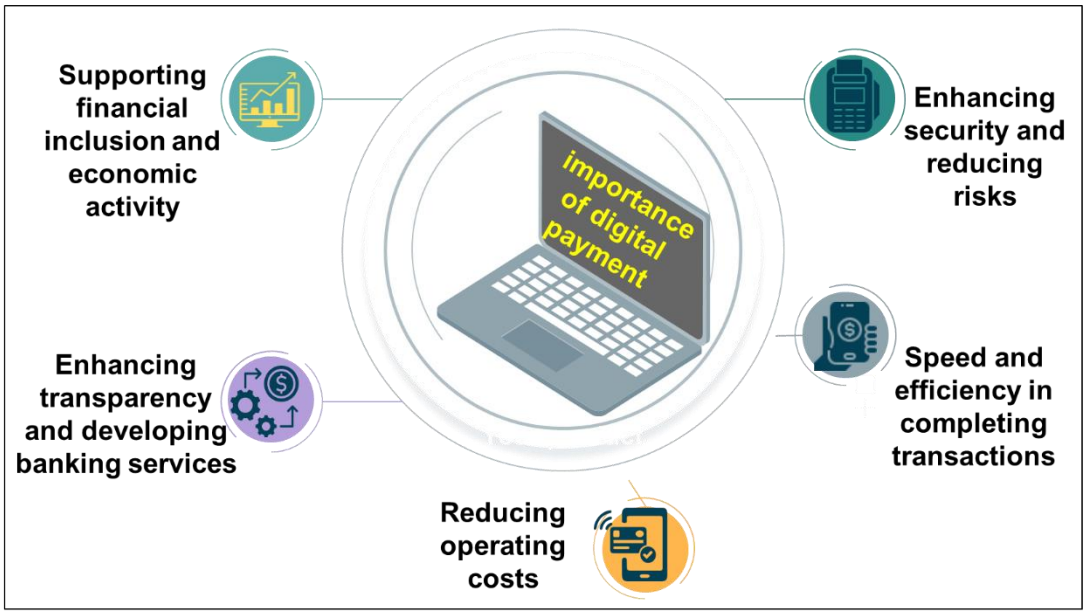

Figure (1) The Importance of Digital Payments

The source: was prepared by the researcher

First: The Concept of Financial Evaluation:

The concept of financial valuation is established in financial and banking literature as a comprehensive analytical framework used to understand the financial performance of institutions and interpret their financial behavior, rather than merely a computational process based on deriving isolated financial ratios. This concept has evolved as a product of accumulated knowledge linked to the development of financial analysis and the complexity of financial systems, making it an interpretive analytical tool concerned with diagnosing the financial situation and measuring the efficiency of performance and the soundness of an institution's financial position considering its objectives and the nature of its activities. (Financial evaluation is based on analyzing the interactive relationships between the various items in the financial statements, allowing for the formation of a comprehensive view that reflects the institution's ability to achieve a balance among the fundamental dimensions of financial performance. This assessment is not limited to measuring apparent financial results but extends to analyzing the institution's ability to achieve profitability, maintain liquidity, ensure capital adequacy, and support business growth through the systematic linking of various financial indicators and their interpretation within their economic and financial context (Palepu et al., 2025:38-41). In the banking sector in particular, financial evaluation takes on exceptional importance given the nature of banking activity, which is based on financial intermediation and the associated intertwined risks—credit, liquidity, capital, and operational— (Abbas et al., 2020:343). Financial assessment is considered the primary tool for judging a bank's ability to meet its obligations, strike a balance between profitability and risk management requirements, and comply with regulatory requirements, thereby ensuring financial soundness and the sustainability of banking activities, (International Monetary Fund. Statistics Dept., 2019:4).

Financial assessment is also viewed as a pivotal tool for supporting decision-making processes at multiple levels, as bank management relies on it to evaluate financial and strategic policies, and regulators use it in their supervisory and monitoring activities (Mohmmed et al., 2020:324) , and investors and stakeholders rely on it to assess the soundness of banks' financial positions. The literature confirms that the effectiveness of financial assessment is enhanced when it is based on indicators that reflect the essential aspects of actual financial performance and are consistent with the nature of the operational and economic environment in which banks operate (BCBS, 2018:8).

Although the scope of financial evaluation has expanded in some recent literature to take into account multiple dimensions beyond reliance on simple financial ratios, particularly with the evolution of the business environment and the growing interest in multidimensional evaluation approaches, the basic financial indicators derived from financial statements still form the foundation upon which most financial evaluation models are based, particularly in applied studies aimed at analyzing financial performance and measuring changes in it over time. The applied literature confirms that accounting financial ratios, such as profitability, liquidity, and solvency indicators, remain essential tools in evaluating the financial performance of banks, as they provide clear quantitative information reflecting the true financial position of banking institutions and are among the most widely used methods in applied research (Adam, 2014:163).

(Podviezko, 2014:2) defines financial assessment as a process based on a set of criteria to evaluate a bank's ability to maintain a sound capital structure over a specific period. Meanwhile, (Isenberg et al., 2022:64) the process that helps banks assess risks, which contributes to reducing the likelihood of failure and mitigating uncertainty regarding the achievement of required financial performance, and strengthening the bank's risk management procedures; furthermore, the absence of sound assessment coupled with inadequate risk management methods may lead to a crisis in banks.

We define the financial assessment of banks as a comprehensive evaluation of a bank's ability to conduct profitable operations while meeting all its obligations and regulatory requirements, using quantitative financial indicators, qualitative business characteristics, and analytical tools.

Factors Affecting the Evaluation of Banks' Financial Performance

There are several factors that influence the assessment of banks' financial performance, some of which are outlined below:

1. **Internal factors:** Internal factors refer to the characteristics of banks and their management decisions that directly affect financial performance indicators, such as return on assets (ROA), return on equity (ROE), and net interest margin (NIM). Capital adequacy is considered one of the key internal determinants, (Athanasoglou et al., 2008:13)**.** These factors will also enable banks to determine the effectiveness of their management decisions and objectives and their long-term sustainability, chart their course, and make necessary changes when appropriate. A bank must also be efficient, i.e., capable of generating revenue from its assets and achieving profits and must be able to manage its profits to overcome the various risks associated with them and be able to improve its results through its operational approach. (Yakubu & Egopija, 2020:40)

2. **External factors:** Operating in a high-risk environment may lead banks to refrain from expanding their lending, which in turn leads to stagnant debt ratios (Awanda et al., 2024:1795). Risks can arise from various sources, such as operational, financial, and legal risks. Market risk is defined as the degree of volatility or price fluctuation in the markets such as stocks, bonds, or currencies—over a specific period (Gao et al,2022:15) By adopting a strategic, risk-aware approach to investment decision-making that aligns with social and governance standards, banks can ensure their financial sustainability and resilience in an increasingly complex business environment (Li, F., 2011:5). The impact of inflation on the banking sector's performance is a highly significant and complex issue. Its importance lies in the fact that it is a primary concern for investors, shareholders, and lenders, as well as managers, when planning their efficiency-enhancement programs. Inflation distorts the functioning of the price mechanism and leads to inefficient resource allocation. Among the most significant costs of inflation and its impact on the banking sector's performance is uncertainty regarding future inflation rates, which affects future prices due to numerous factors that are difficult to measure because they cannot be directly observed (Kumar et al., 2017:837) . Furthermore, banks facing less competition in deposit markets offer long-term loans, which is attributed to the strength of the deposit market that mitigates the funding risks associated with long-term loans (L. Li et al., 2023:17). The results show that increased competition may be a factor in financial stability in many countries; however, in times of crisis, regulators should pay greater attention to stimulating competition and strengthening appropriate financial regulation and supervision to avoid financial turmoil (Cgpraru & Andrie, 2015:1146).
3. **Technological factors:** Fintech companies have revolutionized the financial sector by changing the way customers' financial needs are met using emerging technologies such as artificial intelligence, robotic process automation, natural language processing, facial recognition, data analytics, and others (Al-Karaawi, 2026:35) , As

these platforms become increasingly accessible online, cyber threats targeting their systems have grown rapidly, Therefore, it has become essential for fintech companies, banks, and financial institutions offering digital solutions to build a well-organized digital infrastructure that prioritizes flexibility, performance, and security, in order to ensure success in the highly competitive digital finance environment (Jayalath & Premaratne, 2021:128) , This wave of innovation also poses complex challenges, as financial institutions must navigate the complexities of integrating new technologies into their existing infrastructure, counter sophisticated cyber threats, and comply with an increasingly complex regulatory environment, (W. Li & Ding, 2024:109) . The financial sector is also undergoing a radical transformation driven by the new computing model resulting from Internet of Things (IoT) applications, The rapid development of technological innovation applied to financial services has led to the emergence of new products and delivery channels. Fintech poses a challenge to the foundations of the strictly regulated financial sector, giving it the potential to bring about radical change in the traditional sector, (Bratasanu, 2017:84) . The integration of technology with financial services also contributes to enhancing long-term operations, which has a significant impact on financial systems. Fintech startups face numerous challenges, most notably the digital divide. The use of fintech services also helps promote financial inclusion and expand banking services to reach the unbanked, enabling these companies to participate in the digital economy (Girish & Bhowmik, 2023:2) . Figure () illustrates these factors.

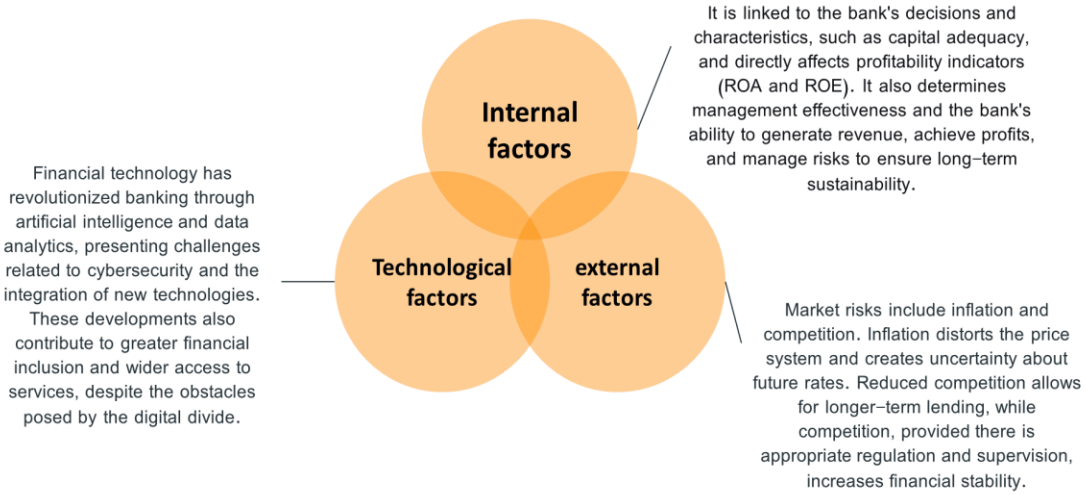

Figure (2) Factors Influencing the Assessment of Banks' Financial Performance
source : was prepared by the researcher

Practical Aspect

Variable Measures

Digital payments	**Real-time gross settlement system**	**RTGS**	
	Retail payment system		
Financial Valuation	Profitability	$ROA = \frac{NI}{TA}$ $ROE = \frac{NI}{E}$	(Alabassi et al., 2022:36)
	Liquidity	$LA/TA = \frac{LA}{TA} \times 100$ $LA/STL = \frac{LA}{S-TL} \times 100$	(Uddin et al., 2016:38) (Heath, 2013:37)

source : was prepared by the researcher using statistical software.

Descriptive analysis

Descriptive analysis is a fundamental stage in economic and financial studies, as it aims to provide an initial overview of the characteristics of the data under study by presenting its temporal evolution and analyzing its general trends. This analysis contributes to forming a preliminary understanding of the nature of the variables before moving on to statistical analysis and testing the relationships between variables. Descriptive analysis can be illustrated in the following Table ().

Table () Indicators of the Independent and Dependent Variables: Quarterly Data for the Period (2024–2018)

Year	Quarter	RTGS		IRPSI		Profitability Analysis		Liquidity Indicators	
		Growth rate of transaction volume %	Growth Rate of Transaction Value %	Growth Rate of Number of Transactions %	Growth rate of transaction value %	ROA	ROE	LA/TA	LA/STL
2018	Q1	-4.81	22.15			0.440	0.261	0.340	0.000
	Q2	-21.19	-40.67	68.55	70.96	0.340	0.203	0.349	0.068
	Q3	10.28	99.66	17.77	18.82	0.188	0.110	0.438	0.137
	Q4	-2.07	-32.17	99.81	96.65	0.044	0.015	0.409	0.075
2019	Q1	-0.67	-27.33	45.28	70.12	0.000	0.000	0.579	0.466
	Q2	4.83	60.74	47.95	83.35	0.164	0.132	0.719	0.727
	Q3	14.42	37.76	55.05	71.70	0.278	0.230	0.617	0.441
	Q4	-5.88	7.74	40.72	69.72	0.267	0.229	0.634	0.516
2020	Q1	3.72	0.03	-10.99	35.73	0.363	0.360	0.638	0.441
	Q2	-35.87	-31.59	76.79	28.19	0.247	0.233	0.579	0.497
	Q3	38.39	-9.00	45.65	46.92	0.212	0.205	0.553	0.298
	Q4	13.63	-9.41	74.97	70.86	0.360	0.332	0.647	0.453
2021	Q1	-9.88	36.31	1.88	-8.67	0.177	0.162	0.630	0.540
	Q2	40.18	9.16	12.34	47.09	0.383	0.317	0.621	0.516
	Q3	6.99	25.01	34.96	21.01	0.199	0.177	0.647	0.540
	Q4	-12.44	0.98	40.60	39.93	0.105	0.106	0.681	0.590
2022	Q1	2.99	30.41	12.69	13.19	0.377	0.357	0.779	0.714
	Q2	-1.30	14.99	56.01	48.37	0.391	0.384	0.804	0.714
	Q3	-0.18	0.96	-6.27	-7.75	0.671	0.627	0.800	0.702
	Q4	3.71	9.46	-18.21	-13.99	0.573	0.561	1.000	1.000
2023	Q1	-12.90	-24.54	96.52	19.96	1.000	1.000	0.868	0.752
	Q2	5.43	30.69	-32.28	2.37	0.578	0.599	0.728	0.509
	Q3	7.67	20.71	48.08	-1.22	0.748	0.730	0.621	0.385
	Q4	-8.80	-12.09	-11.07	12.67	0.540	0.536	0.685	0.478
2024	Q1	25.26	2098.05	40.12	34.52	1.000	0.857	0.464	0.568
	Q2	-11.95	6.51	112.19	37.86	1.000	0.873	0.000	0.578
	Q3	16.80	2.58	30.12	26.37	1.000	0.841	0.624	0.557
	Q4	-10.31	13.44	11.21	6.06	1.000	0.794	1.000	0.505

Source: Compiled by the researcher based on data from the Iraqi Central Bank's statistical bulletins

source : was prepared by the researcher using statistical software.

Analysis of the stationarity of the variables using the ADF test

To begin any analysis of the variables, we must first ensure the stationarity of the study variables in econometric studies. Therefore, the researcher used the ADF test to detect the stationarity of these variables. The following table shows the results of applying the test using EViews 13.

Table ( ) Unit Root Test for Independent Variable Data Using ADF

UNIT ROOT TEST TABLE (ADF)			
At Level			
		IRPSI	**RTGS**
With Constant	t-Statistic	3.312236	1.990405
	1% level	-3.699871	-3.752946
	5% level	-2.976263	-2.998064
	10% level	-2.627420	-2.638752
With Constant & Trend	t-Statistic	-1.018305	-0.687375
	1% level	-4.356068	-4.339330
	5% level	-3.595026	-3.587527
	10% level	-3.233456	-3.229230
Without Constant & Trend	t-Statistic	4.986319	0.871849
	1% level	-2.653401	-2.653401
	5% level	-1.953858	-1.953858
	10% level	-1.609571	-1.609571
At First Difference			
		IRPSI	**RTGS**
With Constant	t-Statistic	-2.668113	-2.356433
	1% level	-3.711457	-3.752946
	5% level	-2.981038	-2.998064
	10% level	-2.629906	-2.638752
With Constant & Trend	t-Statistic	-3.332121	-2.773341
	1% level	-4.356068	-4.416345
	5% level	-3.595026	-3.622033
	10% level	-3.233456	-3.248592
Without Constant & Trend	t-Statistic	-2.137527	-4.619017
	1% level	-2.656915	-2.656915
	5% level	-1.954414	-1.954414
	10% level	-1.609329	-1.609329

Source: Compiled by the researcher based on the results of EViews 13:

Table ( ) Unit Root Test for Dependent Variable Data Using ADF

UNIT ROOT TEST TABLE (ADF)					
At Level					
		ROA	**ROE**	**LATA**	**LASTL**
With Constant	t-Statistic	-0.085335	-0.384595	-1.577456	-2.768075
	1% level	-3.711457	-3.711457	-3.788030	-3.699871
	5% level	-2.981038	-2.981038	-3.012363	-2.976263
	10% level	-2.629906	-2.629906	-2.646119	-2.627420
With Constant & Trend	t-Statistic	-2.761604	-3.826740	-1.285479	-2.561796
	1% level	-4.356068	-4.339330	-4.467895	-4.339330
	5% level	-3.595026	-3.587527	-3.644963	-3.587527
	10% level	-3.233456	-3.229230	-3.261452	-3.229230
Without	t-Statistic	0.802080		0.566255	-0.459750

Constant & Trend	1% level	-2.656915		-2.679735	-2.653401
	5% level	-1.954414		-1.958088	-1.953858
	10% level	-1.609329		-1.607830	-1.609571
At First Difference					
		ROA	**ROE**	**LATA**	**LASTL**
	t-Statistic	-8.588389		-3.969739	-5.274308
With Constant	1% level	-3.711457		-3.788030	-3.711457
	5% level	-2.981038		-3.012363	-2.981038
	10% level	-2.629906		-2.646119	-2.629906

source :was prepared by the researcher using statistical software.

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	1% level	-2.656915	-2.656915
	5% level	-1.954414	-1.954414
	10% level	-1.609329	-1.609329

Source: Compiled by the researcher based on the results of EViews 13:

Testing and Estimation of the Standard Model

An ARDL model was estimated here to examine the impact of the independent variables IRPSI and RTGS on the dependent variable ROA, with the best model selected based on the Akaike Information Criterion (AIC). The comparison results showed that the best model is ARDL(1, 2, 1, 0), which reflects the presence of time-varying

dynamics in both the dependent variable and some of the explanatory variables. The researcher conducted a preliminary estimation of the standard model used to measure the effect of the independent variables on the dependent variable, and the results are shown in the following table:

Table ( ) Estimation of the Autoregressive Decay of the Distributed Lag of Independent Variables on the Dependent Variable

Dependent Variable: ROA				
Method: ARDL				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ROA (-1)	0.173098	0.172080	1.005913	0.3278
IRPSI	0.000133	0.000103	1.286797	0.2145
IRPSI (-1)	-0.000253	0.000144	-1.758975	0.0956
IRPSI (-2)	0.000247	0.000126	1.954955	0.0663
RTGS	1.01E-06	1.92E-06	0.524385	0.6064
C	-0.117590	0.196952	-0.597050	0.5579
R-squared	0.880164	Mean dependent variable		0.456346
Adjusted R-squared	0.833562	Standard deviation of dependent variable		0.325757
Standard error of regression	0.132899	Akaike information criterion		-0.950802
Sum of squared residuals	0.317916	Schwarz criterion		-0.563695
Log likelihood	20.36042	Hannan-Quinn criterion		-0.839329
F-statistic	18.88652	Durbin-Watson statistic		2.327240
Prob(F-statistic)	0.000000			
***Note: p-values and any subsequent tests do not account for the model**				

Source: Author's work based on results from the program EViews 13

Return on Equity (ROE)

First: Testing and Estimating the Standard Model

An ARDL model was estimated here to examine the impact of the independent variables IRPSI, C-ACH, and RTGS on the dependent variable ROE using quarterly data for the period 2018Q3–2024Q4, with the best model selected based on the Akaike Information Criterion (AIC). The results of the model selection indicated that the best model is ARDL(1, 2, 1, 0), which reflects the presence of time-varying dynamics in both the dependent variable and some of the explanatory variables. The researcher conducted a preliminary estimation of the standard model used to measure the effect of the independent variables on the dependent variable, and the results are shown in the following table:

Table ( ) Estimation of the Autoregressive Decay of the Distributed Lag of Independent Variables on the Dependent Variable

Dependent Variable: ROE				
Method: ARDL				
Variable	Coefficient	Standard Error	t-Statistic	Prob.*
ROE (-1)	0.265763	0.166495	1.596217	0.1278
IRPSI	0.000157	9.55E-05	1.645503	0.1172
IRPSI (-1)	-0.000279	0.000133	-2.100952	0.0500

IRPSI (-2)	0.000238	0.000117	2.029506	0.0575
RTGS	-7.09E-07	1.78E-06	-0.398013	0.6953
C	-0.154964	0.179508	-0.863272	0.3993
R-squared	0.876268	Mean dependent variable		0.414115
Adjusted R-squared	0.828150	Standard deviation of dependent variable		0.295147
Standard error of regression	0.122353	Akaike information criterion		-1.116160
Sum of squared residuals	0.269463	Schwarz criterion		-0.729053
Log likelihood	22.51008	Hannan-Quinn criterion		-1.004687
F-statistic	18.21081	Durbin-Watson statistic		2.354756
Prob(F-statistic)	0.000001			

Source: Author's work based on results from the program EViews 13

Estimation of the long-run relationship according to the ARDL model

The researcher obtained the ARDL model estimation results for the long-run relationship and presented the results obtained using EViews 13 in the following table:

Table ( ) Results of the long-run relationship estimation using the ARDL model

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IRPSI	0.000158	5.88E-05	2.691837	0.0149
C_ACH	3.42E-05	2.23E-05	1.534821	0.1422
RTGS	-9.66E-07	2.41E-06	-0.400658	0.6934
C	-0.211055	0.251122	-0.840446	0.4117
Cointeq = ROE - (0.0002*IRPSI + 0.0000*C_ACH - 0.0000*RTGS - 0.2111)				

Source: The researcher's work based on the results of the program EViews 13

Testing and Estimation of the Standard Model

An ARDL model was estimated to examine the impact of the independent variables IRPSI and RTGS on the dependent variable LASTL, with the best model selected based on the Akaike Information Criterion (AIC). The results showed that the best model is ARDL(1, 0, 0, 0), indicating the presence of time-varying dynamics in both the dependent variable and some explanatory variables. The researcher conducted a preliminary estimation of the standard model used to measure the effect of the independent variables on the dependent variable, and the results are shown in the following table:

Table ( ) Estimation of the Autoregressive Decay of the Distributed Lag of Independent Variables on the Dependent Variable

Dependent Variable: LASTL				
Method: ARDL				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LASTL(-1)	0.596116	0.165026	3.612266	0.0015
IRPSI	-6.46E-06	4.73E-05	-0.136663	0.8925
C_ACH	1.24E-05	1.51E-05	0.819087	0.4215
RTGS	-6.14E-08	2.08E-06	-0.029494	0.9767
C	0.064339	0.168475	0.381892	0.7062
R-squared	0.553753	Mean dependent variable		0.509889
Adjusted R-squared	0.472617	Standard deviation of		0.204237

		dependent variable	
Standard error of regression	0.148319	Akaike information criterion	-0.813325
Sum of squared residuals	0.483968	Schwarz criterion	-0.573355
Log likelihood	15.97989	Hannan-Quinn criterion	-0.741970
F-statistic	6.825018	Durbin-Watson statistic	1.948553
Prob(F-statistic)	0.000991		

Source: Researcher's work based on results from the program EViews 13

Ratio of liquid assets to total assets LATA

First: Testing and Estimation of the Standard Model

An ARDL model was estimated here to examine the impact of the independent variables IRPSI, C-ACH, and RTGS on the dependent variable LATA, with the best model selected based on the Akaike Information Criterion (AIC). The results of the comparison indicated that the best model is ARDL (1, 0, 0, 2), which reflects the presence of time-varying dynamics in both the dependent variable and some of the explanatory variables. The researcher performed a preliminary estimation of the standard model used to measure the effect of the independent variables on the dependent variable, and the results are shown in the following table:

Table ( ) Autoregressive Decay Estimation of the Distributed Lagging of Independent Variables on the Dependent Variable

Dependent Variable: LATA				
Method: ARDL				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LATA (-1)	0.562578	0.124376	4.523214	0.0002
IRPSI	1.15E-05	3.27E-05	0.352561	0.7283
RTGS	-3.47E-06	1.20E-06	-2.898554	0.0092
RTGS (-1)	-3.97E-06	1.62E-06	-2.445987	0.0244
RTGS (-2)	1.10E-05	1.34E-06	8.201626	0.0000
C	0.187274	0.125606	1.490957	0.1524
R-squared	0.868672	Mean dependent variable		0.644808
Adjusted R-squared	0.827201	Standard deviation of dependent variable		0.195099
Standard error of regression	0.081101	Akaike information criterion		-1.961442
Sum of squared residuals	0.124970	Schwarz criterion		-1.622724
Log likelihood	32.49874	Hannan-Quinn criterion		-1.863903
F-statistic	20.94607	Durbin-Watson statistic		1.739175
Prob(F-statistic)	0.000000			

Source: Author's work based on results from the program EViews 13

Estimation of the long-run relationship according to the ARDL model

The researcher obtained the ARDL model estimation results for the long-run relationship and presented the results obtained using EViews 13 in the following table:

Table ( ) Results of the long-run relationship estimation using the ARDL model

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IRPSI	2.63E-05	7.18E-05	0.366600	0.7180

RTGS	8.04E-06	6.31E-06	1.272881	0.2184
C	0.428130	0.247145	1.732307	0.0994
Cointeq = LATA - (0.0000*IRPSI + 0.0000*C_ACH + 0.0000*RTGS + 0.4281)				

Liquid Assets to Short-Term Liabilities Ratio (LASTL)

Source: was prepared by the researcher using statistical software.

First: Testing and Estimation of the Standard Model

An ARDL model was estimated to examine the impact of the independent variables IRPSI, C-ACH, and RTGS on the dependent variable LASTL, with the best model selected based on the Akaike Information Criterion (AIC). The results showed that the best model is ARDL(1, 0, 0, 0), indicating the presence of time-varying dynamics in both the dependent variable and some of the explanatory variables. The researcher conducted a preliminary estimation of the standard model used to measure the effect of the independent variables on the dependent variable, and the results are as shown in the following table:

Table ( ) Autoregressive regression estimates of the distributed lags of the independent variables on the dependent variable

Dependent Variable: LASTL				
Method: ARDL				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LASTL(-1)	0.596116	0.165026	3.612266	0.0015
IRPSI	-6.46E-06	4.73E-05	-0.136663	0.8925
C_ACH	1.24E-05	1.51E-05	0.819087	0.4215
RTGS	-6.14E-08	2.08E-06	-0.029494	0.9767
C	0.064339	0.168475	0.381892	0.7062
R-squared	0.553753	Mean dependent variable		0.509889
Adjusted R-squared	0.472617	Standard deviation of dependent variable		0.204237
Standard error of regression	0.148319	Akaike information criterion		-0.813325
Sum of squared residuals	0.483968	Schwarz criterion		-0.573355
Log likelihood	15.97989	Hannan-Quinn criterion		-0.741970
F-statistic	6.825018	Durbin-Watson statistic		1.948553
Prob(F-statistic)	0.000991			

Source: Author's work based on results from the program EViews 13

Estimation of the long-run relationship according to the ARDL model

The researcher obtained the ARDL model estimation results for the long-run relationship and presented the results obtained using EViews 13 in the following table:

Table ( ) Results of the long-run relationship estimation using the ARDL model

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IRPSI	-1.60E-05	0.000120	-0.133615	0.8949
RTGS	-1.52E-07	5.13E-06	-0.029634	0.9766
C	0.159302	0.411845	0.386800	0.7026
Cointeq = LASTL - (-0.0000*IRPSI + 0.0000*C_ACH -0.0000*RTGS + 0.1593)				

Source: Researcher's work based on results from the program EViews 13

Conclusions

1. The results showed a positive and significant effect of the retail payment system (IRPSI) on the profitability indicators (ROA and ROE), reflecting its role in enhancing banks' financial returns.
2. Digital payment systems (RTGS and IRPSI) did not show a significant long-term effect on liquidity indicators, indicating a weak equilibrium relationship for short-term liquidity.
3. The results indicated a rapid short-term response to correcting imbalances (approximately 40%), demonstrating banks' ability to adapt while the role of payment systems remains more operational than strategic.

Recommendations

1. Expand or deepen retail payment services (IRPSI) to enhance profitability and increase revenue.
2. Rely on independent liquidity management models and avoid dependence on digital payment systems in this regard
3. Develop the infrastructure of payment systems, particularly RTGS, while promoting digital banking awareness to increase its usage.

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