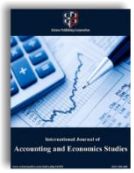
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Research paper



Analyzing The Impact of Electronic Card Adoption on The Profitability of The Iraqi Banking Sector (2017–2023)

Nuha Khalil Halbous *, Dr. Abdulkhleq Dubai Abdulmahdi

University of Babylon / College of Administration and Economics
**Corresponding author E-mail: bus502.noha.khalil@student.uobabylon.edu.iq*

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Abstract

The rapid adoption of electronic cards has reshaped the Iraqi banking sector, influencing customer behavior, operational efficiency, and institutional performance. This study aims to analyze the impact of electronic card adoption on the profitability of Iraqi banks during the period 2017–2023. Using a theoretical framework supported by financial data analysis, the research investigates how digital payment channels contribute to profitability through increased transaction volumes, reduced operational costs, and enhanced fee- and commission-based reve-nues. The findings indicate that electronic card usage has significantly expanded in Iraq, promoting financial inclusion and reducing reliance on cash transactions. However, the growth in electronic cards has not been consistently matched by proportional increases in bank profitability, suggesting the need for more effective integration between digital payment expansion and revenue optimization strategies. This highlights the unstable relationship between card adoption and profitability, underlining the importance of strategic measures to translate digital payment growth into tangible financial returns. The study provides practical insights for policymakers and banking institutions to enhance operational efficiency, support financial inclusion, and ensure sustainable profitability amid Iraq's ongoing digital transformation.

Keywords: *Electronic Cards; Bank Profitability; Financial Inclusion; Operational Efficiency; Digital Transformation; Iraq.*

1. Introduction

In recent years, the Iraqi banking sector has experienced notable advancements in financial technology adoption, particularly through the widespread use of electronic cards. These cards have become a pivotal tool for facilitating financial transactions, enhancing operational efficiency, promoting financial inclusion, and reducing reliance on cash, thereby directly impacting banks' performance and profitability. Between 2017 and 2023, customer behavior in Iraq has shifted significantly toward digital channels for withdrawals, deposits, and electronic payments. Evidence suggests that the proliferation of electronic cards not only increases transaction volumes but also affects profitability by lowering operational costs and boosting fee- and commission-based revenues.

This study adopts a theoretical and analytical approach to examine the impact of electronic card adoption on the profitability of the Iraqi banking sector. It addresses a critical knowledge gap in Iraqi banking literature, thereby providing empirical and strategic insights that support operational efficiency and sustainable profitability during Iraq's digital transformation period. Despite the widespread adoption of electronic cards, few studies in Iraq have empirically analyzed their direct impact on bank profitability across all banking sectors, highlighting the need for this study as a pioneering attempt to provide empirical evidence linking digital payment adoption to financial performance.

This study is innovative in linking digital payment adoption quantitatively to bank profitability in Iraq, providing insights not only into transaction trends but also into the strategic financial impact of electronic card usage.

The paper is structured into five main sections, beginning with a theoretical framework and concluding with conclusions and policy recommendations.

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2. Theoretical Framework of Electronic Cards

2.1. Definition and types of electronic cards

2.1.1. Electronic cards

Electronic cards are secure, electronically encoded payment instruments that enable users to conduct transactions, obtain services, and withdraw cash without relying on physical currency. They function as an efficient alternative to cash and generate additional banking revenues through fees and commissions.
From these definitions, electronic cards can be understood as a dual-purpose financial instrument: they offer convenience and efficiency to users in daily and commercial transactions, while generating additional revenue streams for banks through transaction fees and commissions.
The adoption of electronic cards theoretically contributes to banks' profitability by increasing fee-based income, reducing cash handling costs, and improving operational efficiency

2.1.2. Types of electronic cards

2.1.2.1. Credit cards

Also known as charge cards (although technically distinct in some banking systems), these are issued by banks within predetermined credit limits. They allow holders to make immediate purchases and settle the balance later, with interest applied on outstanding amounts exceeding the monthly limit

2.1.2.2. Debit cards (non-credit cards)

Also known as instant debit cards, these provide immediate access to goods, services, or cash withdrawals, with the amounts deducted directly from the holder's bank account. The monthly statement serves solely as a record of transactions.

2.1.2.3. Prepaid cards

These cards are loaded with a predetermined monetary value. Each transaction deducts from this balance until it is depleted. To continue usage, the card must be recharged.
Each type of electronic card affects bank profitability differently: credit cards generate interest and fee income, debit cards support transaction-based fees, and prepaid cards provide predictable revenue streams from reload and usage fees

2.2. Importance of electronic cards

Electronic cards surpass traditional payment methods due to several key advantages:

2.2.1. Confidentiality

Transactions conducted via electronic cards are highly confidential, supported by encryption and authentication protocols, ensuring the protection of users' financial and personal information.

2.2.2. Security and convenience

Electronic cards streamline financial transactions, whether via mobile devices or computers, minimizing the need for cash handling. Merchants are assured of full payment for electronic transactions, which can positively influence sales volume.

2.2.3. Global acceptance

Electronic cards are internationally recognized and can be utilized for cross-border transactions via secure electronic networks.

2.2.4. Electronic money-based transactions

Payments are processed using electronic money stored digitally on the card or within the managing institution's system. Transactions occur only after deducting the corresponding amounts, allowing secure contract fulfillment between geographically distant parties through online platforms.

2.3. Challenges and risks of electronic cards

Despite their advantages, the use of electronic cards in Iraq faces several regulatory, technological, and behavioral challenges that limit their optimal adoption. Addressing these challenges requires enhancing awareness of electronic cards' benefits and implementing robust measures to safeguard information security and privacy. The main challenges include:

2.3.1. Regulatory constraints

Payment systems often impose limits on daily transactions and maximum withdrawal amounts to ensure financial control and compliance.

2.3.2. Security breaches

Without strong cybersecurity measures, electronic payment systems are vulnerable to breaches. Users may also be at risk if security protocols are not strictly followed.

2.3.3. Dependence on internet connectivity

Accessing or managing accounts online is impossible without a stable internet connection.

2.3.4. Automated payment errors

Payments processed automatically can occasionally result in errors, especially when multiple daily transactions occur across different recipients.

2.3.5. Fraudulent providers and merchants

Some merchants or service providers may misuse consumers' personal or financial data, emphasizing the need for stronger legal frameworks and consumer protection mechanisms

3. Bank Profitability and Its Role in The Iraqi Economy

3.1. Definition of bank profitability and its importance

Bank profitability is considered a primary objective for all banks, essential for their survival and continuity, and a goal sought after by investors. It also serves as a critical tool for measuring management efficiency in utilizing available resources. According to the Iraqi Central Bank, the standard profit rate should not be less than 5%. Consequently, achieving profits represents a central goal for banks, particularly commercial banks, as it constitutes the most important objective they strive for. Without profitability, banks cannot grow or develop. Each bank seeks to provide optimal services to attract the largest possible number of clients, thereby maximizing its profits. Bank profitability is not only a measure of financial performance but also a key variable potentially influenced by the adoption of digital payment technologies, including electronic cards.
Profit is defined as the returns a bank earns in exchange for offering financial goods and services over a specific period. It is also considered one of the main sources of capital generation for a sound banking system that balances profitability with the maintenance of adequate capital.

3.2. Importance of bank profitability

Achieving profits offers numerous advantages for banks, including the following:

3.2.1. Generating returns is essential to compensate for the risks a bank faces and to enable it to continue operating

3.2.2. Profits serve as an indicator of management efficiency, reflecting the ability to utilize available funds effectively, and assist in planning future activities

3.2.3. Profits provide a buffer against short-term problems, offering financial stability

3.2.4. Profitability is a key tool to measure a bank's progress or lag, identify its strengths and weaknesses, and assess its commitment to survival and development amid changing environmental challenges.

3.2.5. High profits enhance customer confidence, attract new clients, retain existing ones, and enable the bank's management to expand and develop new financial services

4. Analysis and Examination of The Reality of Electronic Cards and Their Impact on The Profitability of The Iraqi banking Sector (2017–2023)

4.1. The reality of electronic cards in Iraq

Iraq has witnessed a gradual shift toward digitalization in the financial services sector, particularly since the initial implementation of electronic payment systems in 2017.
This transformation was driven by both internal and external factors, including policy reforms, technological investments, and the Central Bank's initiatives to modernize payment systems.
Electronic cards in their three main forms first appeared in 2017, as shown in Table 1. The total number of cards issued that year reached 291,302, with prepaid cards representing the largest share of approximately 148,550 cards (around 52% of total cards). Debit cards followed with 127,594 cards (about 43%), while credit cards accounted for the smallest portion with 15,158 cards, representing 5% of the total.
In 2018, the total number of electronic cards increased significantly to 2,170,448 and continued to grow sharply to reach 10,506,625 cards in 2019. Prepaid cards dominated this growth, recording 9,006,951 cards, followed by debit cards with 1,460,891, and credit cards with 38,883 for the same year.
Despite several challenges, such as weak financial literacy among certain population segments and limited internet coverage in some regions, which constrained card usage, the number of electronic cards continued to rise steadily. The figures reached 11,749,408, 14,906,894, 16,202,771, and 19,754,229 cards for the years 2020, 2021, 2022, and 2023, respectively.
This consistent growth, from approximately 16 million cards in 2022 to nearly 19 million in 2023, reflects the government and the Central Bank's strategic direction toward financial digitalization. The steady increase in electronic card issuance reflects both policy initiatives by the Central Bank and growing public trust in digital financial services. The increase can be attributed to several factors, including the improvement of financial infrastructure, reduction in cash dependency, enhancement of financial inclusion, and support for anti-tax evasion efforts. Additionally, it was driven by technological progress, greater awareness, and public confidence in financial technology (FinTech) and its practical applications in daily transactions.

Table 1: Development of Electronic Cards in Iraq (2017–2023).

Year	Debit Cards	Change%	Credit Cards	Change%	Prepaid Cards	Change%	Total Electronic Cards
2017	127594	–	15158	–	147850	—	290602
2018	872894	0.853	22067	0.455	1275487	7.626	2170448
2019	1460891	0.402	38883	0.195	9006951	6.062	10506625
2020	2811503	0.4803	46469	0.195	8891436	-0.013*	11749408
2021	5083997	0.446	50927	0.096	9771970	0.099	14906894
2022	5430434	0.064	61320	0.204	10711017	0.096	16202771
2023	6484402	0.194	126491	1.063	13143336	0.227	19754229

Source: Central Bank of Iraq (2017–2023), compiled by the researcher.
* Note: Negative values in parentheses represent a decline in growth rate.

Based on the data presented in the table above, the historical trend in the growth of electronic card issuance in Iraq between 2017 and 2023 reveals a significant advancement in the country's financial infrastructure and a gradual success in adopting digital payment instruments. This upward trajectory reflects the concerted efforts made by relevant authorities (particularly the Central Bank of Iraq) to promote financial inclusion, reduce reliance on cash transactions, and pave the way toward a more efficient and transparent digital economy. Moreover, this continuous growth represents a vital step toward establishing a resilient financial system aligned with global transformations in financial technology (FinTech).

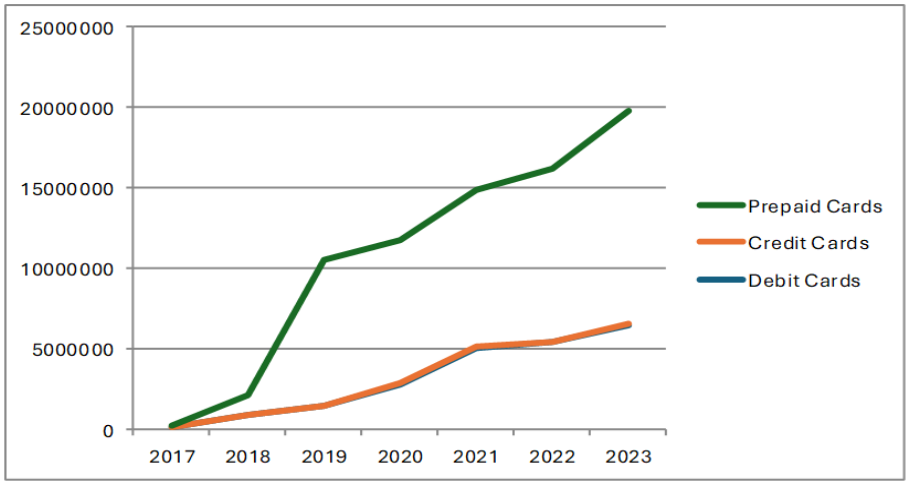


Fig. 1: Illustrates the Development of Electronic Cards Within the Iraqi Banking Sector for the Period (2017–2023).

Note: The vertical axis represents the total number of issued electronic cards, while the horizontal axis represents the years 2017–2023.
Source: Prepared by the researcher based on Table 1.

4.2. The reality of the profitability of the Iraqi banking sector (2017–2023)

The profitability of the banking sector is one of the key indicators used to measure the efficiency of financial performance and the ability of banks to generate sustainable returns within complex economic environments. This indicator holds particular significance in Iraq, where the banking sector represents one of the essential pillars for maintaining financial stability and supporting economic development.
However, Iraqi banks continue to face multiple structural and operational challenges, including weak banking infrastructure, limited public trust, and the dominance of the public sector in financial activities.
The following table presents the profitability of the Iraqi banking sector over the study period (2017–2023).

Table 2: Profitability of the Iraqi Banking Sector for the Period (2017–2023) (In million Iraqi dinar)

Year	Public (Government)	Private (Local)	Private (Foreign)	Private (Islamic/ Participatory) Banks	Total
2017	Banks	Banks	Banks	48811	1322096
2018	1130595	72371	70319	237,299-	656051
2019	863698	14249	15403	35053	1089696
2020	956105	20089	78449	76713	1226183
2021	1020402	73803	55265	76582	914820
2022	784301	4214	49723	121624	2111546
2023	1770720	140130	79072	438522	2291014

Source: Central Bank of Iraq (2017–2023), compiled by the researcher.

Based on the data presented in the table above, the profitability of the Iraqi banking sector during the period (2017–2023) exhibited notable fluctuations, reflecting the interplay of economic, structural, and institutional factors. During the early years (2017–2019), Iraqi banks exhibited relatively weak profitability, primarily due to the continued dominance of state-owned banks, low operational efficiency, and limited diversification of banking income sources, in addition to weak public confidence in the financial system.
By 2020, the combined shocks of the COVID-19 pandemic and the oil price crisis placed significant pressure on the banking system, leading to a marked decline in profitability because of rising credit risk and a slowdown in economic activity.
From 2022 onward, signs of recovery began to emerge, driven by improvements in macroeconomic conditions and an increase in government spending. Moreover, the gradual transition toward banking digitalization and the expansion of electronic payment instruments played a pivotal role in enhancing the operational efficiency and overall performance of Iraqi banks. Although profitability improved from 2022 onwards, this recovery coincided with broader economic factors; the contribution of digital payment adoption, while positive, remains limited in isolation. (Financial Stability Report, 2023, p.42).
The following figure illustrates the sector's gradual adaptation to structural reforms and digital adoption.

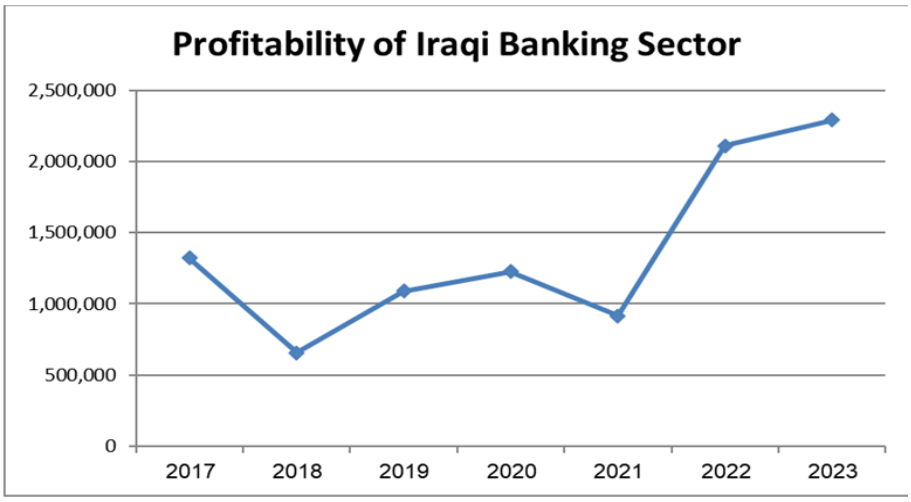


Fig. 2: Illustrates the Profitability of the Iraqi Banking Sector for the Period (2017–2023).

Note: The vertical axis represents total banking sector profits (in million IQD), and the horizontal axis shows the period 2017–2023.
Source: Prepared by the researcher based on data from Table 2.

The analysis indicates that profitability recovery since 2022 coincided with digital payment expansion, suggesting a potential structural shift in the sector's income composition

4.3. The relationship between the electronic card index and the profitability of the Iraqi banking sector (2017–2023)

Analysis of the Impact of the Electronic Card Index on the Profitability of the Iraqi Banking Sector. The electronic card index exerts a measurable influence on the profitability of the Iraqi banking sector, as the increasing use of electronic cards contributes to the diversification of banks' income sources, particularly through fees and commissions associated with withdrawal, payment, and online shopping transactions, thereby enhancing total revenues.
In addition, electronic cards help reduce banks' operational costs by lowering dependence on traditional branches and cash-based transactions, which in turn improves operational efficiency and increases profit margins. This relationship underscores the strategic role of digital payment instruments in supporting financial performance and strengthening the sustainability of the banking sector.
The following table presents the ratio of electronic cards to the profitability of the Iraqi banking sector for the period (2017–2023)

Table 3: Ratio of Electronic Card Index to the Profitability of the Iraqi Banking Sector (2017–2023)

Year	Electronic Card (1)	Change %	Banking Sector Profitability	Change % (4)	Ratio of Electronic Cards to Banking Profitability (1/3)%
2017	290602	(2)	(3)	–	0.2198
2018	2170448	–	1322096	-0.504	3.308
2019	10506625	6.469	656051	0.661	9.642
2020	11749408	3.841	1089696	0.125	9.582
2021	14906894	0.1182	1226183	-0.254	16.295
2022	16202771	0.2687	914820	1.308	7.673
2023	19754229	0.0869	2111546	0.0849	8.622

Source: Prepared by the researcher based on Tables (1, 2).

Econometric Indicator (Correlation Analysis): To complement the descriptive analysis, a simple correlation test was conducted to examine the statistical association between the number of electronic cards and the profitability of the Iraqi banking sector during the period (2017–2023). The results indicate a weak and unstable correlation, suggesting that the rapid increase in electronic card adoption has not been matched by a proportional improvement in profitability. This finding confirms the descriptive conclusion that the expansion of card usage remains largely quantitative and does not yet constitute an effective driver of revenue growth for Iraqi banks. It should be noted that this simple correlation provides only a preliminary understanding; future studies should employ more advanced econometric techniques, such as ARDL or regression models, to capture the causal relationship more accurately.
Although limited in scope, this basic econometric indicator strengthens the analytical argument and highlights the need for a deeper econometric investigation in future research.
Table 3) illustrates the relationship between the number of electronic cards and the profitability of the banking sector in Iraq during the period 2017–2023. The data indicate that the ratio of electronic cards to banking sector profitability was very low in 2017, at 21.98%, but it surged sharply in 2018 to 330.8%, followed by increases to 964.2% in 2019 and 958.2% in 2020. In 2021, the ratio reached its peak at 1629.5%, primarily due to a decline in profits coinciding with the growth in card numbers. In 2022, the ratio declined significantly to 767.3% because of a substantial increase in profitability, before rising again in 2023 to 862.2%.
The results indicate that fluctuations in the ratio of electronic cards to profitability are primarily driven by volatility in profit levels rather than by the inherent impact of card usage itself. Accordingly, the ratio should not be interpreted as a direct indicator of performance improvement. Instead, it reflects a structural imbalance where electronic card expansion continues to grow rapidly, while profitability remains sensitive to macroeconomic conditions and institutional constraints. This refined interpretation ensures a more methodologically accurate understanding of the observed trends. Consequently, the widespread adoption of electronic cards remains primarily a quantitative and functional expansion, rather than a strategic tool for maximizing bank revenues.
Enhancing the linkage between electronic cards and banking sector profitability, therefore, requires the development of banking policies aimed at increasing the utilization of electronic payment services, expanding merchant acceptance networks, implementing additional fees and value-added services, and encouraging customers to use electronic cards in their daily transactions. Such measures would likely

enhance banks' non-interest income, diversify revenue sources, and support sustainable profitability in the medium term. Therefore, strategic policies are needed to translate digital payment growth into tangible bank revenue.

5. Conclusions and Recommendations

This study concludes that electronic cards represent a strategic financial instrument that enhances operational efficiency, supports financial inclusion, and contributes—albeit unevenly—to banking profitability. The study confirms that while electronic card adoption enhances operational efficiency and financial inclusion, its direct impact on profitability is unstable. Their role extends beyond facilitating payments to shaping the broader digital transformation of the Iraqi banking sector.

5.1. Conclusions

5.1.1. Improved profitability and cost reduction

The use of electronic payment methods, including electronic cards, contributes to enhancing the profitability of Iraqi banks by lowering operational costs, improving liquidity management, and mitigating associated risks. However, the study found that the relationship between the number of cards and profitability is unstable, fluctuating between increases and decreases.

5.1.2. Challenges in internal operational efficiency

Some banks have been unable to reduce the effort and time required to complete transactions due to reliance on traditional methods and limited use of record-keeping technology. This has led to increased bureaucracy and negatively impacted the quality of banking services.

5.1.3. Limited macroeconomic impact

The effect of electronic payment methods on certain macroeconomic variables in Iraq has been limited and statistically insignificant, largely due to the economy's heavy dependence on oil and traditional banking practices.

5.1.4. Growth in electronic card usage

According to 2023 data, the number of electronic cards in Iraq reached approximately 19.75 million, indicating a significant increase in the adoption of these payment instruments despite existing challenges.

5.1.5. Efforts by the Central Bank of Iraq

The Central Bank of Iraq continues to expand electronic payment services through the deployment of ATMs and point-of-sale (POS) terminals and by directing banks to extend services to underserved areas, aiming to enhance financial inclusion and improve banking services

5.2. Recommendations

5.2.1. Strengthening digital infrastructure

It is essential to update and develop banks' technological infrastructure to facilitate electronic payment operations and enhance overall performance efficiency.

5.2.2. Bank staff training

Implement training programs for employees to enhance their skills in using modern technologies and to improve the quality of services provided to customers.

5.2.3. Expanding financial inclusion

Continue efforts to deploy ATMs and point-of-sale (POS) terminals in remote and underserved areas to improve access to banking services.

5.2.4. Developing incentive policies

Establish policies that encourage customers to use electronic payment methods, such as offering incentives or fee reductions.

5.2.5. Linking card expansion to actual returns

Ensure that the growth in adoption of electronic cards translates into tangible financial returns through the development of associated banking services.

5.2.6. Raising customer awareness

Promote awareness among clients to enhance the effective use of electronic cards in daily transactions.

5.2.7. Regular monitoring and evaluation

Conduct regular, data-driven assessments of indicators linking electronic card usage and bank profitability to inform strategic decisions and regulatory policies.

5.2.8. Strengthening merchant integration

Expanding the network of merchants and service providers that accept electronic payments is essential. Banks should develop incentive programs targeting retailers, small enterprises, and service outlets to promote POS usage and reduce dependence on cash transactions

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