

The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

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ABSTRACT: The aim of this study is to investigate the impact of MMO, ATMs, POS and POC on the financial performance of banks. This study supports Silber's theory of constraint-induced financial innovation. Using data for the period from 2018 to 2022 due to the availability of data and the recent use of innovation tools in Iraq, this study examines the causal impact of innovation on the performance of commercial banks. 6 sample banks make up the study community. Secondary data was collected during the study period from the annual reports of the Iraq Stock Exchange and statistical bulletins of the Central Bank of Iraq (2021). Based on the analysis of the multiple linear regression model, MMO has the greatest impact on the performance of banks (4.195) due to the large volume and value of transactions that the banking sector goes through. Thus, more mobile and electronic banking services should be provided. The use of ATMs, internet banking and proxy banking has a significant positive impact in the short and long term on the bank's performance in Iraq, with the exception of POC and POS according to experimental results.

KEYWORDS: Financial Innovation, Performance, Bank Profitability, and Iraqi Banking,

1- INTRODUCTION

In economics, the term "financial innovation" is not a new concept. Schumpeter (1934), the first to suggest a link between an economy's innovative performance and the operation of its credit and capital markets, sparked a debate on financial innovation and its impact on growth. Banks have used innovations as powerful strategic variables to outpace any type of competition in the financial services business, making them an excellent technique by which banks can increase their performance while maintaining their market efficacy (Del Gaudio et al., 2021; Kennedy, 2016; Onay & Ozsoz, 2013). Financial innovations, such as mobile banking, are transforming the financial sector's payment system (Del Gaudio et al., 2021; Loaba, 2022).

The payment system is the bridge through which cash payments are transferred from one department to another, playing a crucial role in any economy. As a fundamental pillar of the modern market economy, the Central Bank of Iraq regularly establishes comprehensive rules regarding electronic banking services (e-banking) to enhance the efficiency of the financial system. By addressing the challenges faced by traditional systems in Iraq, the presence of a secure and efficient payment system is of utmost importance for financial stability in any country. For instance, in 2016, the Central Bank of Iraq launched the Payments System Vision Project, which is a strategic vision for the payment system. The vision involves building an electronic payment infrastructure that is used nationwide. The banking industry has been identified as a crucial cornerstone in achieving this goal. The Central Bank of Iraq launched the Localization of Salaries of State Employees' Salaries project in 2016 to reduce payroll costs and keep cash inside the banking system. Employees benefit from a bank account and the right to choose the best financial and banking services and prices. This project is an important step towards expanding financial inclusion in Iraq. It aims to reduce the financial costs of the salary payment process, increase the number of open bank accounts, increase the number of individuals participating in the financial system, and create an atmosphere of competition between banks. 37 banks have contributed to the project, and the Central Bank has established the National Divider system, an electronic money transfer system between banks and electronic payment service providers. The number of employees who have raised their salaries has increased since the launch of the project, and the process of salary localization has contributed significantly to enhancing financial inclusion. Banks introduced a variety of innovative products and services over the years after 2003, all with the aim of improving efficiency and effectiveness and to achieve profitability. Due to the recent dynamic competition and progress in the financial system, all banks are conducting

The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

research to find ways to increase and improve customer accessibility and profitability in order to maintain control over their market share.

The number of ATMs in Iraq has increased from 1.5% in 2017 to 3.6% in 2021, the spread of POS(Point of Sale) devices throughout Iraq from 2.1% in 2017 to 19% in 2021. In addition, the number of POC (Point of Contact) increased from 11.7% in 2017 to 33.5%, 2021, and Mobile payment increased from 46.4% in 2018 to 78.7% in 2021. Despite achieving very high profits compared to the same services in countries, but the quality of services provided is still not at the required level due to the small number of bank branches in regions far from the main branch, as well as the number of ATMs relative to the number of people participating in the financial system is very low. We provide strong and significant evidence of a positive correlation between financial innovation tools and their impact on bank performance in terms of profitability, deposits, and loans for each bank. Online financial innovation tools lead to an increase in profitability, deposits, and lending for each bank. This occurs when the burden of executive activities is lifted from the banks, and employees are utilized more efficiently to collect deposits, generate loans, and facilitate the loan granting process to beneficiaries. This research analyzes the Iraqi banking sector from 2018 to 2022 to determine the impact of online banking services (ATMs, POS, MMO, POC) on bank performance, deposits, and lending activities. The data was collected from 6 banks participating in the Payments System Project. We also contribute to the literature by demonstrating that the impact of financial innovation tools on internet banking on the performance of banks is positive in emerging markets. This can be attributed to a decrease in interest income due to increased competition in the industry as predicted by (Lee et al., 2020). The aim of this research is to assess the impact of financial innovation (represented in ATMs, POS, WEB and MMO) on the financial performance of Iraq using return on assets (ROA) and return on equity (ROE).

2 . LITERATURE REVIEW

Rogers (1995) theorized that relative utility, compatibility, complexity, experiential ability, and adequacy are all factors that influence the spread of innovation. However, these factors are not mutually exclusive and it is impossible to predict the degree or rate of spread of innovation. Innovation is spreading in all Iraqi financial sectors, electronic money transfers and mobile banking are common in the banking industry due to the transformation of customer demands and the speed of service delivery.

Banks acquire specialized developments to gain a competitive advantage related to cost and benefit. ATM, POS, mobile Money payment and electronic money transfers are widespread in the banking industry. Financial innovation will track procedures for acceptance, dissemination and use, regardless of the degree of financial innovation. The importance of electronic based banking products is increasing day by day. It is undoubted that electronic based banking provides relatively low risk, high return and low cost advantages (Al-Waeli et al., 2020b). It can be said that there are many studies addressing the impact of the performance based on the profitability of banks which offer electronic banking products. These studies can be divided into two groups according to the principle of positive and negative influence. These are some of the studies dealing with the electronic and internet banking applications that effect bank's performance (Hanoon et al., 2020b). For example (Del Gaudio et al., 2021; Lee et al., 2020; Aayale, 2017; Del Gaudio et al., 2021; Aduda & Kingoo, 2012; Ashiru et al., 2023; Aduda & Kingoo, 2012; Onay & Ozsoz, 2013). These studies showed that electronic banking applications required advanced technology increasing the overall profitability of the banks' in the study samples. It is essentially obtained that internet banking has a significant positive contribution to development of competition in the banking sector and banks' performance (Al-Waeli et al., 2021). Therefore, internet banking applications make bank to build the orientation of technological innovations up (Arnaboldi & Claeys, 2008; Hanoon et al., 2020a). It has been observed that technology-based and in particular internet banking products reduce the operational risk of the banks (Al-Waeli et al., 2020a). Internet banking applications increase the asset quality of banks and therefore increase the operational profitability and ROE performance directly (Abbas et al., 2022).

According to these studies, financial innovation negatively affects the profitability and operating costs of banks (Sathye, 2005; Pooja & Singh, 2009; Kennedy, 2016). The study found that mobile banking faces various challenges including, system delays by mobile money transfer service providers, slow transaction processing especially during weekends, high transaction costs, limiting the amount of funds that can be withdrawn in one day and fraud. according to (Keskar & Pandey, 2018) Banks should focus on providing privacy and security features to enhance customer trust. (Naeem & Ozuem, 2020) During the covid-19 pandemic that changed customer behavior from traditional banking to online banking. and therefore this makes electronic services important for banks after the global shutdown period (Al-Waeli et al., 2021). Rahi et al., (2021) are developing a theoretical framework to investigate user persistence of online banking. Kiplangat and Tibbs (2018) found that financial innovations have a significant impact on financial performance, with mobile banking being the largest direct contributor. Internet banking is the largest direct contributor. CBI should support electronic application products according to global controls to reduce cost and increase market share, while banks and regulatory bodies should strive to innovate for better and less expensive ways to serve customers (Hanoon et al., 2021). According to Claassens et al. (2002), the most pressing policy issues will be the development of

The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

an enabling environment for e-finance, i.e., the development of regulatory and other frameworks for contract enforcement, information, privacy, telecommunications, security, and public infrastructure for electronic transactions. The positive effects of promotion can also contribute to the growth of the banking system in emerging nations by lowering costs and improving quality while expanding the breadth of financial inclusion (Al-waeli et al., 2020).

Hypothesis H₁: Financial innovation has the highest positive impact on the performance.

The only study evaluating the adoption of financial innovation from the perspective of the Iraqi banking system is by (Abbas et al., 2022), who proved that internet banking reduces operational costs while increasing customer satisfaction and retention in the Iraqi retail banking sector. Accordingly, the main limitation of this study sample was very specific.

2.1- Financial Innovation of Iraq

The Central Bank of Iraq's tools in supporting the diffusion of online electronic services. The project of localization of salaries of state employees' salaries project was launched based on a decision issued by the general secretariat of the Council of ministers in 2016. The aim of the project was to pay salaries to state employees through cards issued by banks operating in Iraq in cooperation with financial payment companies that supply these cards to banks. The project aims to reduce the total cost of the payroll process and keep cash inside the banking system. The benefit to employees is that they have a bank account that enables them to deal with all ATMs and points of sale inside and outside the country, as well as to benefit from other banking services sufficient, which is offered by banks, such as The central bank's strategy is based on creating a safe competitive environment for banks to submit their offers, and the employee has the right to choose the bank according to the best financial and banking services and the most appropriate prices. This project is an important step towards expanding financial inclusion within the country, especially since its stated goal is to reduce the financial costs of the salary payment process, increase the number of open bank accounts with banks, increase the number of individuals participating in the financial system, which will necessarily increase, as well as create an atmosphere of competition between them in order to make the best offers in order to a number of customers (employees) who will settle their salaries, and 37 banks have contributed to this project, in order to receive employees wishing to settle their salaries, and the central bank has established the National divider system, which is an electronic money transfer system between banks and electronic payment service providers through points of sale and ATMs, as a person holding a credit card can make financial withdrawals and purchases from vending machines and points of other banks throughout the country, without the need to rely on the branches of the bank where he deposited his funds, (1) as this system works to reduce the cost of withdrawal for UAE nationals in the event of a withdrawal. In order to reduce the costs of financial services provided by banks to the maximum extent possible and make it convenient for all members of society, the number of employees who have raised their salaries within banks since the launch of the project to the end of (3,985,608) 2021 employees, and the number is constantly increasing until all employees are resettled in the country, the process of salary localization has contributed significantly to enhancing financial inclusion within the country by increasing the number of bank accounts created for employees and increasing the number of electronic cards granted to them, as well as increasing the financial services provided by banks in order to attract their employees, increasing banking awareness. The audience (Central Bank of Iraq, Financial Stability Report, 2021 twelfth issue, Baghdad, 2022). The spread of electronic payment services (ATM, POS, MMO and POC) In order to attract a larger audience and increase transactions within the banking system, it is necessary to enhance electronic payment services and reduce dependence on cash transactions. The Central Bank of Iraq seeks to achieve this by increasing the availability of electronic payment services, which is one of its main goals. The indicator shows the number of POS, POS and ATM machines per 1,000 square kilometers. It shows an increase in the number of ATMs, Points of Sale and POC's across the country, which indicates a rise in their availability. The number of ATMs per square kilometer in Iraq increased from 1.5% in 2017 to 3.6% in 2021. The penetration of POS machines across Iraq also increased from 2.1% in 2017 to 19% in 2021. Moreover, the number of POS devices increased from 11.7% in 2017 to 33.5% in 2021. These percentages are expected to increase in line with the future plans and directions of the Central Bank in this regard (CBI, 2021).

As well, Mobile payment services, The Central Bank of Iraq granted licenses to mobile companies to contribute to the process of mobile electronic payments and provide services such as money transfers, bill payments, electronic card transactions, prepaid recharge, and cash deposit and withdrawal through approved mobile wallets. The financial activity of each company was measured by the amount of money transferred through their services. It was observed that Zain Cash had a dominant control over money transfer operations, as the percentage of money transferred through their platform increased from 46.4% in 2018 to 78.7% in 2021. On the other hand, Asia Hwala's percentage decreased from 53.6% in 2018. to 18% in 2021. As for NASS Wallet, it started its operations in 2020, and initially had a low percentage of money transferred, but it increased from 0.03% in 2020 to 3.2% in 2021. Increased competition among companies has a positive impact on financial development and further helps in the advancement of financial services provided by these companies (CBI, 2021).

The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

2.2 Theory of Constraint-Induced Financial Innovation

According to Silber (1983), the banking sector is highly regulated, which imposes constraints on financial innovation. As a result, innovation becomes limited. The presence of these constraints has two effects: it reduces banks' ability to experiment with new ideas and may also decrease the efficiency of banking institutions. Consequently, commercial banks would tirelessly work to avoid them. This theory suggests that innovations should aim to remove these constraints. There is a diverse set of constraints arising from both internal and external environments concerning commercial banks in Iraq.

After the emergence of the coronavirus pandemic (known as the COVID-19 pandemic) and its spread across countries the world, especially in 2020, led to the imposition of significant restrictions in all countries. The pandemic provides a laboratory for looking at how constraint can force innovation. This was the impetus for a recent study by (Naeem & Ozuem, 2021) and they found that the use of social media during the lockdowns caused by the novel coronavirus promoted the shift to online banking by banks and other financial services companies. Many emerging technology trends of the Fourth Industrial Revolution such as artificial intelligence, big data, blockchain technology, cloud computing, machine learning, quantum computing, etc., are largely driven by the need to overcome operational limitations.(Loaba, 2022) Iraqi banks are subject to significant supervision by the Central Bank of Iraq in the country, so they may not be free to adopt all financial innovations without the explicit consent of the central. The theory of constraint-induced innovation is based on microeconomics and financial innovation analysis, but it overemphasizes innovation. Mobile banking, internet banking, ATMs and other services enabled customers to make transactions 24 hours a day, 7 days a week.

3- METHODOLOGY

This study aims to establish the relationship between financial innovations on financial performance in Iraq. The study focuses on banks listed on the Iraqi Stock Exchange and will cover a period of (5) years. The reason for using a five-year period is the focus of banks on innovations in the last five years from the date of the study. Thus, this study covers Time series data from 2018 to 2022 because the data available for POS, online, mobile money payment (MMO), transaction values from ATMs, POS, mobile money payment (MMO) were obtained from the Statistical Bulletin of the center under the statistics of payment systems . Return on assets and return on equity were obtained from the annual report of a sample of banks. The relationship between the generated independent variable and the dependent variable was studied using the multiple linear regression model. A regression model must meet some basic assumptions in order to be accepted, so diagnostic tests have been performed to determine normality, multilinearity, heterogeneity, and the presence of autocorrelation.

4-RESULTS AND DISCUSSION

The descriptive statistics for the variables are shown in the table 1. The summary gives the arithmetic mean, max, min, standard deviation, and sample size of the variables gathered from the financial statements of 6 banks and the central bank (statistical indicators)

Table 1: Descriptive of Financial Innovation and performance.

	ROA	ROE	ATM	MMO	POS	POC
Mean	3.13	2.34	3.33	3.5	2.58	4.2
Maximum	8.28	12.9	8.500	9.00	5.0	5.50
Minimum	0.1	0.2	0.40	0.400	0.40	1.50
Std. Dev.	2.46	2.87	2.210	2.181	1.197	1.175
Observations	30	30	30	30	30	30

Innovations and performance in Iraq. In terms of financial performance indicators, the return on banks ' assets during the periods witnessed positive returns of 3.13 percent, a growth in returns with a minimum and maximum returns of 8.28 percent and 1 percent, respectively, while the average return on equity was 2.34 percent with maximum and minimum returns of 12.9 percent and 2 percent, respectively. By comparison, the returns that banks make on assets are greater than on equity.

Table 2: Correlation

	ROA	ROE	ATM	MMO	POS	POC
ROA	1					
ROE	0.294	1				

The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

ATM	0.060	0.52	1			
MMO	0.0272	0.60	0.75	1		
POS	-0.207	0.38	0.42	0.43	1	
POC	0.231	-0.61	-0.32	0.51	-0.61	1

Table 2, explain, the correlation coefficient between ATMs and ROE was 0.52, ATMs and MMOs were 0.75 while POS and MMOs were 0.43, respectively. The study conducted the unit root using the enhanced Hadri Z-stat to determine the level of stability of time series data as time series data prone to the stability problem may make the result false.

Table 3: Unit root test.

Method		Statistic	Prob."
Hadri Z-stat	ROA	4.463	0.000
Heteroscedastic Consistent Z-stat		5.011	0.000
	ROE	5.316	0.000
		5.040	0.000
	ATM	5.253	0.000
		5.089	0.000
	MMO	5.048	0.000
		4.030	0.000
	POS	3.873	0.000
		4.303	0.000
	POC	4.933	0.000
		4.989	0.000

Table 4: Granger causality tests between financial innovation and financial performance.

Null Hypothesis:	Obs	F-Statistic
ROE does not Granger Cause ROA	24	3.4
ROA does not Granger Cause ROE		1.32
ATM does not Granger Cause ROA	24	0.01
ROA does not Granger Cause ATM		3.23
MMO does not Granger Cause ROA	24	0.15
ROA does not Granger Cause MMO		0.007
POS does not Granger Cause ROA	24	0.34
ROA does not Granger Cause POS		0.001
POC does not Granger Cause ROA	24	1.54
ROA does not Granger Cause POC		2.56
ATM does not Granger Cause ROE	24	5.23
ROE does not Granger Cause ATM		0.23
MMO does not Granger Cause ROE	24	11.3
ROE does not Granger Cause MMO		0.56
POS does not Granger Cause ROE	24	2.12
ROE does not Granger Cause POS		5.33
POC does not Granger Cause ROE	24	10.22
ROE does not Granger Cause POC		0.36
MMO does not Granger Cause ATM	24	0.06
ATM does not Granger Cause MMO		4.12
POS does not Granger Cause ATM	24	0.25
ATM does not Granger Cause POS		0.61
POC does not Granger Cause ATM	24	4.22
ATM does not Granger Cause POC		0.88
POS does not Granger Cause MMO	24	0.94

The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

MMO does not Granger Cause POS		2.2
POC does not Granger Cause MMO	24	2.5
MMO does not Granger Cause POC		0.22
POC does not Granger Cause POS	24	11.5
POS does not Granger Cause POC		0.26

Table 5: Method- Panel Least Squares

Dependent Variable: ROA

Method- Panel Least Squares

Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error t-Statistic	Prob.
ATM	0.102	0.3347	0.761
MMO	0.173	0.3629	0.637
POS	-0.345	0.5228	0.515
POC	0.496	0.5559	0.379
C	1.	3.1427	0.671
R-squared	0.099	Mean dependent var	3.139
Adjusted R-squared	0.	S.D. dependent var	2.467
S.E. of regression	3.	Akaike info criterion	4.839
Sum squared resid	159.	Schwarz criterion	5.072
Log likelihood	-68.	Hannan-Quinn criter.	4.913
F-statistic	0.688	Durbin-Watson stat	1.889
Prob(F-statistic)	0.606		

Interdependence and the impact of financial innovation on financial performance as shown in tables 3,4 and 5. It has been found that financial innovation services including ATMs, POS, POC, and MMO have a significant positive impact on financial performance (ROA and ROE) in Iraq significant at 5% respectively. For example, a one percent improvement in the deployment, accessibility and availability of ATMs in local communities, as well as the innovation of ATM and mobile money payment (MMO) will have a positive impact on the return on assets (ROA) of exiles in Iraq by 17 percent, 81 percent, 0.6 percent and 0.3 percent respectively as well as return on equity (ROE) by 0.1 percent, 45 percent, 0.01 percent and 0.09 percent respectively. These financial innovations reduce queues at banks; improve the efficiency and effectiveness of banking operations. Contrary to prior expectation, the result proved that the national electronic transfer of funds and instant payments in banks have a negative impact on the financial performance of banks and this may be due to a decrease in the value of transactions, high bank fees and poor awareness of these two financial innovations in the banking sector

The result showed that the majority of financial innovations have a positive impact on the financial performance of the banks. This result indicates that customers prefer electronic application products over traditional application products due to the ease, convenience and accessibility provided by financial innovations, which in turn increase the value of existing electronic application products and increase efficiency as well as effectiveness in financial performance in the banking sector. In fact, the expected results that electronic application products affect financial performance and therefore may lead to poor returns for enterprises when investing are not observed in most developing countries, it has been proven that POC negatively affects bank performance and this result is consistent with (Akhisar et al., 2015) especially in the banking community due to the fact that customers prefer traditional banking services over, weak and irregular power supply and to some extent distrust of the electronic system.

5-CONCLUSION

The study indicates that financial innovations, in general, have a positive impact on the Performance in Iraq measured by return on assets and return on equity, which is similar to the results (Abbas et al., 2022),(Orji et al., 2018),(Mensah et al., 2019)(Ashiru et al., 2023) but was opposed by(Sathye, 2005)that financial innovation, especially internet banking, did not have a significant impact on the bank's performance. This article, as well as more current financial innovation research, has shown that innovation has an impact on the performance of banks over time. In this way, it reflects the importance of banks ' management to implement

The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

electronic application products. Users do not have to go to bank branches to get financial services; therefore, financial innovation allows reducing the cost and speed of completing transactions. Banks should also develop their financial services by fully adapting to mobile banking, according to the annual assessment, to strengthen their market share. It will be useful to increase banks targeting remote areas through the delivery of financial services through the phone, especially 75% of the population of Iraq uses mobile.

The government, through the central bank, should continue to invest in financial sector research while closely regulating these developments to ensure the safety of financial systems, especially payment systems, while banks and regulators should strive to innovate for better and less expensive ways to serve customers. Transaction volumes and, accordingly, commission fees can be significantly increased with shorter time intervals for transactions. Most customers are worried about the lack of trust, security and high cost for such services, which needs to be addressed further. The long-term engine of economic growth in Iraq is financial innovation. It brings us closer to the world. In addition to supporting financial depth, a faster and safer payment system promotes the expansion of enterprises and economic growth in all other areas. This is crucial for achieving the goals of the economic pillar of the central bank's vision.

6-FUTURE DIRECTIONS

Future studies can explore the tools of financial innovation that create excellent savings accounts in the case of good education and promotion, thereby creating a great opportunity for development in general, whether for individuals or financial institutions.

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The Impact of Financial Innovation on the Performance - Evidence from the Iraqi Banking System

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