Impact of Financial Technology on Return and Risk

An applied Study of a Sample of Iraqi Commercial Banks listed on the Iraq Stock Exchange

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Abstract

The research seeks to identify the impact of the use of financial technology (FinTech) in supporting and enhancing the return measured (return on total assets) and achieving financial stability by reducing credit risk measured by the natural logarithm of non-performing loans, and to identify the latest theoretical proposals for financial knowledge on the subject, using a deliberate sample that included ten Iraqi commercial banks listed on the Iraq Stock Exchange for a period of five years, using regression analysis of panel data as a model for research. The results of the research revealed that the use of financial technology has an impact on enhancing and supporting the return and achieving financial stability through risk reduction. The researchers recommended the need to deepen the use of modern financial technology systems such as artificial intelligence, financing and investment platforms, and the provision of financial services over the phone, which represent part of the digitization of business because of its great role in enhancing financial inclusion and banking efficiency, as well as urging the supervisory and supervisory authorities (the Central Bank) to oblige commercial banks to adopt these systems within studied courses of action for their importance in enhancing performance within a sustainable banking environment.

Keywords: FinTech, return, risk, business digitization.

الملخص

يسعى البحث الى التعرف على اثر استخدام التكنولوجيا المالية في دعم وتعزيز العائد مقاساً (بالعائد على اجمالي الموجودات) وتحقيق الاستقرار المالي من خلال تخفيض مخاطر الائتمان مقاساً باللوغاريتم الطبيعي للقروض المتعثرة (غير العاملة)، والتعرف على احدث الطروحات النظرية الخاصة بالمعرفة المالية حول الموضوع مستخدما بذلك عينه عمدية شملت عشرة مصارف تجارية عراقية مدرجه في سوق العراق للأوراق المالية ولمدة خمس سنوات، مستعينا بتحليل الانحدار للبيانات

الطولية كأنموذج للبحث ، وقد افرزت نتائج البحث ان لاستخدام التكنولوجيا المالية اثر في تعزيز ودعم العائد وزيادة المخاطر ،واوصى الباحثون بضرورة التعمق في استخدام انظمة التكنولوجيا المالية الحديثة كالذكاء الاصطناعي ومنصات التمويل والاستثمار وتقديم الخدمات المالية عبر الهاتف والتي تمثل جزءاً من رقمنة الاعمال لما لها من دور كبير في تعزيز الشمول المالي والكفاءة المصرفية فضلا عن حث السلطات الرقابية والإشرافية (البنك المركزي) بالزام المصارف التجارية بتبني تلك الأنظمة ضمن مسارات عمل مدروسة لأهميتها في تعزيز الاداء ضمن بيئة مصرفية مستدامة.

.الكلمات الدالة: التكنولوجيا المالية، العائد، المخاطر، رقمنة الاعمال

1. Introduction

Internet technology has developed rapidly in recent years, enhancing the transition of human society from the information age to the digital age. Cloud computing, big data, etc. have achieved major transformations, changed the method of production and the human lifestyle, and brought about profound changes in the global economic pattern and competition. Relying on new transaction methods, such as mobile payment, social networks, and Internet technology, has enabled traditional finance to break through geographical and time restrictions, and facilitated conducting financial transactions. Under these circumstances, many Fintech companies came into existence, targeting various Internet applications and launching online deposits and loans. These applications enable customers to use small amounts of money at any time, and can also be used as a payment method for online shopping and online payment. Artificial intelligence (AI) here is an important element in effectively improving customer financial experiences, as well as managing investment portfolios using a minimum of human labor by relying on huge amounts of data. AI draws wealth pictures for a large number of clients using advanced computer models, and provides customized asset management plans using AI algorithms.

Traditional commercial banks are the basic component of the financial system in Iraq. These banks face serious challenges and have development opportunities in the macroeconomy. The shift to financial digitization, reform of financial markets, complex and renewable customer requirements, and intensification of international competition all represent restrictions that push these banks to shift towards the use of technology. In the digital age, commercial banks are no longer just providers of simple financial services, but will become value creators through data. Accordingly, it is necessary to work on imagining the extent of the impact of financial technology applications on the development of commercial banks, indicating the correct position of work in managing their assets to achieve the desired return, and taking measures to combat the risks associated with the application of financial technology to reduce credit risks and achieve appropriate financial stability to achieve the sustainable development of commercial banks.

2. Literature Review

2.1. Ban**king and FinTech: Overviw**

The digital economy drives the development of the global economy and is the main force for social change. The digital transformation of commercial banks has become an irreversible trend. The digitalization of commercial banks helps improve the capacity and service level of the real economy and improve the efficiency of serving the real economy. Digital transformation has become the preferred strategy for commercial banks to enhance their competitiveness, so it is very important to study the digital transformation of commercial banks. Nowadays, there is a general consensus in academia in many countries considering the rapid growth of FinTech, commercial banks should implement digital transformation.

However, the path to digital transformation is full of difficulties, so it is necessary to find a starting point for digital transformation in combination with the national macroeconomic situation and the current situation of scientific and technological development, as well as the actual situation of the bank itself. However, commercial banks are afraid of the risks that could It faces both the return and credit risk aspects, and therefore the choice of adopting financial technology in the activities of commercial banks is a very important decision because it will determine the competitive position of the bank in the economy in which adopting financial technology has become a decisive matter. This is what Iraqi commercial banks must face.

2.2. FinTech, Return and Risk

Considering the impact of investments in FinTech on the financial performance of banks, many researchers focused on this and found different results. (Phan et al., 2020) find a negative impact of FinTech on the performance of Indonesian banks, and conclude that the emergence of Indonesian FinTech startups has negatively and significantly affected the return on assets. In addition, they show that more mature, higher-value, state-owned banks are less affected than newer, lower-capitalized private banks. (Untoro and Trinugroho, 2022(in their research on Indonesian banks, also found a weak relationship between the adoption of FinTech and P2P lending on financial performance expressed as net interest margin (NIM), return on assets (ROA), and return on equity (ROE). In 2007, before the start of the Fintech revolution, Lin (2007) studied, through a sample of American banks, how information technology can affect value creation for banks, and found a negative relationship between technology and profitability indicators

represented by return on investment (ROI), (ROE) and (ROA). results of (Chin, 2017) also showed that there is a significant negative relationship between online banking services and social media on the profitability of commercial banks in Malaysia.

On the other hand, according to (Liu et al., 2021), the use of FinTech leads to a positive and significant effect on the return on equity, while a positive but non-significant effect was found on the return on assets. A study on Chinese banks (Chen et al., 2021) supports the existence of a positive and significant impact of FinTech products on the non-financial performance of banks, as the tangible benefit of these products increases customer satisfaction, and the quality of banks' service and employee efficiency are factors that help reduce the shortcomings associated with the difficulty of using them. Financial Products Offered Although it has been empirically proven that investments in FinTech contribute to improving banks' total factor productivity (Wang et al., 2021), they seem unable to guarantee an immediate response in banks' performance. In a study (Ky et al., 2019) of a sample of African banks on the impact of the use of virtual deposits on the profitability of banks, they concluded that the use of virtual loans increases profitability, but this is achieved in the long term, not the short term. (Medyawati et al., 2021) tested six Indonesian banks, finding that the use of ATM transactions, mobile phone transactions, and mobile banking has an impact on the return on assets and profitability of the banking sector. (Dasilas and Karanovic, 2023) tested the UK banking sector for the period (2010_2019), found that FinTech companies positively affect the performance of banks, they found for every new FinTech company entering the UK market, the net interest margin increases (NIM) and return on assets (ROA).

Regarding the relationship between the use of FinTech and the credit risks that banks can face, (Cheng and Qu, 2020) tested the effects of banking FinTech on credit risks, the results showed that banking FinTech significantly reduces credit risks in Chinese commercial banks, additional analyzes show that the negative effects of banking fintech on credit risk are relatively weak among large banks and state-owned banks. (Tan et al., 2024) tested the impact of FinTech development on the credit risk of non-financial companies, using a city-level FinTech development index created based on Ant Finance Service Group data, and found: (1) Non-financial companies in cities with better Fintech services have lower credit risks; (2) The role of FinTech development in reducing corporate credit risk is more obvious for non-state-owned enterprises, small and medium-sized enterprises, enterprises in regions with a low level of commercialization, and enterprises experiencing economic downturn. (Katsiampa et al., 2022) investigated 40 publicly traded banks and 25 listed fintech lenders in China for the period from 2013 to 2019, they found that traditional banks experienced higher operating costs, lower profit margins, and declining loan quality. The performance of traditional banks stabilized in the latter part of the study period (2018-2019) after an initial period of decline, the results also confirmed that the business and regulatory costs of FinTech service providers rose over the course of the

research frame, and there was a noticeable deterioration in the situations of private loans and non-performing loans (SML & NPL) for online lenders during this period. State-owned lenders recorded more resilient performance, especially with regard to asset quality. (Yousef et al., 2024) tested the impact of FinTech on credit risk in the Islamic banking sector in Jordan using data from three major Islamic banks for the period 2016 to 2022. The relationship between FinTech investments (computer equipment, software, and ATMs) and credit risk was tested, the results indicate that investment in computer software and systems significantly reduces credit risk in Islamic banks, while the number of ATMs do not have a significant effect. (Al-Shrari, 2023) analyzed the impact of credit and liquidity risks on the financial performance of Islamic banks in Jordan during the period (2012-2022), through the annual financial reports published by these banks, the results showed that there is a negative and significant relationship between the volume of non-performing loans and the return on assets (ROA). (Shah et al., 2023) tested the impact of FinTech on credit risks before and after financing faced by Islamic banks in Indonesia, Malaysia, United Arab Emirates and Pakistan, by adopting several general and bank-specific economic variables for the period 2009 to 2021, they showed that Malaysia is progressing in terms of reaping the benefits of adopting FinTech in reducing credit risks, and FinTech also helps in improving the level of risks and stability of Islamic banks in the face of systemic risks and financial crises. (Pasha and Abdalla, 2023) examined the impact of the level of financing of FinTech on the profitability and credit risks of 20 Egyptian banks for the period 2017 to 2021. The findings showed a significant impact of FinTech measures on the profitability of banks, and their lack of impact on bank credit risks. (Okoli 2020) tested the relationship between FinTech and bank credit risk expressed as non-performing loans to total loans in the BRICS economies (Brazil, Russia, India, China and South Africa) during the period 1995-2018. The results revealed that macroeconomic and bank-specific factors lead to credit risk. The results also showed a non-linear relationship between FinTech and credit risk. The U-shaped relationship between FinTech and NPLs revealed that BRICS economies face a dilution effect of FinTech on NPLs to a certain extent after which further adoption of FinTech will significantly increase credit risk.

3. Research Problem

By reviewing studies that investigated the relationship between the use of FinTech and financial performance (profitability) through its various indicators, as well as the relationship between the use of FinTech and its impact on the degree of risks that the bank can face. It became clear that there was a wide difference between the results reached by the researchers. Some of them found that there was a positive relationship between the two variables, and some of them found that there was a negative relationship between them. This has highlighted our curiosity to know the nature of these relationships in the Iraqi banking sector, to estimate the extent of the impact of the use of FinTech on the return on assets and the level of risk (non-performing loans) for a group of banks listed on the Iraqi Stock Exchange.

4. Research Objective

The aim of the study is to try to identify the impact of applying FinTech to a sample of Iraqi commercial banks listed on the Iraq Stock Exchange on the return on bank assets (ROA) and on the level of risk that these banks face in collecting their loans (non-performing loans).

5. Research Importance

The importance of the research is highlighted by the controversy and disagreement between researchers about the relationship between the use of financial technology and the ability to face credit risks in Arab commercial banks in general and Iraqi commercial banks in particular. Anyone familiar with the results presented by previous studies, whether presented in the current research paper or elsewhere, would leave decision-makers in Iraqi commercial banks confused about increasing the volume of investment in financial technology. Given the scarcity of scientific research on the Iraqi banking sector, the results of the current research can enhance the ability of decision makers in this sector.

6. Methodology

The quantitative analytical approach was used to identify the extent of the impact of financial technology on return (ROA) and risk by relying on the cross-sectional time series model (Panel Data), and given the presence of some anomalous (extreme) observations in the research data which indicate the presence of some observations that do not follow the majority the data in the models may be due to the intrinsic variance of the data. To perform a regression analysis of data that contains outliers, the weighted least squares method can be used, the use of the ordinary least squares method in the presence of outliers leads to a weak explanatory power of the model. The weighted least squares method is often used as a basis for finding a strong regression model, where outliers are treated by giving them less weight compared to other values. This method is also distinguished by its ability to address the problems of multicollinearity and heterogeneity of error varianc., The following formula explains the regression model

$$Y_{i,t}=\beta_0+\beta_1 FinTech_{i,t}+\beta_2 Size_{i\,t,}+\beta_3 Age_{i,t}+e_{i,t}$$

Where:

$Y_{i,t}$: Indicate the return on assets firstly and the natural logarithm of non-performing loans

secondly as measure of credit risk variable.

Fintech $_{i,t}$: Financial technology, which indicate the content analysis methodology, expressed

by the number of disclosures about financial technology in the annual management report,

which called textual data mining (Chhaidar et al., 2023) (Alabdullah and Ahmed, 2023)

Size $_{i,t}$: denote a control variable that indicates the size of the bank, expressed as the natural logarithm of total assets.

Age $_{i,t}$: a control variable that indicates the age of the bank and is expressed as the number of years from the date of the bank's founding to the year of the data adopted in the research.

e $_{i,t}$: the random error term or the model residual.

The research sample included 10 Iraqi commercial banks. The duration of the research extended over the period (2019-2023), and this data was obtained from the official website of the Iraqi Market Authority for Securities.

7. Results and Discussion

In order to obtain the best regression model through which the effect of the independent variables on the dependent variable is identified, the condition of stability must be met for the variables included in the model to avoid falling into the trap of false regression. This is done through the Augmented Dickey-Fuller test, as it is one of the most common tests. Table (1) Shows the results of that test.

Table (1)
Augmented Dickey-Fuller

Variables	Augmented Dickey-Fuller test statistic	p-value	Level of Stability
ROA $_{i,t}$	36.72	0.1633	Stable at the first difference
Ris $_{i,t}$	34.8635	0.2306	Stable at the level
Fintech $_{i,t}$	34.2415	0.1826	Stable at the first difference
Siz $_{i,t}$	37.34	0.1541	Stable at the level
Age $_{i,t}$	33.826	0.26231	Stable at the level

Results were found using the eviews 10.

It is clear from Table (1) that the dependent variable (credit risk) and the independent variables (bank size, bank age) are stable at the same level, which means that they are integrated at the same degree. The first difference indicates that the other variables (return on total assets and financial technology) have stabilized.

After identifying the stability of the research variables, the extent of the impact of financial technology on the return on assets was tested, and Table (2) shows the results of the test.

Table (2)

Effect of bank FinTech on ROA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-14.23264	4.718787	-3.016165	0.0051
Fintech	0.618905	0.209535	2.953708	0.0059
Size	3.49442	0.801239	4.361273	0.0001
Age	0.212768	0.072128	2.949859	0.006
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.672872	Mean dependent var		0.61212
Adjusted R-squared	0.612464	S.D. dependent var		0.542616
S.E. of regression	0.36734	Sum squared resid		2.183097
F-statistic	5.920446	Durbin-Watson stat		2.09171
Prob (F-statistic)	0.000024			
Unweighted Statistics				
R-squared	0.491339	Mean dependent var		0.525028
Sum squared resid	4.468235	Durbin-Watson stat		2.364163

Results were found using the eviews 10.

Table (2) shows that financial technology has a positive, statistically significant effect on the return on assets at a significance level (0.05), as the regression coefficient for the aforementioned variable reached about (0.62), which means that increasing financial technology by one unit leads to an increase in the return by an amount about (0.62) in terms of the probability value t of (0.0059), and the value of (R-squared) was (0.67), which means that the independent variables in the model explain (67%) of the changes that occur in the dependent variable, return on assets, and the complementary percentage is due to factors Others were not included in the model, and the value of Prob (F-statistic) was (0.000024), which is less than the level of significance, which indicates the significance of the model as a whole.

(3)Table

Effect of bank FinTech on Credit Risk

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C	-7.67595	3.049367	-5.140723	0.0000
Fintech	0.560884	0.138896	4.97411	0.0000
Size	-3.45842	0.607917	-5.688976	0.0000
Age	0.198831	0.060886	3.265611	0.003
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.714793	Mean dependent var	0.781345	
Adjusted R-squared	0.619725	S.D. dependent var	0.778909	
S.E. of regression	0.365867	Sum squared resid	4.417342	
F-statistic	7.518691	Durbin-Watson stat	2.186694	
Prob (F-statistic)	0.000003			
Unweighted Statistics				
R-squared	0.472222	Mean dependent var	0.525028	
Sum squared resid	4.636164	Durbin-Watson stat	2.269501	

Results were found using the eviews 10.

Table (3) shows that financial technology has a positive, statistically significant effect on credit risk at a level of significance (0.05), as the regression coefficient for the aforementioned variable reached (0.56), which means that increasing financial technology by one unit leads to an increase in credit risk by (0.560) in terms of the probability value t of (0.0000), and the value of (R-squared) was (0.71), which means that the independent variables in the model explain (71%) of the changes that occur in the dependent variable credit risk, and the complementary percentage is due to other factors that were not included in the model. The value of Prob (F-statistic) was (0.000003), which is less than the level of significance, which indicates the significance of the model as a whole.

Conclusions:

1. Relying on financial technology as a banking business strategy is capable of enhancing financial inclusion due to the ability of its technologies to deliver banking services to consumers wherever they are without the need for them to expend time and effort to reach the geographical locations of traditional banks.
2. The application of financial technology may lead to an increase in risks, especially credit risks. This results from the fact that Iraqi banks are new to this technology, in addition to their weak financial and human capabilities, which may reflect negatively on their banking risks.

3. Adopting financial technology may support and enhance returns because it has helped banks reduce their costs by closing many of their banking branches because the digitization of banking may not require meeting the customer at the bank's location.
4. The weak appetite of Iraqi banks to adopt financial technology due to their weak financial and human capabilities, as well as the limited knowledge of those responsible for these banks in their role in enhancing and supporting performance.
5. The adoption of financial technology has led to the emergence of a reciprocal relationship between return and risk, because adopting these systems may lead to enhancing returns and increasing risks, especially the risks of financial technology.

Recommendations

1. Urging Iraqi commercial banks to adopt financial technology as a banking business strategy capable of increasing their returns by increasing their market share by reaching a larger number of customers.
2. Urging Iraqi commercial banks, in light of the digitization of banking, to diversify their banking business, other than diversifying their activities or geographical diversification, because this has a major role in reducing their risks.
3. Work to increase awareness among the public and encourage them to embrace technology banking services by introducing them to its importance and highlighting its benefits.
4. Deepening the use of modern financial technology systems, such as artificial intelligence, financing and investment platforms, and providing financial services via phone, which represent part of the digitization of business because of their major role in enhancing financial inclusion and banking efficiency.
5. Urging the regulatory and supervisory authorities (Central Bank of Iraq) to oblige commercial banks to adopt these systems. Within well-studied courses of action due to their importance in enhancing performance within a sustainable banking environment.
6. Urging researchers to conduct other future studies linking financial technology and its role in enhancing the value of banks, or financial technology and its impact on some macroeconomic variables such as the exchange rate, inflation, and gross domestic product.

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