

Impact of digital transaction on the performance of Tunisian banks

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Abstract:

This study proposes to study **the effect of digital technology on the financial performance of Tunisian banks**. Referring to the literature and observation of the adoption of digital, Technologies existing on the Tunisian market mainly ATMs, Internet banking, mobile banking, TEF. Then, a 21-question questionnaire was conducted on Google Forms, and was put on LinkedIn so that answers can be automatically received in real time. Thus, the analyses applied to a sample composed of 73 executives of Tunisian banks. The results show that innovation in the areas of ATMs, Internet banking and mobile banking have a positive impact on the performance of banks.

Keywords: Fintech; digital innovation; financial performance; Tunisian banks

JEL Classification Codes : C12, C3, G21, D21.

Résumé :

Cette étude se propose d'étudier **l'effet du numérique sur la performance financière des banques tunisiennes**. Se référant à la littérature et à l'observation de l'adoption des technologies numériques existant sur le marché tunisien principalement les distributeurs automatiques de billets, les services bancaires par Internet, les services bancaires mobiles, les TEF. Ensuite, un questionnaire de 21 questions a été réalisé sur Google Forms, et mis sur LinkedIn afin que les réponses puissent être reçues automatiquement en temps réel. Ainsi les analyses ont été appliquées à un échantillon composé de 73 cadres de banques tunisiennes. Les résultats montrent que l'innovation dans les domaines des guichets automatiques, des services bancaires par Internet et des services bancaires mobiles, a un impact positif sur la performance des banques.

Mots-clés : Technologie financière ; innovation numérique ; performance financière ; banques tunisiennes

JEL : C12, C3, G21, D21

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1. Introduction

Since the latter half of the 20th century, the world has become interconnected through the Internet, a development that has driven technological advancements and enabled the growth of innovative companies (Block et al., 2017). One such sector is financial technology, or fintech, which merges finance and technology to offer new financial instruments (Bjørnskov & Foss, 2013). For instance, most major banks now provide online banking services, a field highly dependent on information and communication technologies to collect, analyze, and distribute data to all relevant users. This technological foundation enables banks to differentiate their products and services from those of their competitors. Furthermore, the COVID-19 pandemic has accelerated companies' adoption of these technologies as a means of ensuring their long-term sustainability.

However, there remains some confusion about the distinctions between “FinTech,” “financial innovation,” “digitization,” and “digitalization.” Broadly, “FinTech” refers to financial innovations based on information and communication technologies, particularly those associated with the Internet and data processing, which give rise to new business models, applications, processes, products, or services (Schindler, 2017). In contrast, Benmahmoud (2015) defines financial innovation as “the act of creating and popularizing new financial instruments, as well as new technologies, institutions, and financial markets.” Meanwhile, Li (2016) and Sebastian (2017) describe digitization as a progression mechanism for organizations through the use of information, computer, and communication technologies. In the banking sector, digitalization involves substituting traditional branch channels with more economical web channels, which reduces costs and enhances profitability (Habets, 2014).

In this study, these terms are used interchangeably, although the focus is primarily on banking digitalization. We aim to examine the impact of financial innovations on the performance of Tunisian banks during the COVID-19 pandemic. Our focus on the Tunisian market is motivated by the scarcity of empirical evidence on the effects of new technologies on banking performance. Specifically, this study looks at digital services offered by banks, including ATM innovations, internet banking (IB), electronic funds transfers (EFT), and mobile banking (MB) services.

The aim of this research is to determine whether Tunisian banks have maintained their performance after the entry of FinTech startups offering similar banking services.

2. Literature review

2.1 Financial Performance and Investment in digital Technology

The relationship between Digital technology investments and firms' financial performance is particularly relevant in the banking and financial services sector, where digital transformation is essential for maintaining competitiveness. Research shows that digital technology spending can positively impact productivity, operational efficiency, and competitiveness in financial institutions (Arslanian & Fischer, 2019; Nwankpa & Datta, 2020).

For instance, in the banking sector, modern information systems support effective financial risk management and regulatory compliance, contributing to revenue stability and growth (Tallon et al., 2019). Today, investment in digital technology is essential for the continued growth and future development of the financial services industry, especially in banking (Sadeghimanesh, 2013). Amid rising digitalization, financial institutions increasingly adopt digital technology to enhance efficiency, automate processes, optimize data management, and offer personalized services tailored to customer needs (Arslanian & Fischer, 2019; Martins, Oliveira, & Popovič, 2020). This strategic

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digital technology use enables banks to meet evolving customer expectations and stay competitive in a rapidly changing market.

Martins and al. (2020), for example, illustrate how digital technology investments, particularly in online banking technologies, foster customer adoption and strengthen customer relationships, ultimately boosting organizational performance. According to Tallon and al.(2019), IT capabilities act as enablers, allowing institutions to leverage technological infrastructures more effectively when paired with targeted investments. Additionally, Setia, Venkatesh, and Joglekar (2019) stress that while IT skills are essential; they are effective only when integrated into a cohesive organizational strategy supported by sufficient resources. Nwankpa and Datta (2020) further underscore the importance of balancing IT investment and skills, which is crucial for maximizing performance and adapting to industry changes.

A study by Sadeghimanesh and al.(2013), based on a survey of listed banks in Tehran, reveals that various IT dimensions—such as IT knowledge, operational information, and infrastructure—significantly impact the financial performance of these institutions. Today, IT tools, including advanced information systems, artificial intelligence, Big Data, and cloud computing, are critical for enhancing operational efficiency, optimizing processes, and, ultimately, improving organizational financial performance (Nwankpa & Datta, 2020).

2.2 Innovation theory

Innovation is a new productive combination, i.e. the creation of a new product or the introduction of a new method of producing the already existing product (Schumpeter, 1911). Exploring the impact of technological advances on innovation, Pisano (2019) argues that innovation must be integrated into the overall strategy of companies to generate sustainable value, an approach that goes beyond the simple introduction of new products or processes. According to William f Boyce, (1991), innovation can be defined as the access of a new product to the market or the production of an already existing product in a new way. Thus Denning et al, (2010) emphasize that the key to the success of innovation lies in the skills of the innovator, his knowledge and his capacity for social interactions. The theory of financial innovation put forward by Sliber (2015) emphasizes that the main objective of financial innovation is the maximization of the profit of financial institutions. This theory examined financial innovation from macroeconomics, so that it is primitive and specific. IT also influences the innovation capacity of companies, enabling the exploration of new business models and promoting increased agility, essential in a dynamic competitive environment (Martins, Oliveira & Popović, 2020). Thus, companies that adopt digital technology strategically and in alignment with their organizational objectives benefit from significant competitive advantages and a sustainable improvement in their financial performance.

3. Conceptual Framework

Financial innovation includes product innovation, system innovation and process innovation. It means the involvement of new financial instruments with the help of new technologies. Therefore, the impact of financial innovation on the performance of banks in developed and developing countries has become the focus of the literature. In this regard, Fadoju et al, (2018) analyzed a dataset of adopted electronic banking channels such as ATM, Internet (Web) transactions, mobile payments, instant payments and electronic fund transfers on the Nigeria Inter-Bank Settlement System (NIBSS) platform for the six years 2012-2017. This dataset provides an analysis of trends in the value and volume of transactional electronic payments by channel consumed on the Nigerian

platforms. The explanatory variables were Automated Teller Machine (ATM) banking innovation, online banking innovation; electronic funds transfer (EFT) and mobile phone service and performance. The results show that banking innovation affects revenues, return on assets, and profitability and customer deposits of Somali commercial banks and therefore banking innovation has a positive impact on the financial situation of commercial banks. Therefore, we make the following general hypothesis.

H1: Financial innovation has a positive impact on the performance of Tunisian banks.

3.1 Banking Innovation in Automated Teller Machines (ATMs)

An Automated Teller Machine (ATM), also known as a cash machine, allows users to perform routine banking tasks by simply inserting a card, entering a PIN, and accessing funds directly from their account. Beyond withdrawals, ATMs typically offer additional features, enabling customers to conduct various transactions, including depositing cash and checks. Prabu and al. (2021) highlight that ATM technology has become essential to the banking sector, transforming how financial transactions are conducted.

This innovation provides significant benefits, enabling both customers and banks to efficiently manage financial exchanges. As a result, ATMs have spurred substantial research interest regarding their impact on bank performance. For instance, Akhisar and al.(2015) investigated the effects of electronic banking services on bank performance, illustrating the role of ATMs within the broader scope of digital banking.

Based on this context, we propose the following sub-hypothesis:

H1-1: Banking innovation in the form of automated teller machines (ATMs) has a positive impact on the performance of Tunisian banks.

3.2. Mobile Banking

M Banking is a mobile device between banks and consumers that facilitates payments or the use of other mobile financial services regardless of time or space (Mobey Forum, 2008). Thus Suchi and Klein, (2020) report that mobile banking via applications is the latest technological innovation with great potential to improve the banking experience of individuals. Based on the Technology Acceptance Theory (TAM), mobile banking has become a new channel for banks to strategically respond to changing competitive forces and improve customer convenience (Jontathan and Chrong-Guang, 2020). Nevertheless, Grimes, (2010) demonstrated that mobile phone services in the form of three platforms, SMS, Internet and applications and mobile banking are digital channels, cheaper than traditional channels. Their main objective is to improve the profitability of the bank. Hence our sub-hypothesis:

H1-2 The service and performance of mobile phones has a positive impact on the performance of Tunisian banks during covid-19.

3.3. Internet Innovation

Websites have become an important alternative distribution channel for most banking institutions. However, Onay, (2013) points out that online banking as a distribution channel allows banks to adopt a "click and mortar" approach, allowing customers to easily open accounts, create deposits,

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transfer between accounts and pay entirely online, compared to traditional banking services. They are cheaper, anytime, anywhere. This increases the efficiency of banking services. Hence our sub-hypothesis H1-3 following

H1-3 Innovation in Internet Banking Has a Positive Impact on the Performance of Tunisian Banks During Covid-19.

3.4. Electronic Funds Transfer (EFT)

Barnes, (2015) states that electronic funds transfer is a system that transfers funds directly from one bank account to another without any paperwork changing hands. It also specifies any transfer of funds via electronic terminals, including credit card transactions, ATMs, and federal wire transfers. It is used for wire transfers (such as salary payments) and debit transfers. Abukar et al, (2019) point out that the popularity of electronic transfers in online bill payment has opened the door to a paperless world where checks, stamps, envelopes, and paper invoices have become obsolete with electronic transfers, including reducing administrative costs, improving efficiency, simplifying accounting, and increasing productivity. We therefore pose sub-hypothesis:

H1-4 Electronic fund transfer has a positive impact on the performance of Tunisian banks during covid-19.

4. Research Design

Through this section, we will try to present the methodology followed in data collection, the choice of the model, as well as the analysis of the main results found using statistical software.

4.1. Participants and procedure

To study the impact of digital technology on the performance of Tunisian banks, we developed a final questionnaire with 21 questions conducted on Google Forms and which was put on LinkedIn so that we could automatically receive answers in real time. The internet link was sent to the directors of bank branches with a letter explaining the objective of this study and clarified that all the information done is confidential and for research purposes only. In sum, , the statistical analysis ultimately focused on 73 respondents.

4.2. Construct measurement

The measurement items were adopted from prior studies and adapted to suit the context of this study. We tried to explain Financial Performance (FP) by Automated Teller Machines (ATMs), Mobile Banking (MB), Internet Banking (IB), Electronic Funds Transfer (EFT). Thus, the detailed constructs and measurements are listed in Appendix 1.

4.3. Research model

We opt in our work for a multiple linear regression. Our model is as follows:

$$PF = \alpha + \beta_1 SGAB + \beta_2 SBM + \beta_3 SBI + \beta_4 STEF + \epsilon$$

PF: banking performance

SBI: Internet Banking

SGAB: Automatic Teller Machines

SBM: Mobile Banking

STEF: Electronic Funds Transfer
 α : The model constant

4.4 Data analysis

This section consists of econometrically testing the impact of digital technology on the performance of Tunisian banks. The variables selected for this exercise are Automated Teller Machines (ATMs), Mobile Banking (MB), Internet Banking (IB), Electronic Funds Transfer (EFT). The objective is to seek a relationship that would exist between these different variables and banking performance.

5. Results and discussions

5.1 Descriptive statistics

Before proceeding with the estimations, we propose in this part to present the descriptive statistics relating to the variables used as well as the correlations between these variables. The descriptive statistics relating to our study based on the determinants that impact the performance of Tunisian banks, including Automated Teller Machines (ATMs), Mobile Banking (MB), Internet Banking (IB) and Electronic Funds Transfer (EFT). More precisely, it is the mean, the standard deviation "Std. Dev", the maximum and the minimum, which will be studied. These data can be found in the following table:

Table 1: Descriptive statistics

	Obs	Mean	Std.Dev.	Min	Max
SPF	73	50.53247	5.604473	29	57
SGAB	73	9.519481	1.544177	4	12
SBM	73	16.51948	2.093916	11	18
SBI	73	13.20779	1.786924	6	14
STEF	73	11.28571	3.140806	0	13

According to the results presented in Table 1, respondents showed that ATM scores had a positive impact on bank performance, with an average of 9.519481. Similarly, for mobile banking scores, they obtained an average of 16.51948, which indicates that mobile banking scores have a positive impact on bank performance. During the Covid-19 pandemic, we asked some questions to determine the impact of digitalization on the financial performance of Tunisian banks and respondents confirmed that online banking scores had a positive impact on performance growth, with an average of 13.20779. According to the results presented in Table1, respondents believe that electronic fund transfers have a positive impact on bank performance, with an average of 11.28571.

5.2 Pearson Correlation Matrix

Correlation is a statistic that indicates whether there is a relationship between two sample values of the same group of subjects. The correlation coefficient quantifies this relationship by the sign (positive and negative) of the correlation and the strength of this correlation. The relevance is measured on a scale of 0 to 1. 0 means that there is no correlation between the two measures, while 1 means perfect correlation, that is, finding the value of one measure can accurately know the value of the other. In this study, Pearson correlation was used to calculate the correlation between the

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dependent variable, i.e. financial performance and the independent variables namely Automated Teller Machines (ATMs), Mobile Banking (MB), Internet Banking (IB), Electronic Funds Transfer (EFT).

Table 2 : Pearson correlation matrix

	SPF	SGAB	SBM	SBI	STEF
SPF	1.0000				
SGAB	0.5063	1.0000			
SBM	0.5322	0.1041	1.0000		
SBI	0.6603	0.2721	0.1548	1.0000	
STEF	0.7900	0.1918	0.1335	0.3661	1.0000

(***p < 0.001, **p < 0.05, *p < 0.01)

According to this table, the relationship between the independent variable ATM innovation (SIGAB) and the dependent variable financial performance (PF) is positive and significant at the rate of 10%. The independent variable mobile banking innovation (SIBM) and financial performance (PF) has a weak positive correlation with a significance level of 1%. The correlation between the independent variable Internet banking innovation (SIBI) and financial performance (PF) is positive with a significance level of 1%. The correlation between the independent variable electronic funds transfer (SITEF) and financial performance (PF) is weak and positive at the rate of 10%. This result is expected since the independent variables chosen in this study directly influence the bank's profit and subsequently their performance.

5.3. Shapiro-Wilk test, normal data test

The Shapiro-Wilk normality test is used to verify the normality condition, a condition for the validity of a parametric test. It involves the null hypothesis that the variable generating the sample follows a normal distribution. Thus, a low p-value indicates a low risk of being wrong in concluding that the data are non-normal. In other words, if p-value < alpha risk, the data deviate significantly from normality:

Tableau 3: Shapiro-Wilk test, normal data test

Variable	Obs	W	V	Z	Prob>z
SPF	73	0.87274	8.105	4.561	0.0000
SGAP	73	0.96033	2.526	2.020	0.02169
SBM	73	0.88659	7.233	4.310	0.0000
SBI	73	0.66049	21.623	6.700	0.0000
STEF	73	0.74813	16.041	6.049	0.0000

(***p < 0.001, **p < 0.05, *p < 0.01)

Based on the results of the table, the probabilities of the variables; Mobile Banking (MB), Internet Banking (IB), Electronic Funds Transfer (EFT), are less than the alpha value significance threshold of 0.05, therefore the null hypothesis of normality of the residuals is accepted. While the probability

of the variable Automated Teller Machines (ATMs) is greater than the alpha value significance threshold of 0.05, therefore the null hypothesis of normality of the residuals is rejected.

5.4. Multi-collinearity test

In a regression, multi-collinearity is a problem that occurs when some of the model's predictor variables measure an identical phenomenon. A pronounced multi-collinearity is a problem, since when the variance of the regression coefficients increases, they will be unstable and difficult to interpret. We can identify scientifically through the variance inflation factor VIF. The latter indicates to what extent the standard errors are inflated due to the presence of multi-collinearity.

Tableau 4 : Multi-collinearity test

Variable	VIF	1/VIF
SBI	1.23	0.815415
SGAP	1.10	0.913156
STEF	1.17	0.851650
SBM	1.04	0.966048
Mean Vif	1.13	

Based on the results in Table 4, there is no multicollinearity problem.

5.5 Heteroskedasticity Test

Heteroskedasticity is present when the variance of the model's residuals is not constant. Although heteroskedasticity does not bias the OLS estimation of the coefficients, it does indicate coefficient inefficiency. To detect heteroskedasticity, several tests can be applied, including the Glejser test, the modified Wald test, and the White test. Here, we will focus on the commonly used Breusch-Pagan test.

Tableau 5 : Heteroskedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity		
Ho : Constant variance		
Variables : fitted values of SPF		
Chi2(1)	=	0.75
Prob > chi2	=	0.3876

According to Table 5, the Breush-Pagan test applied on the model detected the presence of a heteroskedasticity problem, since the probability p-value <5%. This shows the presence of a heteroskedasticity problem.

6. Model estimation and discussion of results

To begin with, OLS regression is a method that allows estimating the coefficients of a multivariate linear regression by minimizing the sum of squares of the residuals.

Tableau 6 : Model estimation

Linear régression					
Number of obs=73					
F (6,66) =73.68					
Prob>F=0.0000					
R_squared=0.8238					
RoostMSE=0.46272					
Robust					
Spf	Coef.	Std.Err.	t	P> t	[95% Conf. Interval]
Sgab	0.0732282	0.038087	1.92	0.059	0.002815 0.1492714
Sbm	0.002815	0.048032	1.90	0.060	0.006345 0.1893420
Sbi	0.092012	0.0496039	1.85	0.068	0.0070254 0.1910494
Stef	0.0256605	0.0139429	1.84	0.070	0.0021773 0.0534983
_cons	2.142302	2.119935	1.01	0.316	6.374888 2.090284

(***p < 0.001, **p < 0.05, *p < 0.01)

According to this table, the coefficient of determination R² is significant; it is 82.38% so the linear adjustment is of good quality.

6.1 Banking innovation (GAP) and bank's performance

The regression coefficient of the gap variable is positive for the study model, i.e. a value of (Coef = 0.0732282 t-student = 1.92; P = 0.059) significant at p < 0.01. This indicates that the ATMs of banks have a positive and significant effect on performance. Therefore, we accept **H1-1 "Banking innovation in terms of ATMs (ATMs) has a positive influence on bank performance"**.

Thus, in terms of ATM innovation, this result is consistent with the result of Akhisar et al (2015) who examined the effects of electronic banking services on bank performance. They found that the number of ATMs has a higher impact on profitability.

Indeed, ATMs have enabled Tunisian banks to reduce operational costs by limiting the need for human intervention in branches for simple transactions, particularly during the COVID19 crisis. This automation frees up resources that can be reallocated to more strategic activities, such as

financial advisory or wealth management, thereby improving the overall efficiency of banking operations. This reallocation directly contributes to improved profitability (Akhisar et al., 2015; Al-Smadi & Al-Wabel, 2011). ATMs have also helped expand the reach of banking services by providing increased accessibility to customers, resulting in increased transaction volume and revenue generation (Dos Santos & Peffers, 1995; Kumar & Dhingra, 2017).

6.2 Mobile phone and bank's performance

The regression coefficient of the MB variable is positive for the study model, i.e. a value of (Coef = 0.002815 t-student = 1.90; P = 0.060) significant at $p < 0.01$. This indicates that Mobile Banking (MB) has a positive and significant effect on performance. Therefore, we accept **H1-2 "The service and performance of mobile phones have a positive impact on banking performance"**.

Also, for BM this result is consistent with the result of a Capgemini study carried out in 2018 with 10,000 banking customers, 61.8% of respondents say that the digital channel is "vital" for the bank.

Certainly, the service and performance of mobile phones are no longer perceived as a simple addition to traditional banking services, but rather as a central pillar. This increased importance is due to several factors. Customers are looking for convenience and speed in their banking, whether it is managing their accounts, making transfers, paying bills or tracking their transactions. They allow access to these services 24/7, offering flexibility that physical bank branches cannot always guarantee.

6.3 Internet banking and bank's performance

The regression coefficient of the IB variable is positive for the study model, i.e. with a value of (Coef = 0.092012 t-student = 1.85; P = 0.068) significant at $p < 0.01$. This indicates that Internet Banking (IB) has a positive and significant effect on performance. Therefore, we accept **H1-3 "Innovation in the field of internet banking has a positive impact on the performance of banks"**.

This result is consistent with previous research that highlights the positive impact of digital innovation in the banking sector, particularly in online banking. For example, Hernando and Nieto (2006) examined Spanish banks and found that the adoption of online banking services had improved the profitability of financial institutions by reducing operational costs while increasing customer satisfaction and loyalty. Similarly, Deyong and al.(2007) observed that in American banks, digital innovation, and more specifically online banking, not only contributed to reducing transaction costs but also to increasing competitiveness by increasing the overall volume of transactions. These studies illustrate well how digital innovations strengthen the competitiveness and profitability of banks by optimizing costs and meeting the expectations of increasingly demanding customers. The COVID 19 crisis has pushed Tunisian banks to rely more on the automation of their processes such as transfers, balance inquiries, or bill payments. Banks have thus reduced their dependence on physical branches and face-to-face interactions, which has reduced personnel and infrastructure costs. This reduction in costs, combined with the increase in transaction volume, has translated into an improvement in financial performance.

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6.4 Electronic funds transfer and bank's performance

The regression coefficient of the EFT variable is positive for the study model, i.e. a value of (Coef = 0.0256605 t-student = 1.84; P = 0.070) significant $p < 0.01$. This indicates that Electronic Funds Transfer (EFT) has a positive and significant effect on performance. Therefore, we accept H1-4 "Electronic funds transfer has a positive impact on the performance of banks".

Electronic funds transfer (EFT) has a favorable influence on the performance of banks, by optimizing their operational efficiency and reducing associated costs. In addition, it contributes to profitability in the long term.

The adoption of EFT, and more particularly systems such as SWIFT, also gives banks a competitive advantage. By offering efficient and secure fund transfer services, financial institutions can differentiate themselves in the market. This is particularly crucial in an environment where competition from neobanks and fintechs is increasingly strong. Banks that integrate EFT solutions and adopt innovative technologies are better positioned to meet the changing needs of their customers and adapt to new market trends.

Research by Zachariadis and al. (2017) supports this analysis by highlighting the lasting impact that the adoption of technologies such as SWIFT can have on the financial performance of banking institutions. As the banking industry continues to transform, integrating EFT solutions and technological innovations is imperative to remain competitive and meet the growing expectations of customers in an ever-changing financial environment.

7. Discussion of Results

These results confirm our hypotheses H1-1, H1-2, H1-3, and H1-4, validating the idea that digital technology positively impact bank performance. This confirmation aligns with findings from previous research, which has consistently demonstrated a positive correlation between the implementation of financial innovations and improvements in banking performance. The rapid digital shift brought on by the COVID-19 pandemic has further accelerated this transition, emphasizing the benefits linked to FinTech solutions. With traditional banking services disrupted, consumers quickly adapted to contactless payment options and remote financial management solutions, strengthening their trust and reliance on digital banking models.

Samsonov (2017) found that consumer adoption of digital technology —driven by factors such as reduced transaction costs and increased efficiency—has significantly boosted the uptake of these new models. Similarly, Chuang (2016) and Lim (2019) underline the influence of these factors on consumer behavior, as customers increasingly prefer financial services that align with their modern needs and expectations. As financial technology continues to evolve, it is likely that the adoption of FinTech solutions will keep growing, reshaping the future landscape of financial services.

For traditional banks, these findings underscore the need to deepen their investments in digital technologies to remain competitive. Capgemini (2018) emphasizes that banks should focus not only on enhancing the security and reliability of their platforms but also on developing new features to enrich the user experience and stand out in a crowded market. As neobanks and FinTech firms gain traction by offering agile, customer-centric digital services, conventional banks face mounting pressure to meet the increasing demand for digital solutions. Adapting to these expectations is essential for traditional institutions seeking to compete effectively in a market that increasingly favors seamless, efficient digital experiences.

8. Conclusion

In this study, we examined the impact of investment in technological innovations on the financial performance of Tunisian banks during covid-19. The fusion between technology and finance is the best formula to promote this digital inclusion. Today, banks are interested in pursuing strategies to maintain their market share; Better customer relationship management, customization of recent and innovative banking services, counter-offensive strategies such as partnerships and the acquisition of fintech companies such as the start-up flouci acquired by Attijeribank. They have implemented a new marketing concept "bank marketing" to attract as many customers as possible. Moreover, this transition to digital, although essential, is not without challenges. Banks must overcome obstacles such as securing data, protection against cyberattacks, and compliance with regulations, particularly those relating to the confidentiality of information. At the same time, they must ensure that their digital platforms remain accessible and intuitive for all their customers, especially for those less comfortable with digital technologies.

Our contribution lies in analyzing the impact of the most significant financial technologies in recent years and whether the introduction of these innovations presents an opportunity or a threat to the performance of Tunisian banks.

Thus, our study aims to shed light on these complex dynamics by analyzing the specific effects of financial technologies on the performance of Tunisian banks. By assessing both the opportunities and threats that these innovations present, we hope to provide practical recommendations to help financial institutions navigate this constantly changing environment, while maximizing their growth and profitability potential.

In addition, the study of Tunisian banks is considered a real empirical contribution due to the paucity of literature on emerging markets, more specifically on Tunisia.

Although our study makes a significant contribution to the understanding of innovation in the banking sector, it is not without some limitations, as is often the case in research. One of the main limitations is the tendency towards overconfidence observed among some bank employees. This overconfidence may stem from their dominant market position as well as their strong financial performance (Kahn and al. 2018). This situation may give rise to a number of biases. For example, employees may be inclined to overestimate the efficiency of their current processes and neglect the importance of continuous innovation (Tidd & Bessant, 2018). Moreover, such an attitude could lead to a lack of openness towards new ideas and technologies, which could hamper innovation and the adoption of digital solutions (Huang & Wang, 2018). In conclusion, our research constitutes a first step towards a deeper understanding of innovation in the banking sector, while opening the way to many possibilities for further exploration. By analyzing competition between banks through a comparative study and taking into account variables such as organizational culture and the size of the institutions, we would be able to obtain even more relevant and applicable results. These results could, ultimately, help develop more effective strategies to stimulate innovation within financial institutions.

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