

The Impact of Financial Technology Implementation on Banks' Financial Performance: Case Study of Algerian People's Credit Bank (Cpa) from 2016 to 2020

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Received: 03-08-2025

Accepted: 10-10-2025

Published: 01-12-2025

Abstract:

The study aims to highlight the role of financial technology in improving the financial performance of the Algerian People's Credit Bank (CPA) during the period from 2016 to 2020. To achieve the objectives of the study, the descriptive-analytical approach was used. Data collection methods included interviews. The statistical analysis was conducted using the EViews software (version 13). The study concluded that there is a moderate level of financial technology application at the CPA Bank. It also found a statistically significant relationship between financial technology and the financial performance of the bank. Additionally, the study revealed that the dimension of financial technology, represented by the development of transactions using Electronic Data Interchange (EDI), has an impact on the financial performance of the CPA Bank.

Keywords: Algerian People's Credit Bank, financial performance, financial technology, FinTech, exploitation result

1. Introduction

Banks are considered the backbone of project financing and financial intermediation. This has led them to seek the optimal use of technology in financial management within their banking operations. This goal is pursued by intensifying investment efforts in the field of financial technology. As a result, banks are increasingly focused on improving their financial performance, which is measured through various performance indicators. The Banque de Crédit Populaire d'Algérie (CPA) is one of the banks that has witnessed changes in its financial indicators, possibly due to its use of financial technology. Based on this, the following research problem arises: **To what extent has financial technology contributed to improving the financial performance of the Banque de Crédit Populaire Algérie (CPA) during the period from 2016 to 2020?**

To answer these questions, we propose the following hypotheses:

- **There is an acceptable level of financial technology implementation at the Banque de Crédit Populaire d'Algérie (CPA).**
- **The application of financial technology has an impact on the financial performance of the Banque de Crédit Populaire d'Algérie (CPA).**
- **To highlight the extent of financial technology application across various services at the Banque de Crédit Populaire d'Algérie (CPA);**
- **To identify the level of financial technology implementation at the CPA bank;**
- **To assess the bank's reliance on financial performance indicators in evaluating the performance of the CPA bank;**
- **To determine the relationship between financial technology and financial performance at the Banque de Crédit Populaire d'Algérie CPA).**

2. Previous Studies:

Many researchers have addressed the topic of financial technology implementation in banks from various perspectives, resulting in diverse research findings. Therefore, we will present and discuss some studies that are relevant to the subject of this research.

2.1. Presentation of Previous Studies:

We will review some studies related to financial technology and financial performance in the banking and financial sector.

2.1.1. Study of Boukhari's (2022) "The Role of Financial Technology in Enhancing the Performance of Islamic Banks":

The study aimed to explore the role of financial technology in improving the performance of Islamic banks in Malaysia, Qatar, Kuwait, Bahrain, and the United Arab Emirates. It employed a descriptive analytical approach and reviewed the experiences of pioneering countries. The study concluded that financial technology effectively contributes to the sustainable development of the Islamic financial industry.

1.2. Study of Ben Zaid et al.'s (2022) "The Impact of Financial Technology Application on the Profitability of the Banking Sector in Algeria":

The objective of this study was to examine the actual application of financial technology services in Algeria, specifically the number of ATMs and issued bank cards, and their impact on the profitability of the banking sector, measured by return on equity (ROE) using annual data. A statistical and econometric analysis was conducted for the period 2010 to 2022, using EViews software. The study found a significant positive effect of financial technology indicators on ROE. It also noted that the COVID-19 pandemic played a major role in accelerating the adoption of financial technology in Algeria.

1.2.3 Study of Shahd & Abduraseel's (2021) "The Impact of Financial Technology on the Banking Sector in Iraq":

This study aimed to examine the effect of financial technology on the Iraqi banking sector during the period from 2017 to 2018. It adopted a

deductive approach and found that financial technology currently represents an opportunity rather than a threat for the Iraqi banking sector. It also concluded that improved security and trust indicators facilitate the adoption of financial technology and contribute positively by enhancing management quality, financial inclusion, and reducing non-performing loans.

1.2.4 Study of Ness' (2022) "Financial Technology as an Opportunity to Develop Financial Services":

This study aimed to highlight the importance of information and communication technology in financial services and to identify the impact of fintech on the economy. The researcher used a descriptive analytical method and found that the constraints faced by financial services performance contributed to the spread of financial technology. These constraints led to reduced reliance on traditional banking services. Furthermore, the study emphasized that many fintech users lack the necessary internet and ICT skills, and that the absence of legislative frameworks for startups in this field poses additional challenges.

1.2.5 Study of Boumoud et al.'s (2020) "The Role of Financial Technology Innovations in Enhancing the Performance of Islamic Banks":

This study aimed to demonstrate how fintech innovations can improve the performance of Islamic banks. It concluded that such innovations enhance the competitiveness and efficiency of Arab Islamic banks by providing digital tools that boost service quality, strengthen current successes, and increase their presence in international markets.

1.2.6 Study Mohamed Ibrahim's (2017) "The Impact of Financial Technology on the Financial Performance of Commercial Banks in Kenya":

This study sought to investigate the impact of financial technology on the financial performance of commercial banks in Kenya. It followed a descriptive methodology and targeted 35 commercial banks,

collecting primary data from employees via a questionnaire. The researcher used SPSS and multiple regression analysis to analyze the data. The study concluded that financial technology has a strong positive impact on financial performance and that there is a significant positive relationship between banks' profitability (measured by Return on Assets-ROA) and the adoption of financial technology in their operations.

2.2 Discussion of Previous Studies:

The reviewed studies, including the present research, share a common objective: to emphasize the importance and impact of financial technology on the performance of the banking sector. However, each study brings a unique focus. For example, Boumoud's study centered on Islamic banks, while Shahd and Abdulrasool addressed whether FinTech is an opportunity or a threat—an objective that closely aligns with the current research.

Most studies were conducted in Arab contexts, especially Algeria, which supports the relevance of their findings to the current study environment. Exceptions include the works of Boukhari (2022), Ness (2022), and Mohamed Ibrahim (2017), which examined either foreign or mixed environments.

Despite differences in methodology and sample size, all studies targeted the banking sector. While many adopted descriptive and analytical methods, some—such as Ben Zaid (2022)—used econometric and statistical models, and others, like Shahd and Abdulrasool, used a deductive approach.

In general, the studies concluded that FinTech significantly enhances financial performance by enabling a shift from traditional banking services to more innovative, technology-driven offerings. These advancements contribute to cost reduction and broader financial inclusion.

Nonetheless, certain obstacles persist. For instance, Ness (2022) highlighted that customers' lack of digital skills and the absence of regulatory frameworks hinder the full deployment of financial technologies.

3. Theoretical Framework of the Study Variables (Financial Technology and Banks' Financial Performance):

This section addresses the general concepts related to financial technology and the financial performance of banks, focusing on the relevant performance indicators.

3.1 . Financial Technology (FinTech)

Due to the increasing global reliance on knowledge-based economies and the emergence of knowledge networks, the world has witnessed a significant digital transformation. Accordingly, this section will cover the concept of financial technology, its importance, objectives, and components.

3.1.1 The Concept of Financial Technology

According to the Financial Stability Board (FSB), financial technology refers to financial innovations using modern technological means. These innovations may result in the creation of new business models, applications, processes, or products that significantly impact financial markets and diversify the delivery of financial services (Kerboua, 2018, p. 3). The International Monetary Fund (IMF) defines FinTech as technologies that have the potential to transform financial services by enabling new business models, applications, processes, and products (Baba Chikako, 2020, p. 12). Based on these definitions, financial technology can be defined as a new sector within the financial industry that provides services, applications, and innovative products through the use of information and communication technologies, with a tangible impact on financial markets and institutions.

3.1.2. The Importance of Financial Technology

FinTech is currently of great importance, which can be summarized as follows (Saihi, 2018, p. 93):

- Facilitating access to alternative financing sources for enterprises;
- Enhancing financial stability through compliance with regulatory requirements and risk management;
- Diversifying economic activities by enabling access to financial services for unbanked populations;
- Improving the efficiency of government operations through electronic payment methods, prompting the need for reforms in consumer protection and data security;
- Facilitating international trade and remittances by providing efficient and low-cost cross-border payment mechanisms.

3.1.2 Financial Technology Services

FinTech services can be summarized in the following categories:

3.1.3.1 Access to Electronic Banking Services:

- Data entry, electronic signatures, and remote transfer orders (single or bulk);
- Real-time account monitoring;
- Tracking the status of transfer orders sent to the bank;
- Allowing customers to download and send their RIB (Bank Identification Statement) electronically;
- Requesting and sending checkbooks;
- Currency conversion through e-banking platforms.

3.1.3.2 Payment Services: These include a range of banking operations offered via FinTech, providing various payment methods (Allemawi, 2020, p. 186):

- Simplifying individual payments via mobile;
- Conducting low-cost international money transfers;
- Providing various online payment methods;
- Managing payment flows related to e-commerce;

- Currency exchange with reduced costs and simplified peer-to-peer payments.

3.1.3.3 Digital Lending: Digital lending platforms provide loans to individuals and SMEs online, offering quicker and easier access to funding compared to traditional banks. According to Narayan, such platforms support businesses that cannot access loans due to traditional banking constraints (Narayan, 2019, p. 89).

3.1.3.4 Investment and Financing: Attracting individual savings through simplified investment offers, offering crowdfunding and equity investment platforms and helping individuals analyze risk and manage their savings remotely through online tools.

3.1.3.5 Internet-Based Retail Banking Services: Bank and corporate services such as Blockchain (technology for secure transaction recording), solutions for information systems, risk, and tax management (Abdellat, 2000, p. 70), services based on (Big Data) to enhance customer relationship management (buying behavior, savings habits, creditworthiness) and detect fraud through geolocation, encryption, and behavioral analysis (Allemawi, 2020, p. 186).

3.1.3.6 Payment Orders via Electronic Data Interchange (EDI): This refers to remote data exchange between the company and the bank via the bank's e-platform.

3.1.3.7 (Mobile Payments and Digital Wallets: Smartphone-based payments and digital wallets continue to thrive, facilitating daily transactions and reducing reliance on cash. According to Chuen, these technologies allow individuals to make complex payments with minimal effort, fostering more seamless commercial environments (Chuen, 2017, p. 120).

3.1.3.8 Financial Analytics (Big Data & AI): Financial analytics and artificial intelligence are critical FinTech domains. AI helps analyze large volumes of financial data to provide insights that support financial decision-making. According to Brynjolfsson &

McAfee, AI enhances financial efficiency through improved forecasting and evaluation techniques (Brynjolfsson & McAfee, 2014, p. 35).

3.2 Banks' Financial Performance

Banks continually strive to achieve growth and generate results with optimal efficiency and effectiveness. This is done through the use of control and management tools that rely heavily on financial performance indicators. Performance evaluation is a continuous and systematic process aimed at measuring and judging the outcomes achieved, comparing them to past results and future objectives (Khalis, 2004).

3.2.1 Key Indicators for Measuring Bank Financial Performance:

The importance of performance evaluation in banks has grown in recent years, in line with the expansion of banking activities and financial transactions. These indicators have become crucial for decision-makers to verify the optimal use of resources.

3.2.1.1 Operating Profit (Exploitation Result / Operating Result):

This is a key indicator of a bank's performance in its core activities. It represents the profit or loss generated from basic operational activities before accounting for taxes and extraordinary financial expenses.

$$\text{Operating Profit} = \text{Total Operating Revenues} - \text{Total Operating Expenses}$$

Operating revenues include: Interest received on loans, Commissions (e.g., banking service fees), Profits from financial operations (e.g., money market, foreign exchange) and Investment income (Vernimmen, 2014, p. 145)

Operating expenses include: Interest paid to depositors, Staff salaries, Rent and administrative costs, Loan losses (provisions for doubtful debts)

This result excludes taxes and non-operating gains or losses and helps evaluate how efficiently the bank uses its resources to generate core income.

3.2.1.2 Net Financial Result (Net Profit): This refers to the bank's profit or loss after deducting all expenses, including taxes, operating costs, and provisions. It serves as a comprehensive indicator of the overall financial performance of a banking institution. (Al-Arabi, 2020, p. 112)

3.2.1.3 Return on Equity (ROE): ROE measures the return generated on shareholders' equity and reflects the bank's overall performance—both operational and financial. It assesses how well the bank achieves its goal of maximizing shareholder wealth. Banks typically aim to increase ROE relative to risk levels. (Khaled Mohammed Ahmed Al-Jabri, p. 9)

$$\text{ROE} = \frac{\text{Net Profit}}{\text{Total Shareholders' Equity Revenues}}$$

(Umer Iqbal & Muhammad Usman, 2018, p. 73)

3.2.1.4 Return on Assets (ROA): ROA provides insight into the average profit generated per unit of assets. It serves as a measure of how effectively the bank manages its assets.

$$\text{ROA} = \frac{\text{Net Profit}}{\text{Total RAssets}}$$

(Roy Badar & Asif Saeed, 2013, p. 82)

3.2.1.5 Asset Utilization (AU): This indicator reflects how efficiently the bank uses and manages its assets and financial resources. It also illustrates the relationship between asset investments and generated revenues.

$$\text{AU} = \frac{\text{Total Revenues}}{\text{Total Assets}}$$

3.2.1.6 Profit Margin: This metric measures the net income generated for each monetary unit of total revenue, reflecting the bank's efficiency in managing and controlling its costs.

$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{Total Revenues}}$$

3.2.1.7 Liquidity Indicators: Liquidity indicators measure the bank's ability to convert its assets into cash without incurring significant losses.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

(El-Ghali, 2009, p. 179)

$$\text{Current Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}}$$

$$\text{Deposit Ratios} = \frac{\text{Demand Deposits}}{\text{Current LTime and Savings Depositsliabilities}}$$

4. Tools and Methodology:

Interviews, observation, and annual financial reports related to the Algerian Popular Credit Bank (CPA) were used to collect the study's data.

4.1. The study variables were as follows:

Dependent Variable: The operating result (REXP), which is considered one of the key indicators of financial performance measurement for banks.

Independent Variables: Elements of financial technology obtained from reports at the level of the Central Bank for the Algerian Popular Credit Bank (CPA), which include:

- Electronic Banking Services (SBD)
- Electronic Data Interchange (EDI) Transfer Order Services

The statistical software EViews version 13 was used to process the study data and obtain the final results.

The descriptive approach was adopted for the theoretical part, while the case study method was applied in the field study.

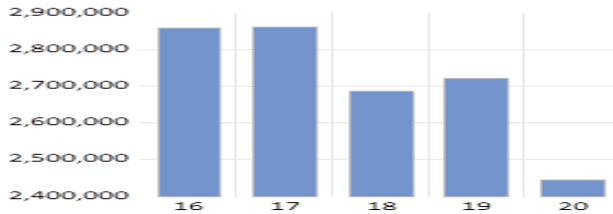
4.2. Discussion and analysis of results:

We will present and discuss the results obtained through the analysis of the data collected from the bank using the statistical software EViews version 13.

4.2.1 First Hypothesis "There is a moderate level of fintech application at the Algerian Popular Credit Bank (CPA) "

The results related to the volume of EDI services at the Algerian Popular Credit Bank were presented through the following Figure (1).

Fig 1. Level of SBD Services at the Algerian Popular Credit Bank (CPA)



Source: Prepared by the researchers, based on the results of EViews 13 software.

From Figure1we observe that electronic banking services (SBD) were high in 2016, reaching a volume of 9,276 then decreased in 2017 to 5,716 and continued to decline significantly in the following year (2018) to 1,211However, they started increasing again in 2019, reaching 3,570, and then recorded a sharper rise in 2020, reaching 8,711.

This sudden increase can be explained by the partial limitation of traditional banking services and the shift towards remote banking services during the early period of the COVID-19 pandemic.

Fig 2. Level of EDI Services at the Algerian Popular Credit Bank (CPA)



Source: Prepared by the researchers, based on the results of EViews 13 software.

From Figure 02we observe that the volume of EDI servicesin 2016 reached 2,857,205, then declined in 2018 to 2,685,194A slight increase was recorded in 2019, with the volume reaching 2,721,698

but in 2020, there was a significant decrease, with the volume dropping to 2,444,886

From the above analysis, it is clear that the bank generally relies on financial technology services through SBD and EDI. However, there is a noticeable fluctuation in the volume of these services.

In conclusion, based on the above findings, the hypothesis stating that “There is a moderate level of fintech utilization at the Algerian Popular Credit Bank (CPA)” is confirmed.

2.5 Second Hypothesis “There is an effect of fintech elements on the financial performance of the Algerian Popular Credit Bank (CPA).”

To determine the effect of fintech elements on the financial performance of the Algerian Popular Credit Bank (CPA), it is necessary first to establish the existence of a relationship between financial technology and financial performance.

Then, the impact of the fintech dimensions on the bank's financial performance will be examined through the multiple regression model. The results obtained are presented in the following table.

Table 1. Results of the Improved Regression Model:

Dependent Variable: REXP_B, Sample: 2016-2020, Included observations: 5				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDI	-33.311	9.836	-3.386	0.042
C	149059914.826	26736272.288	5.575	0.011
R^2	0.792	Mean dependent var		58654744.2
Adjusted R^2	0.723	S.D. dependent var		6353016.965
S.E. of regression	3340288.323	Akaike info Criterion		33.170
Sum squared resid	33472578250963.34	Schwarz Criterion		33.013
Log likelihood	-80.925	Hannan-Quinn criter.		32.750
F-statistic	11.469	Durbin-Watson stat		1.868
Prob(F-statistic)	0.042			

Source: Prepared by the researchers, based on the results of EViews 13 software.

From the table above, we observe the following:

- **R² (Coefficient of Determination):** The independent variables explain 90.4% of the variance in the dependent variable.
- **Pt (P-values):** The probability of error (significance level) for the two variables EDI and SBD are 0.052 and 0.285 respectively. Since both values are greater than 0.05, they are not statistically significant.
- **F (Fisher Test):** The overall model significance (general interpretation) is 9.4611.
- **PF (P-value of the F-test):** The overall model's statistical significance is 0.0955.
- **Durbin-Watson Statistic:** The value is 2.799, indicating the presence or absence of autocorrelation in the model residuals.
- We note that there is an effect of fintech elements on the operating result.

The estimated regression equation is:

$$\text{REXP} = -34.302 \times \text{EDI} - 624.528 \times \text{SBD} + 155,306,445.04$$

- **Improving the Regression Model:** This is illustrated in the following Table 2:

Table 2. P-values:

Dependent Variable: REXP_B, Sample: 2016-2020, Included observations: 5				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDI	-33.311	9.836	-3.386	0.042
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F-statistic	11.469	Durbin-Watson stat		1.868
Prob(F-statistic)	0.042			

Source: Prepared by the researchers, based on the results of EViews 13 software.

We observe that the p-value (PF) of the overall model significance equals 0.095, which is greater than 0.05. Also, the value of the Durbin-Watson statistic is 2.799, which is greater than 2, meaning the value falls within the ... region. To confirm this, we perform the Breusch-Godfrey test, and we obtain the following table:

Table 3. P-values:

F-statistic	10.126	Prob. F(1,1)	0.193
Obs R-squared	4.550	Chi-Square(1) Prob.	0.032

Source: Prepared by the researchers, based on the results of EViews 13 software.

We find that the p-value associated with the variable SBD is 0.19, which is greater than 0.05 .

Therefore, we will eliminate the non-significant independent variables, namely the variable (SBD), from the model in order to obtain the results of the improved model, as shown in the following Table 4:

Table 4. Results of the Improved Regression Model:

Dependent Variable: REXP_B, Sample: 2016-2020, Included observations: 5				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDI	-33.311	9.836	-3.386	0.042
C	149059914.826	26736272.288	5.575	0.011
Adjusted R ²	0.792	Mean dependent var		58654744.2
S.E. of regression	0.723	S.D. dependent var		6353016.965
Sum squared resid	3340288.323	Akaike info Criterion		33.170
Log likelihood	33472578250963.34	Schwarz Criterion		33.013
F-statistic	-80.925	Hannan-Quinn criter.		32.750
Prob(F-statistic)	11.469	Durbin-Watson stat		1.868
Adjusted R ²	0.042			

Source: Prepared by the researchers, based on the results of EViews 13 software.

From the previous table, we observe that the overall statistical significance of the model is $0.04 < 0.05$, which means that the model is statistically significant. We also notice that the p-value for the variable EDI is $0.04 < 0.05$, which indicates that the variable (SDI), related to financial technology, has a statistically significant impact on the bank's financial performance through the exploitation result. We obtain the following improved model:

$$\mathbf{REXP = -33.311 * EDI + 149,059,914.826}$$

Through this equation, we can predict one of the bank's financial performance indicators — namely, the bank's operating result — based on the financial technology element (EDI) used in the bank. This means that for every one-unit change in the volume of financial technology operations (EDI), the operating result, which reflects the financial performance of the Banque de Crédit Populaire Algérien (CPA), changes by 33.311 units.

Using this equation, we can also project future values for the time series over the next five years beyond the observed period and forecast the independent values.

Therefore, we accept the hypothesis stating that: "There is an effect of financial technology operations on the financial performance of the Banque de Crédit Populaire Algérien (CPA)."

5. Conclusion

The emergence of financial technology (FinTech) has significantly contributed to the financial development of financial institutions, including commercial banks—particularly Algerian commercial banks, such as the Banque de Crédit Populaire Algérien (CPA). Financial technology is considered an effective tool for improving fund management and organizing financial operations. It provides secure and convenient payment methods, such as mobile banking applications and digital wallets, enabling individuals and businesses to carry out financial transactions easily and quickly.

In addition, FinTech allows companies to analyze financial data more accurately and rapidly, enabling them to make better, data-driven

decisions based on financial figures and forecasts. It also helps companies improve financial risk management and reduce the probability of losses.

Furthermore, financial technology enhances transparency and financial inclusion, as it allows individuals and businesses to access financial services regardless of their location and at a lower cost. This contributes to promoting economic growth and achieving sustainable development.

The use of financial technology has a significant impact on financial performance across many sectors and companies. Through FinTech, financial operations are improved and accelerated, costs are reduced, and efficiency is increased. This is the conclusion reached through our research.

• **Study Findings:**

The Banque de Crédit Populaire Algérien relies more heavily on the EDI service compared to other electronic banking services (SBD).

There is a relationship between financial technology and financial performance at the CPA Bank.

The FinTech dimension, represented by the development of transactions using EDI, has an effect on the financial performance of the CPA Bank.

• **Recommendations:**

Work on providing the infrastructure necessary to achieve digital transformation at CPA Bank in order to adopt various FinTech services.

The bank should adopt FinTech solutions and modernize its procedures to keep pace with technological advancement.

Algerian banks, including the CPA Bank, should open up to research and development laboratories to enhance the integration of FinTech in banking operations, thereby improving the bank's financial performance.

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