

The Impact of FinTech on Financial Performance and Client's Satisfaction Evidence from Egyptian banking sector Eman Salman¹

Abstract:

Banking performance cannot be good without the Banking clients' satisfaction. The study investigates the impact of FinTech on financial performance and client satisfaction. A sample of seven banks represented in Egyptian banks over the period from 2016 to 2020, in addition to 396 banking clients. Finally, the study found a significant impact both of "banking investments on FinTech" and "number of Fitch's drives" on the rate of return on bank assets under the types of ownership (Domestic/Foreign/Mix) as a control variable. In addition to the significant impact of FinTech service characteristics on bank clients' satisfaction. Egyptian banks should consider financial technology as one of the tools of non-price competition that works to support the competitive position of the bank that agree with (Kemunto, and Kagiri, 2018; Chen et. al. 2021). In addition, the study recommends expanding studies related to the regulatory aspects of financial technology, which is known as RegTech.

Keywords:

FinTech; Financial Performance; Clients Satisfaction; Egyptian banking sector

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1. Introduction

1.1 The framework of the study problem

Banks are under pressure from rapid technological and societal development, which has altered consumer behavior and altered customer relationship management - CRM- (Kotarba, 2016). The present period is considered crucial for financial services practitioners. Due to the massive number of technical advances that have altered the way businesses operate, money is transferred, and daily transactions are conducted, the FinTech (financial technology) industry has grown to be one of the most significant industries receiving support from decision-makers globally. (Agyemang-Badu et al. 2018).

Since the COVID-19 pandemic's effects have spread globally, it has transformed how businesses use digital technology overnight, making an investment in FinTech (financial technology) more appealing (W'ojcik and Ioannou, 2020). The banking industry has been impacted both positively and negatively, creating opportunities and threats for banks (Chen et al.2021).

Despite the large economic size of Egypt based on many factors, the most important of which is the population and its growth rate, in addition to the old Egyptian banking system that dates back to the eighteenth century, there is a poor in the rates of financial inclusion, as the percentage of the population with bank accounts is still decreasing. About 20% of the total population of Egypt, which explains the high rates of the informal economy in the Egyptian economy, which led to the emergence of many initiatives to encourage individuals and

companies to adopt banking solutions through the use of financial technology.

The study seeks to analyze and examine the impact of entering banking services through FinTech on the financial performance of Egyptian banks from the side and customer satisfaction with banking services in the light of those technology services. The study includes two types of analysis, quantitative and qualitative, which is a rare trend in studies that deal with financial technology.

1.2 Literature Review

As one of the breakthroughs of the Fourth Industrial Revolution, the FinTech (Financial Technology) paradigm enabled the attack of a huge variety of technologies. It has become easier and less expensive to connect clients to financial services and allow them to save and borrow via mobile phone accounts than it is to open official financial accounts, which enable clients from excluded groups to access financial services. Additionally, financial technology enables its users to conduct all financial transactions electronically, including payment for goods and services. (Bayón and Vega, 2018; Ashta and Biot-Paquerot, 2018); Studies can be classified into two groups.

1.2.1 Banking Performance

(Ky et al. 2019) discovered a substantial positive and statistically significant link between banks adopted mobile money and their performance across a range of bank profitability, efficiency, and stability proxies. This study demonstrated how bank specialty and size have an effect on this

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connection. (Chen, 2020) found that, overall bank efficiency has improved since Internet banking.

(Singh et al., 2021) The purpose of this study was to determine the influence of financial technology deployment on the profitability of Indian banks; the findings indicate that FinTech adoption has a substantial beneficial effect on bank profitability.

On other hand (Siek and Sutanto, 2019) investigated the impact of FinTech on traditional banks in Indonesia's banking industry. The data indicated that FinTech payment has harmed banks; FinTech startups have adopted and developed digital methods for adopting and creating apps that provide a high degree of client satisfaction. Also (Phan et. al., 2021) that the growth of FinTech firms negatively influences bank performance.

In the same context; (Putri, et. al. 2019) compares profitability levels before to and following the advent of FinTech products. The study adds to the body of knowledge in the FinTech sector on the profitability impact of introducing FinTech products. Also (Phan et al. 2020) discovered that the expansion of FinTech businesses has a detrimental effect on bank performance.

1.2.2 Client Satisfaction

There is great interest in banking client satisfaction; (Addai et al. 2015) examined the relationship between electronic banking services and client satisfaction in Ghana; the study established the beneficial effect of electronic banking's

dependability, availability, and convenience on client satisfaction. On other hand (Awoke, 2015) according to empirical data from banking industry saving account clients established a strong link between service quality and client satisfaction. (Worku et al. 2016) examined the effect of electronic banking on customer satisfaction in the Ethiopian banking industry and discovered that electronic banking increased client satisfaction.

The purpose of (Nyoni et al., 2017) study was to determine how electronic service quality affects client satisfaction in Botswana's commercial banking sector. Using questionnaires to collect primary data, discovered that e-service quality is a very strong predictor of client satisfaction in the commercial banking industry.

Also (Alwi et al., 2019) examined many factors impacting client satisfaction and discovered that security and privacy are the most important factors influencing satisfaction with FinTech mobile payments, followed by service quality, information presentation, and simplicity of use.

(Zouari and Abdelhedi, 2021) examined the effect of digitalization on client satisfaction as a measure of service quality. Five elements of service quality, confidence, compliance, digitization, tangibles, and human skills were identified as having a positive and substantial influence on bank client satisfaction, with the exception of tangibles.

1.3 Study Problem

According to (Siek and Sutanto 2019) that FinTech payment has harmed traditional; In addition to FinTech startups have adopted and developed digital methods for adopting and creating apps that provide a high degree of client satisfaction. So; The study's problem stems from the competition that banks face today as a result of their electronic lifestyle orientation, as well as the need to quantify and improve the quality of services they provide, as well as to identify and address deficiencies in order to increase client satisfaction and market share. As a result, we may express the study's problem as follows:

How can FinTech services improve each of banking performance and client's satisfaction?

1.4 Study Hypotheses

H₁₍₀₎ There isn't a significant impact of investment FinTech on banking performance.

H₂₍₀₎ There isn't a significant impact of FinTech services characteristics on bank client's satisfaction.

2. Methods

2.1 Study design

The study includes two main sections: quantitative and qualitative analysis, which complement each other. The financial performance of the bank cannot be good without the clients' satisfaction. Where financial technology is seen as an

intermediate variable between investment banking and client satisfaction.

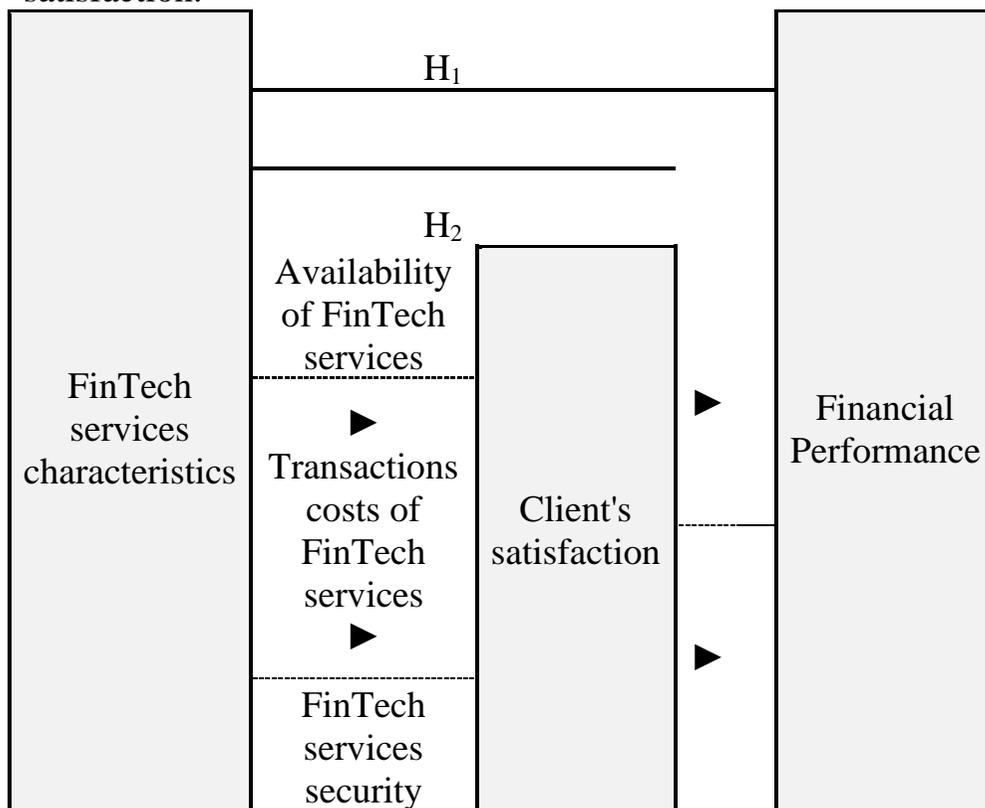


Figure No. (1) Study design

2.2 Study variables

According to the study design, which includes both quantitative and qualitative analysis, the study variables are categorized in this way.

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2.2.1 Study variables for quantitative analysis

The variables in the study were determined by the independent and dependent variables shown in the following table:

Table (1): Study variables for quantitative analysis

Independent Variables	$I_{FinTech}$	Banking Investments on FinTech according to the statement of financial position
	$S_{FinTech}$	Number of services provided based on FinTech according to the license of the Central Bank of Egypt
	$A_{FinTech}$	Availability of FinTech services according to a Number of Fitch's drives (ATMs; Banking application; Contactless cards; Credit cards; Debit cards; E-wallets; Internet Banking; Mobile Payments; Phone Banking ; POS).
Dependent Variable	ROA	Rate of Return on Bank Assets
Control Variables	DEP	the log value of the deposits
	AGE	the age of the bank
	OWN	The ownership (Domestic/Foreign/Mix).

The study population is the banks listed on the Egyptian Stock Exchange, and there are thirteen listing banks, but because of the conditions of regularity and stability of the time series of the study data, data for banks that suffer from severe fluctuations in their profitability were rejected.

Data were collected for the period from 2016 to 2020 for the following banks: Abu Dhabi Islamic Bank- Egypt; Commercial International Bank (Egypt); Credit Agricole Egypt;

Egyptian Gulf Bank; Export Development Bank of Egypt; National Bank of Kuwait- Egypt; Qatar National Bank Alahly.

The study test the stationary of data to ensure that the mean and variance were invariant according to a unit root test, based on GRET software package (Gnu Regression, Econometrics and Time-series Library), the stationarity of the time series of the basic independent and dependent indicators at level zero was evaluated according to the constant level. This was done through the Augmented Dickey–Fuller (ADF), Philips–Perron (PP), Im, Pesaran and Shin W-stat (IPSW), Levin, and Lin and Chu t (LLC) tests at a significance level of less than 0.05.

2.2.2 Study variables for qualitative analysis

The variables in the study were determined by the independent and dependent variables shown in the following table:

Table (2): Study variables for qualitative analysis

Independent Variables	A _{FinTech}	Availability of FinTech services
	C _{FinTech}	Transactions costs of FinTech services
	S _{FinTech}	FinTech services security
Dependent Variable	CS	Clients Satisfaction

3. Data analysis and Results

3.1 First hypothesis test

The study used quantitative analysis to test the first hypothesis of the study. By analyzing the stationary data in order to ensure that the mean and variance are invariant

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according to the unit root test. It can be revealed that the stationary of the time series of the basic independent and dependent indicators is at level zero according to the constant level.

The study applied to a sample of seven banks out of thirteen banks listed on EGX represented by Egyptian banks over the period from 2016 to 2020. The study used panel data analysis to examine this hypothesis. Under the following control variables: It is the size of the bank according to the log value of the value of the deposits, the age of the bank, and the ownership (Domestic/Foreign/Mix).

Table no. (1): Model 1

Model 1: WLS, using 35 observations

Included 7 cross-sectional units

Dependent variable: ROA

Weights based on per-unit error variances

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-6.38238	3.73342	-1.710	0.0984	*
A	1.12039	0.304115	3.684	0.0010	***
S	0.241473	0.188861	1.279	0.2115	
I	0.0370601	0.0177992	2.082	0.0466	**
DEP	0.164141	0.522085	0.3144	0.7556	
AGE	-0.00782808	0.0720913	-0.1086	0.9143	
OWN	2.30317	0.596747	3.860	0.0006	***

Statistics based on the weighted data:

Sum squared resid	32.47191	S.E. of regression	1.076899
R-squared	0.924721	Adjusted R-squared	0.908589
F (6, 28)	57.32472	P-value(F)	1.95e-14
Log-likelihood	-48.35083	Akaike criterion	110.7017
Schwarz criterion	121.5891	Hannan-Quinn	114.4600

Statistics based on the original data:

4.445762 S.D. dependent var	8.944571 Mean dependent var
1.697599 S.E. of regression	80.69159 Sum squared resid

According to table no. (1), the study doesn't found a significant impact of some variables on rate of return on bank assets. Therefore, the test will be re-tested after deleting this variable.

Table no. (2): Model 2

Model 2: WLS, using 35 observations

Included 7 cross-sectional units

Dependent variable: ROA

Weights based on per-unit error variances

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-6.03974	0.785659	-7.687	<0.0001	***
A	1.35017	0.159664	8.456	<0.0001	***
I	0.0401238	0.0150447	2.667	0.0121	**
OWN	2.40896	0.355601	6.774	<0.0001	***
Statistics based on the weighted data:					
Sum squared resid	32.14031	S.E. of regression		1.018226	
R-squared	0.921700	Adjusted R-squared		0.914123	
F(3, 31)	121.6380	P-value(F)		3.12e-17	
Log-likelihood	-48.17120	Akaike criterion		104.3424	
Schwarz criterion	110.5638	Hannan-Quinn		106.4900	
Statistics based on the original data:					
Mean dependent var	8.944571	S.D. dependent var		4.445762	
Sum squared resid	100.5557	S.E. of regression		1.801036	

According to Table No. (2), the study found a significant impact both of "banking investments on FinTech" and "Number of Fitch's drive" on the rate of return on bank assets under The ownership (Domestic/Foreign/Mix) as a control variable. Now, the study rejected the Null hypothesis; In return for accepting the following hypothesis

H₁ There is a significant impact of FinTech on banking performance.

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3.2 Second hypothesis test

The study used qualitative analysis to test the second hypothesis of the study. Data were collected through a questionnaire on the clients of the two banks in Cairo and Giza, and the sample size was 396 banking clients.

The study self-designed a questionnaire for bank clients. The questionnaires were composed based on the five-point Likert scale, from strongly disagree (one point) to strongly agree (five points) continuum. There were seven questions divided into four sections. (Section A: availability of FinTech services; section C: transactions costs of FinTech services; section S: FinTech services security; section CS: clients satisfaction).

The study used Cronbach's alpha to test the reliability coefficient of the questionnaire; the total alpha coefficients was 0.8338. In addition to the use of correlation coefficients between questionnaire sections; there was a significant correlation at the 1% level.

Table no. (3): Pearson Correlation for questionnaire sections

	Availability of FinTech Services	Transactions Costs of FinTech Services	Clients Satisfaction	FinTech Services Security
Availability of FinTech Services	1			
Transactions Costs of FinTech Services	0.850855	1		
Clients Satisfaction	0.780988	0.729834	1	
FinTech Services Security	0.602108	0.571256	0.144174	1

The study used regression analysis to test this hypothesis. According to Table No. (4), the study found a significant impact of banking investments on FinTech on the rate of return on bank assets. Now, the study rejected the Null hypothesis; In return for accepting the following hypothesis

Table no. (4): Model3

Model 3: OLS, using observations 1-496

Dependent variable: CS

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	3.32464	0.209558	15.87	<0.0001	***
A	0.566623	0.0271911	20.84	<0.0001	***
C	0.543369	0.0581119	9.350	<0.0001	***
S	-0.968546	0.0442016	-21.91	<0.0001	***
Mean dependent var	2.820565	S.D. dependent var	1.035755		
Sum squared resid	100.6753	S.E. of regression	0.452354		
R-squared	0.810415	Adjusted R-squared	0.809259		
F (3, 492)	701.0480	P-value(F)	3.5e-177		
Log-likelihood	-308.3140	Akaike criterion	624.6280		
Schwarz criterion	641.4543	Hannan-Quinn	631.2329		

According to Table No. (4), the study found a significant impact of both the availability of FinTech services; transactions costs of FinTech services and FinTech services security on clients satisfaction. That agree with (Alwi et al., 2019). Now, the study rejected the Null hypothesis; In return for accepting the following hypothesis

H₂ There is a significant impact of FinTech services characteristics on bank client's satisfaction.

4. Conclusions and Recommendations

4.1 Conclusions

The term “Fintech” is composed of the words “finance” and “technology.”, it also was defined as an interaction between financial service providers and clients, which shows the entire process that is intended for the user. (Amin, 2016), FinTech is also described as a new era of digital finance worldwide that extends from applying artificial intelligence and machine learning to big data and from the use of biometric identification to block-chain technology (Arner et. al., 2018)

According to (Ashta and Biot-Paquerot, 2018) main reasons for expanding of FinTech includes comfort ability of clients with online money; availability (anywhere, anytime); Cheap communication tools (mobile, internet); cheap computing; big data analysis allows efficient targeting of clients; Bank staff lose interest in being locked inside a megabank and Banking regulation sidestepped; So, History of FinTech back to 1950's (Scott and Zachariadis, 2012; Ashta and Biot-Paquerot, 2018).

- 1950's: credit card
- 1960's: ATMs
- 1970's: Telex and SWIFT Transfers
- 1980s: Debit cards
- 1990s: Internet Banking
- 2000s: Mobile Payments, Crowdfunding, Cloud computing
- 2010s: Cryptocurrencies, E-wallets, robot advisors, big data analytics

Technology is really creating value in financial services. (Scott et al., 2017) First, costs reduced. This is not just the processing costs within banks, but also other transaction costs; second, revenues are increased because banking becomes 24/7: Anytime, Anywhere. Nevertheless, a number of challenges remain. The first is the digital divide: young versus old; poor versus rich; rural versus urban. A second problem is with security and privacy. This concerns privacy, hacking, and fraud. Finally, there are issues of discomfort and mistrust (Ashta, and Biot-Paquerot, 2018). The technology moved toward covering the entire client journey, following table show the Risks and opportunities stemming from financial technologies and innovation.

Table no. (5): Risks and opportunities stemming from financial technologies and innovation

Risks	Opportunities
Impact on Consumer sector	
<ul style="list-style-type: none">▪ Data privacy▪ Data security▪ Discontinuity of banking services▪ Inappropriate marketing practices	<ul style="list-style-type: none">▪ Financial inclusion▪ Better and more tailored banking services▪ Lower transaction costs and faster banking services
Impact on banks and banking system	
<ul style="list-style-type: none">▪ Strategic and profitability risks▪ Cyber-risk▪ Increased interconnectedness between financial parties▪ High operational risk – systemic▪ High operational risk– idiosyncratic▪ Third-party/vendor management risk▪ Compliance risk including failure to protect consumers and data protection regulation▪ Money laundering – terrorism financing risk▪ Liquidity risk and volatility of bank funding sources	<ul style="list-style-type: none">▪ Improved and more efficient banking processes▪ Innovative use of data for marketing and risk management purposes▪ Potential positive impact on financial stability due to increased competition▪ RegTech

Source: BCBS, B. (2018). Sound Practices: Implications of FinTech developments for banks and bank supervisors. *Bank for international settlement*.

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The banking sector is one of the most important sectors in the Egyptian economy, along with the tourism sector, the petroleum sector, and the communications sector. These sectors are the leaders in growth in Egypt. However, Egyptian banking sector suffers from low rates of financial inclusion, resulting from the high contribution of the informal sector in business activities. In order to support financial inclusion in Egypt, the initiative of the Central Bank of Egypt was to support the provision of financial technology services, as many technology services are provided in Egyptian banking, which include:

- ATMs
- Banking application
- Contactless cards
- Credit cards
- Debit cards
- E-wallets
- Internet Banking
- Mobile Payments
- Phone Banking
- POS

On the other hand, there are a many of FinTech services don't provided by banks for now; that includes

- Crowdfunding
- Crowdfunding
- Cryptocurrencies

The current study includes two main sections: quantitative and qualitative analysis, according to quantitative analysis; the study found a significant impact both of "banking investments on FinTech" and "number of Fitch's drives" on the rate of return on bank assets under the types of ownership (Domestic/Foreign/Mix) as a control variable. That agree with (Ky et al. 2019; Singh et al., 2021); According to our analysis; the contribution of banking investments on FinTech to the profitability of the bank was 91.41%.

But according to qualitative analysis; the study found a significant impact of FinTech services characteristics (the availability of FinTech services; transactions costs of FinTech services and FinTech services security) on client's satisfaction. That agrees with (Alwi et al., 2019); according to our analysis; the contribution of FinTech services characteristics on client's banking satisfaction was 80.9%.

4.2 Recommendations

Every invention results in change. This shift entails danger. As a result, it is critical to recognize that various inventions generate distinct sorts of hazards. (Abernathy, 1978); It may have happened with the advent of FinTech. Banks are threatened with services FinTech firms. Therefore, banks must be invest in FinTech to ensure long lasting relationships with the client. Banks would have to view FinTech firms as partners rather than rivals in the coming years.

Egyptian banks should consider financial technology as one of the tools of non-price competition that works to support the competitive position of the bank that agree with (Kemunto,

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and Kagiri, 2018; Chen et. al. 2021). (Kemunto and Kagiri, 2018) examined the impacts of Fintech initiatives on the banking sector's competitiveness in Kenya. They discovered that increasing e-banking, mobile banking, agency banking, and process automation will all result in an increase in commercial banks' competitiveness.

Future research needs to look at theories; models and empirical evidence to see how they respond to such change banking performance; therefore, the study recommends the following topics as future research:

1. FinTech integration between banks and companies
2. FinTech risks under Basel IV
3. The impact of FinTech on financial stability
4. The risks of digital transformation in banks
5. The impact of FinTech on banking concentration rates.
6. A comparative study of banking FinTech between international and emerging markets
7. Determinants of evaluating common stock of banks under FinTech

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Appendix No.1: Questionnaire²

section	No.	Situation	strongly disagree	disagree	maybe	agree	strongly agree
A	1	FinTech service minimize the location limitation of financial services					
	2	FinTech service minimize the time limitation of financial services					
C	3	FinTech service minimize the commissions of financial services					
	4	FinTech service minimize the fees of financial services					
S	5	I do not feel afraid when using FinTech service					
	6	Bank accounts cannot be hacked when using FinTech service					
CS	7	I feel satisfaction when using FinTech service					

² Note: The questions are presented in Arabic