

The Impact of Coronavirus Pandemic on Online and Mobile Banking in Egypt

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Abstract- Coronavirus pandemic has affected the global economy. It has changed the daily life and consumer behavior especially in mobile sector. This research paper is focused on the effect of coronavirus pandemic on online and mobile banking in Egypt based on survey of 1343 respondents collected from Egyptian customers in banking and financial sector. The perception of the Coronavirus pandemic that effects on consumers' lifestyle has a positive influence on the variable concerning the attitude toward online and mobile banking services, mediated by other variables such as trust in banks and security of use online and mobile banking. To analysis the gathered data, SPSS as statistical tool was used. The results demonstrated that the technology factors attitude toward using, ease of use, perceived security, perceived usefulness, and trust are all significant toward the impact of coronavirus pandemic on online and mobile banking in Egypt.

Keywords: Coronavirus pandemic, online banking, mobile banking, Technology Acceptance Model (TAM).

I. INTRODUCTION

The coronavirus pandemic has affected many economic sectors worldwide especially banking and financial sector to meet the challenges that people face to diminish the coronavirus spread. The coronavirus effects on the financial or banking institutions, people rely on use of electronic payments, digital channels as well as the change of consumer behavior [1]. The pandemic has pushed people to staying at home and deal with online and mobile banking. Furthermore, the market for mobile banking systems grows because of the increased number of mobile users worldwide. The expected total number of mobile banking users is 1 billion [2]. The financial industry, especially banking survived through the progress of technology and the ability of Internet adaptation. Online and mobile banking is one form of technology adaptation in the banking sector that offer various benefits for banks and bank customers [3]. The advantages of using digital banking include access and perform high volume of transactions as well as the ease of use [4].

Central Bank of Egypt (CBE) facilitate the usage of electronic payment methods. It directed banks to establish their infrastructure and execute transfers of EGP in the same day. It allowed banks to issue electronic wallets free of charge and also creating virtual cards from the wallet [5]. the Central Bank had set standard specifications for the Points Of Sales (POSs) to quick and secure execution of transactions and to support the contactless transactions. The consumer made electronic transactions at point of sale for services and products through online or mobile banking using smart phone or card payment, which called electronic payment [6]. Moreover, central bank of Egypt and Issuer banks encouraged customers to use electronic payment by providing incentives for them to use their electronic payment instruments in purchases [5]. The purpose of this research study is to focus on the impact of coronavirus on both online and mobile banking users and enforcing them to use online and mobile banking to perform their financial services

This research paper is organized as follows. Section 2 shows the related work. Section 3 explains research methodology and research hypothesis. Section 4 discusses data collection and analysis. Section 5 discusses the results of implementing of technology acceptance model (TAM). Section 6 focuses on

validation and reliability of the research model. Finally, the conclusion section that provides a summary of the research and future work.

II. RELATED WORK

Many studies investigated customer acceptance and use internet banking; these studies were based on the Technology Acceptance Model. Although few studies focused on the impact of the Coronavirus on electronic or internet banking sector as mentioned below.

Baicu et al., examined the effect of the COVID-19 pandemic on consumer behavior on the Romanian banking sector. They did survey based on questionnaire including Romanian consumers in retail banking. The sample composed of 738 responses from the metropolitan area retail banking consumers. They used methods for measuring the consumer behavior based on the technological view. These methods included the theory of planned behaviour (TPB), theory of reasoned action (TRA), and the technology acceptance model (TAM) as well as the extended technology acceptance model (TAM2). The authors proposed the research hypotheses using the lifestyle concept to demonstrate the perception of banking customers on the COVID-19 pandemic. These hypotheses focused on utilization internet and mobile banking, trust, ease of use, and safety of internet. The research' results illustrated the impact of COVID-19 pandemic on consumers' lifestyle and it had a positive influence on the attitude toward internet and mobile banking services, via other variables like trust, ease of use and safety of internet and mobile banking use [1].

Sudarsono et al., introduced a research study in Indonesia including conventional banks and islamic banks before and during the Covid-19 pandemic. They investigated effect of perceived ease of use, perceived usefulness, subjective norm, trust, and attitude on customer's Intention for Internet Banking. The authors applied two models the theory of planned behavior and the technology acceptance model. The sample involved 213 respondents form Islamic banks and 410 respondents form conventional banks. The sample study covered 25 provinces in Indonesia. The data collection, through questionnaire including three issues for Internet banking users in Indonesia: First, gathering data about the respondent's demographic background, second and third issues were about the respondent's interest in using internet banking before the Covid-19 pandemic and during the Covid-19 pandemic respectively. Analysis the data focused on partial least square regression. The results showed that all theory of planned behavior constructions predicted customer intention in Islamic and conventional banks before and during the Covid-19 pandemic. In the TAM constructs, the perceived ease of use did not have a significant effect on the intention of customers of both conventional and Islamic banks for using Internet Banking. Perceived usefulness did not affect intention of customers, before the Covid-19 pandemic, but it affected the conventional banks before and during the Covid-19 pandemic. Moreover, a significant relationship found between trust and customer intention to use internet banking, which demonstrated that the customers still saw the internet banking as a risky platform [7].

Moulton et al., presented a study for evaluating people's use and acceptance of technology and how this influences their transaction behavior in the banking sector in Jamaica. The aim of this study was to obtain some insights about the factors that influence acceptance and use of technology by the Jamaican consumer during the COVID-19 pandemic to gain a competitive edge in the market. The authors examined how six variables including perceived ease of use, perceived usefulness, security and privacy, perceived enjoyment, internet connectivity, and amount of information and the independent variable use online banking. The sample of people who use the banking sector was 1,067 respondents. A questionnaire was used to gather the data from people who did transaction with various banks in Jamaica. The questionnaire included demographic data, use of Technology and banking-transaction behavior. The data analysis was based on SPSS (Statistical Packages for the Social Sciences). This study found from the six variables examined that the online or internet banking was influenced by perceived ease of use, and perceived usefulness, and amount of information. The most influence on using internet banking was the perceived ease of use. Thus, the issue of COVID-19 pandemic illustrated the significant of use internet or online banking because it facilitated the social distancing that reduced the spread of the virus [8].

III. RESEARCH METHODOLOGY

Our research model was developed based on the technology acceptance modelling (TAM) approach with perceived trust, security, and attitude towards using online and mobile banking. The Technology Acceptance Model was used to study user acceptance of technology. The TAM is focused on the user acceptance of technology, and it is a widely applied model. People tend to use the system or not if they believe the usefulness and the ease of use of this system. Thus, the TAM model deals with two important

factors influence that influence the user's decision. These factors are perceived usefulness (believe that using a new system would enhance the user job); perceived ease-of-use (believe that using a new system would be free from mental and physical effort) [9] [10].

Tang et al., applied extended TAM in a mobile banking system that is different from the previous studies. This study introduced "perceived credibility" as a new factor that focused on the user's privacy and security concern in the acceptance of mobile banking, and examined the impact of computer self-efficacy on intention to use mobile banking. The results supported the extended TAM for predicting users' intention of mobile banking systems, and illustrated the significant impact of computer self-efficacy on behavioral intention through perceived: (1) Usefulness, (2) ease of use, and (3) credibility [11]. The proposed model is shown in figure 1 which represents five research hypotheses.

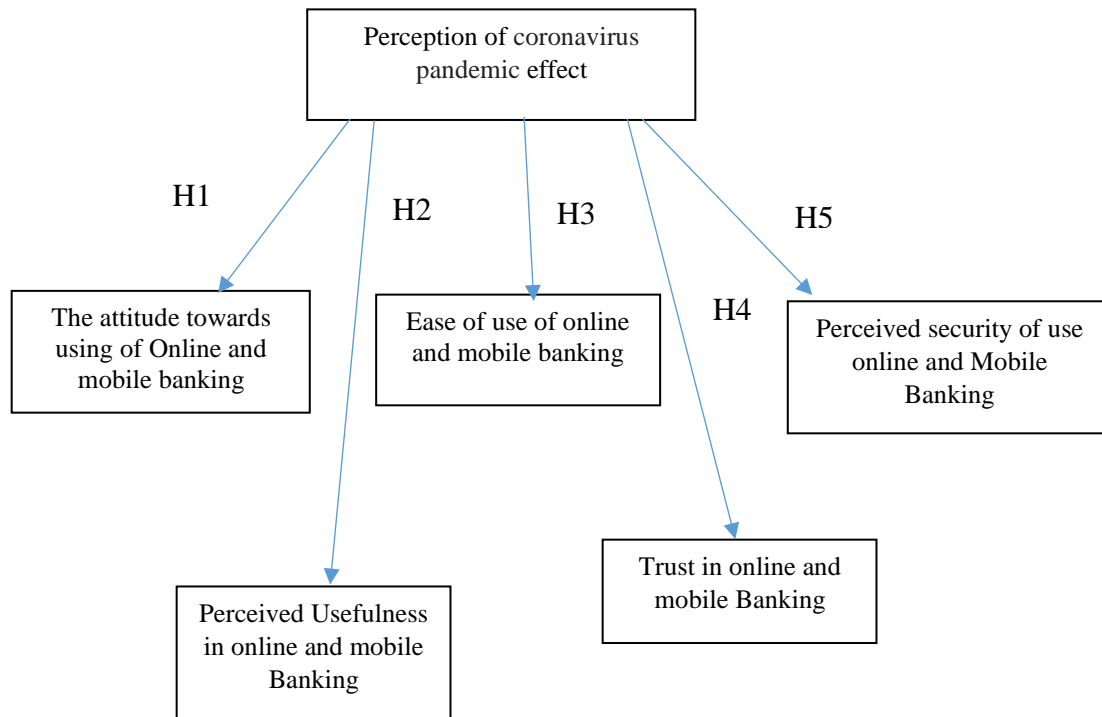


Figure 1: Proposed model

The research Hypothesis

H1. There is a positive relation between the corona virus effect and the attitude toward using online and mobile banking.

H.2 There is a positive relation between the corona virus effect and the ease of use of online and mobile banking.

H.3. There is a positive relation between the corona virus effect and the Perceived usefulness in online and mobile banking.

H.4 There is a positive relation between the corona virus effect and the trust in using online and mobile banking.

H.5 There is a positive relation between the coronavirus effect and the perceived security of using online and mobile banking.

IV. DATA COLLECTION AND ANALYSIS

To study the impact of coronavirus on consumer behavior in online and mobile banking and validating the proposed research model, A questionnaire survey was conducted to gather using the

Google Form. It was sent through Facebook, WhatsApp, telegram and E- mail or met the consumer face to face. After five months of collecting the data, the total number of respondents became 1343. The questionnaire used likert scale which is the most widely used scale in the survey, the approach of five level likert items are Strongly agree, agree, undecided, disagree, strongly disagree. The questionnaire was based on two parts. The first part was demographic questions about (gender, age, educational level, income, Mobile banking usage, Frequency of usage per month) and the second part included the items for measuring perceived usefulness, perceived ease of use, trust, perceived security, and attitude toward using were based on TAM model. The constructs measurements of this research model are presented in the Appendix A.

Sampling and Analysis

Table 1 shows the characteristics of the demographic sample (1343). The age ranged from 16 to 70 years consisted of 59% males and 41% females, majority of the respondents were between 25-40 and 40-60 years old and most of them have higher education; The monthly income of 39.9% of the respondents was between 4000-6000, 26,6% of the respondents had a monthly income between 2000-4000. The survey indicated that 43.4% of respondents used online and mobile banking less than one year, and 37.9% also used online and mobile banking from one year to three years, 45.4% of the respondents used online and mobile banking for one to two transactions per month, 30.5% of the respondents the frequency use rang from three to four transactions

Table 1: Demographic characteristics of survey respondents

Demographic profile	Characteristics	Online Banking Users	
		Frequency	Percentage
Gender	Male	793	59
	Female	550	41
Age	16 - 25	290	21.6
	25 < 40	488	36.3
	40 < 60	417	31.1
	> 60	148	11
Educational Level	High School	145	10.8
	High Diploma	169	12.6
	Bachelor's degree	1029	76.6
Income	under 2000 EGP	262	19.5
	>2000 < 4000 EGP	357	26.6
	>4000 < 6000 EGP	536	39.9
	>6000 EGP	188	14
Online and mobile banking usage	Does not use	94	7
	Less than 1 year	583	43.4
	Between 1 and 3 years	509	37.9
	Over 3 years	157	11.7
Frequency of usage per month	None	94	7
	1- 2 transactions	610	45.4
	3- 4 transactions	409	30.5
	5- 6 transactions	230	17.1

Table 2 shows the second part of the questionnaire, the measurement instrument which developed based TAM approach to demonstrate the percentages of the descriptive in the table 2. There is a list of items under 6 constructs which are incorporated in the proposed model, trust, perceived security, usefulness, ease of use and attitude. These items were measured on a Likert-type scale with anchors ranging from “1” (strongly disagree) to “5” (strongly agree).

Table 2. Research variables and descriptive statistics values

Construct	Item	Scale	Value
The impact of Covid19 (IC)	Is there an impact of Covid 19 in your lifestyle?	1- Strongly disagree	3.4
		2- Disagree	4.3
		3- Undecided	2.1
		4- Agree	45.8
		5- Strongly agree	44.4
	Is there an impact of Covid 19 in using mobile banking services?	1- Strongly disagree	2.9
		2- Disagree	3.1
		3- Undecided	2.3
		4- Agree	46.3
		5- Strongly agree	45.4
Attitude toward using of mobile banking	Is it a good idea to use mobile banking services?	1- Strongly disagree	2.1
		2- Disagree	8.6
		3- Undecided	2.5
		4- Agree	44.3
		5- Strongly agree	42.5
		6-	
	Do you use mobile banking services more frequently than classic banking services during covid19?	1- Strongly disagree	4.5
		2- Disagree	10.8
		3- Undecided	3.1
		4- Agree	45.9
		5- Strongly agree	35.7
Perceived Security of Mobile Banking use	Do you have enough information about the secure use of online and mobile banking services?	1- Strongly disagree	2.2
		2- Disagree	9.1
		3- Undecided	2.3
		4- Agree	41.8
		5- Strongly agree	44.6
	Do you use online and mobile banking services securely?	1- Strongly disagree	2.2
		2- Disagree	8.8
		3- Undecided	1.1
		4- Agree	45.8
		5- Strongly agree	40
	Do you think generally it's secure to use online and mobile banking services?	1- Strongly disagree	2.4
		2- Disagree	8.7
		3- Undecided	1.7
		4- Agree	48.9
		5- Strongly agree	36.8
Trust in Banks	Do you trust in online and mobile banking services of your bank?	1- Strongly disagree	2.7
		2- Disagree	6.6
		3- Undecided	1.6
		4- Agree	46.7
		5- Strongly agree	42.4
	Do you think your bank is trustworthy?	1- Strongly disagree	2.4
		2- Disagree	6.9

		3- Undecided 4- Agree 5- Strongly agree	1.8 42.3 46.6
Ease of use of online and mobile banking	Do you think it is easy to use online and mobile banking?	1- Strongly disagree 2- Disagree 3- Undecided 4- Agree 5- Strongly agree	2.0 7.7 1.1 45.0 44.2
	Do you find it's easy to be skillful at using online and mobile banking?	1- Strongly disagree 2- Disagree 3- Undecided 4- Agree 5- Strongly agree	2.9 7.5 1.4 44.3 43.9
	Is your interaction clear and understandable?	1- Strongly disagree 2- Disagree 3- Undecided 4- Agree 5- Strongly agree	3.1 7.8 1.9 45.2 42.0
Usefulness of using mobile banking	Is the use of online and mobile banking for your banking services increase your productivity?	1- Strongly disagree 2- Disagree 3- Undecided 4- Agree 5- Strongly agree	2.7 8.3 1.3 46.1 41.6
	Is the online and mobile banking enhancing your effectiveness of using banking services?	1- Strongly disagree 2- Disagree 3- Undecided 4- Agree 5- Strongly agree	2.8 8.4 2.3 41.5 45.0
	Overall, is the online and mobile banking a suitable solution for covering your needs of banking services?	1- Strongly disagree 2- Disagree 3- Undecided 4- Agree 5- Strongly agree	2.5 7.1 1.7 45.6 43.1

V. VALIDATION AND RELIABILITY OF RESEARCH MODEL

In this research study, the three criteria of the measurement model were implemented. These criteria are reliability analysis, convergent validity, and discriminant validity. Before testing the hypothesis and the model, the reliability and validity of the survey were tested. Table 3 shows the reliability of constructs containing the values of Cronbach's Alpha (α) that measure the internal consistency for five constructs. The values of Cronbach's Alfa are acceptable, and their range are from 0.807 to 0.918. Thus, all variable items are reliable and valid with a Cronbach Alpha value (CA) ≥ 0.70 [12] [13]. [14]

Table 4 shows the composite reliability (CR) and the average variance extracted (AVE) for the five constructs. For all constructs of the measurement model, the composite reliability values are higher than 0.8 and the AVE of the constructs are higher than 0.5. The composite reliabilities were above recommended value of 0.8 and the variance extracted measures were above recommended level of 0.5 for all constructs. These results shows overall validity of the used constructs. The estimated coefficients of the relationships between constructs were also examined to validate the hypotheses from our research model.

Table 3: Reliability of constructs

Construct	(no. of items)	Cronbach's Alpha
Attitude toward using	2	0.807
Perceived security	3	0.906
Trust	2	0.918
Perceived Ease of use	3	0.859
Usefulness	2	0.916

Table 4: Convergent Validity Statistics

Construct	CR	AVE
Recommended value	> 0.8	> 0.5
Attitude toward using	0.864	0.712
Perceived security	0.937	0.780
Trust	0.901	0.861
Perceived Ease of use	0.879	0.797
Usefulness	0.826	0.767
Coronavirus effect.	0.831	0.734

Table 5 shows the discriminant validity which determined whether the constructs in the model were correlated to each other. For assessing discriminant validity, it compares the square roots of each AVE which was calculated for each construct and its value needs to be higher than the off-diagonal correlation elements. The bold diagonals as shown in table 5 represents the square roots of the AVEs of the individual constructs with high value and the off-diagonal values represent the correlations between the constructs.

Table 5. Discriminant validity

Construct	1	2	3	4	5	6
1. Attitude toward using	0.844					
2. Perceived safety	0.621	0.883				
3. Trust	0.637	0.613	0.928			
4. Perceived ease of use	0.227	0.354	0.321	0.893		
5. Usefulness	0.467	0.316	0.367	0.344	0.876	
6. Perception of Covid effect	0.387	0.356	0.422	0.311	0.344	0.857

VI. RESULTS AND DISCUSSION

Regression analysis **considered as** a statistical process to test the hypotheses and estimate the relationships between dependent variables and one or more independent variable [10]. It is very important to Determine the relationships among the variables, β because it compares the contribution of each independent variable to describe the dependent variable [15].

This research study quantified how five constructs were affected by the coronavirus impact. So, the perception of corona virus effect had a significant influence on all constructs. Table 6 illustrates that all proposed hypotheses are supported. The result for H1 showed that $\beta = 0.173$ and $p\text{-value} < 0.001$. In the hypothesis H2 the result showed that $\beta = 0.181$ and $p\text{-value} < 0.001$. For H3, the result demonstrated that

$\beta = 0.219$ and $p\text{-value} < 0.001$. In the hypnosis H, the result showed that $\beta = 0.163$ and $p\text{-value} < 0.01$. Finally, the H5 showed that $\beta = 0.097$ and $p\text{-value} < 0.01$. Thus, all hypothesis, supported as in table 6 meaning that consumer's attitude toward using online and mobile banking increased as a positive relationship of coronavirus effect. While the attitude of consumers towards online and mobile banking services are positive, this means that if the trust of the online and mobile banking services is high then the consumers' perception about the need to develop the bank communication concerning online transactions risk exposure is negative. Therefore, the consumer become more aware of the impact of the coronavirus pandemic on their own lifestyle, the behavior of online and mobile banking services also reflects this influence.

Table 6. Hypothesis Testing

Variable	Coefficient	β	Significance	Support
H1 Attitude toward using	0.231	0.173	0.000	Yes
H2 Perceived security	0.151	0.181	0.000	Yes
H3 Trust	0.264	0.219	0.001	Yes
H4 Perceived ease of use	0.117	0.163	0.001	Yes
H5 Usefulness	0.084	0.097	0.002	Yes

VII. CONCLUSION

The research study investigated impact of coronavirus and it changed the attitudes of consumers toward increased use of online and mobile banking services. The survey to examine the impact of coronavirus pandemic on online and mobile banking in Egypt included 1343 Egyptian customers in banking and financial sector. The developed mechanism for analysis the data was baes on the technology acceptance modelling (TAM) approach with factors of perceived trust, security, and attitude towards using online and mobile banking. The results show that the technology factors attitude toward using, trust, ease of use, perceived usefulness and perceived security had high impact of use online and mobile banking in Egypt during coronavirus pandemic. For the future work, the research should examine the impact of using online and mobile banking services on the consumer behavior of other products and applying other research models.

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APPENDIX

Construct 1: Perception of The impact of Covid19

- Do you know the impact of Covid 19 in your lifestyle?
- Is there an impact of Covid 19 in using mobile banking services?

Construct 2: The use of online and Mobile banking

- Is it a good idea to use online and mobile banking services?
- Do you use online and mobile banking services more frequently than classic banking services during covid19?

Construct 3: Usefulness of using internet and mobile banking

- Is the use of online and mobile banking for your banking services increase your productivity?
- Is the online and mobile banking enhancing your effectiveness of using banking services?
- Overall, is the online and mobile banking a suitable solution for covering your needs of banking services?

Construct 4: Ease of use

- Do you think it is easy to use online and mobile banking?
- Do you find it's easy to be skillful at using online and mobile banking?
- Is your interaction clear and understandable?

Construct 5: Security

- Do you have enough information about the secure use of online and mobile banking services?
- Do you use online and mobile banking services securely?
- Do you think generally it's secure to use online and mobile banking services?

Construct 6: Trust

- Do you trust in online and mobile banking services of your bank?
- Do you think your bank is trustworthy?