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Online Banking Prospects in Morocco: An Extension of Technology Acceptance Model

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Abstract

The main purpose of this paper is to study the future prospects of online banking in Morocco, based on the technology acceptance model, by examining the intention of the Moroccan customers to adopt online banking and the factors that influence it. The questionnaire used in this study was distributed to 300 Moroccan banks' customers, and the data gathered were then analysed using structural equation modelling. The results indicate that perceived ease of use has a significant positive influence on the perceived usefulness of online banking, and both the variables have a significant positive influence on the attitude towards online banking. The latter further has a significant positive influence on the intention to adopt online banking services in Morocco. Furthermore, the invariance analysis showed that the influence is different for male and female customers. It is noteworthy that this is the first study to be conducted on online banking services in Morocco.

Keywords: Morocco, Online banking, TAM, SEM.

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INTRODUCTION

Online banking is becoming increasingly popular on a global scale. This practice can simply be defined as the delivery of banking services through the internet (Chi *et al.*, 2007). In fact, online banking has several advantages, for the bank itself, for the individual customers as well as for the institutional clients.

With regards to the banks, online banking contributes in enhancing the image of the bank in the market, as one that is introducing new technologies to the market. Furthermore, it also helps the industry to increase its market penetration, since online banking services are accessible worldwide. In addition, the use of online banking gives an opportunity for the bank to advertise the new financial products, to the increasing number of users.

Regarding the individual as well as the institutional customers, online banking increases their convenience and time saving, given that they can make their transactions without the need of physical interaction with the bank. Moreover, it allows them to reduce their costs to access and use banking services. Additionally, it provides them with a better administration of funds. This is because the transactions' history is usually registered on digital support and can be analysed any time the customers wishes to.

For several years, commercial banks in Morocco have tried to introduce online banking services to improve their operations and to reduce costs. Despite all their efforts aimed at developing better and easier online banking systems, these services remained largely unnoticed by the customers, and were seriously underused in spite of their availability.

Following the introduction of online banking, many studies have been done to examine the intention of the banks' customers in different countries to use it. Most of these studies have used either theory of reasoned action, theory of planned behaviour, decomposed theory of planned behaviour, or technology acceptance model (TAM thereafter). Given the current efforts to introduce online banking services in a wider scope, there is a need to examine the factors that may lead the Moroccan customers to opt for these products. Hence, the current study aims at filling this gap in the literature.

The remaining part of this paper is organised as follows: Section two is a brief overview on the history of the Moroccan banking sector. Section 3 covers the literature review focusing on TAM as well as the other technology and new products' adoption models. Section 4 shed light on the methodology employed in the study. And section 5 presents the findings of the study, by emphasising on the reliability of the model, the hypotheses' testing results as well as the invariance analysis. The last part will contain discussions and conclusions based on the findings.

HISTORY OF THE MOROCCAN BANKING SECTOR

Morocco is located in North Africa, on the southern shores of the Mediterranean Sea, separated from Spain by the Straits of Gibraltar. The indigenous Berbers, who are Muslims but not Arabs, declared their own country in 788. The region was conquered by the Arabs during the seventh century.

The European influence arrived during the sixteenth century (L.P. Dana and T.E. Dana, 1999).

The first banks were established in Morocco by the end of the nineteenth century. These banks were the Berlinz Orient Bank, the Bank of West Africa and the Comptoir National d'Escompte de Paris, German, English and French respectively. Few years later, more specifically in 1906, the Moroccan central bank was recognized by the green island treaty.

Tangier, which is one of the main Moroccan cities, was considered as the centre of all the banking businesses and operations from 1902 to 1912, this was also because it contained headquarters of most of the existing banks at the time. These banks have established branches in many other cities as well. It is worth mentioning that 1912 registered a large inflow of the French banks in the Moroccan market. At the end of 1912, the German banks were eliminated from Morocco, while the Bank of West Africa retreated to Tangier, and the Spanish banks were located in the Northern region and the French banks in the Southern part.

During the pre-adjustment period (before 1983), the allocation of financial resources were highly distorted by the government interventions. This allocation was largely driven by non-market mechanisms such as ceiling of refinancing by the central bank, credit rationing, mandatory holding of government securities by banks, and administratively set interest rates. These constraints limited the scope for competition and innovative practices among banks and lead to an excessive risk-averse banking sector.

The weight of mandatory holding (35 percent of banking sector assets) limited the ability of banks to manage their resources, and prevented them from allocating sufficient resources to acquiring and processing information on the private sector. During the pre-adjustment era, the primary task of the banking sector was to provide cheap finance to cover governments' deficit, and priority sectors' needs through mandatory holding of government securities, and bonds issued by the development or specialized banks.

In this context, the Moroccan authority has adopted a monetary policy based on the direct allocation of credit and refinancing from the central bank. The interest rates were administered, generally negative in real terms in the beginning of the 1980. On the other hand, the management of the credit excessive demand was done by credit rationing policy. At the meantime, the exchange control policy has helped maintain the inflation rate at an acceptable level.

By mid-1983, Morocco adopted a comprehensive structural adjustment program. In addition to the financial sector reform, different reforms took place during the adjustment period such as trade liberalization, exchange control liberalization, tax reform, and public enterprises reform and privatization. The Moroccan banking sector experienced substantial steps towards market oriented system from mid eighties and particularly in the nineties. Interest rate subsidies to priority sectors were reduced or eliminated. The monetary authorities started to manage liquidity through a more active use of reserve requirements and a more market-based allocation of refinancing. The share of refinancing of banks through the central bank intervention on the money market grew from 2.6 percent in 1985 to 27.4 percent in 1994.

In Morocco, as a country with 99% Muslims, some efforts have also been made recently by a number of Moroccan Banks such as Banque Marocaine du Commerce Extérieur

(BMCE) and Attijari Wafa Bank (AWB), in order to introduce some Islamic banking products into the system, or what is commonly called an "Islamic window" such as *Ijarah*, *Musharakah* and *Murabahah*. Nevertheless, only AWB was able to effectively offer some of these services.

By referring to the international criteria, the Moroccan banking system is relatively developed and well regulated. The recent consolidation operations have amounted to a strong concentration of the banking system. Currently, the Moroccan banks offer a wide and variant line of banking services even though it is not so sophisticated. The electronic banking services are still developing and various products are offered to individual as well as institutional customers. However, certain regulatory restrictions are imposed on the local banks especially regarding foreign exchange products, cash management, capital markets as well as investment financing.

LITERATURE REVIEW

Traditional branch-based retail banking remains the most widespread method for conducting banking transactions in many countries. However, Internet technology is rapidly changing the way personal financial services are being designed and delivered (Y.S. Wang, Y.M. Wang, Lin and Tang, 2003:1). According to Stefan (2000) as cited in Gurau (2002), by using internet, people can access their bank accounts and conduct transactions 24 hours a day, seven days a week, with reduced costs and increased conveniences.

Currently, many studies have emphasized the use and adoption of online banking, in different contexts and by using different approaches. T. Pikkarainen, K. Pikkarainen, Karjalupto and Pahnla (2004) have studied the acceptance of online banking in Finland, using a modified version of TAM. The model was comprised of six independent variables namely, perceived usefulness, perceived ease of use, perceived enjoyment, information on online banking, security and privacy as well as the quality of internet connection, and the dependent variable being the use of online banking. The results show that perceived usefulness as well as information on online banking have a significant positive influence on the use of online banking services, while the remaining variable were found to have an insignificant influence on the dependent variable.

Similarly, Chong, Ooi, Lin and Tan (2010) have explored the adoption online banking in Vietnam. The authors used four independent variables, namely, perceived ease of use, perceived usefulness, government support and trust. Their findings suggested that there is a positive significant influence of perceived usefulness, trust and government support on the intention to use online banking services in Vietnam.

In a different context, Gerrard and Cunningham (2003) have examined the diffusion of online banking among Singaporean customers. The authors have applied Roger's model of adoption and diffusion of innovations. The model contains six variables, namely, relative advantage, compatibility, complexity, trialability, observability and risk. The results indicate that compatibility, complexity and relative advantage have significant influence on the use of online banking in Singapore.

In China, Zhao, Lewis, Lloyd and Ward (2010) have studied the adoption of online banking focusing on the trust dimension. The variables used in this study includes trust in the bank, perceived risk of online banking services as well as the competence in terms of online banking services. The results showed that perceived risk has a significant negative influence on the adoption of online banking. Moreover, the results provide evidence of the important role of trust in the adoption of online banking services. Furthermore, the results indicated that trust in the bank has a significant positive influence on the trust in its competence in operating online banking services.

Y.S. Wang, Y.M. Wang, Lin and Tang (2003) conducted a similar study in Taiwan, using TAM by adding one more variable i.e. perceived credibility. The results showed that perceived ease of use has a significant positive influence on both perceived usefulness and perceived credibility. Moreover, the three said independent variables were found to have a significant positive influence on the intention to use online banking services in Taiwan.

In the same context, Shih and Fang (2004) have studied online banking in Taiwan using decomposed theory of planned behaviour. The findings suggest that the attitude is influenced by relative advantage as well as complexity.

Furthermore, subjective norm was found to be significantly affected by normative influences. Moreover, perceived behavioural control was also found to be significantly depending on the efficacy. Finally, the behavioural intention was found to be positively influenced by the attitude towards online banking as well as the perceived behavioural control.

In Malaysia, Nor, Sutanonpaiboon and Mastor (2010) have studied the adoption of online banking, using TAM and considering the cultural traits for both Malay and Chinese. The results suggest that perceived ease of use, perceived usefulness and trust all have a significant effect on the intention to use online banking for both ethnic groups.

In another context, Gurau (2002) examined the prospects and challenges of adopting online banking in Romania, and he has found that the adoption of online banking depends on the quality and security of internet network, the level of internet knowledge of the population, the government support, as well as the internet strategy of the bank and the reliability of online banking services.

Among the above models, TAM has been chosen mainly because its basis represents an important theoretical contribution towards the understanding of online banking acceptance and behaviour (Malhotra and Galletta, 1999). Accordingly, the research hypotheses are posited regarding the effect of perceived ease of use and perceived usefulness on the attitude towards online banking services in Morocco, and also the influence of the attitude on the intention to adopt online banking services. The hypotheses are as follows:

H1: Perceived ease of use will have a positive influence on the perceived usefulness of online banking services.

H2: Perceived ease of use will have a positive influence on the attitude towards online

banking services.

H3: Perceived usefulness will have a positive influence on the attitude towards online banking services.

H4: Perceived usefulness will have a positive influence on the Intention to adopt online banking services in Morocco.

H5: The attitude towards online banking services will have a positive influence on the Intention to adopt them.

METHODOLOGY

The target population for this study covers Moroccan bank customers. The survey questionnaire was distributed to the customers of the branches located in the cities of Casablanca and Rabat, covering Banque Marocaine du Commerce Extérieur (BMCE), Attijari wafabank (AWB), Banque Marocaine du Commerce et d'Industrie (BMCI), as well as Banque Populaire (BP).

What justifies the choice of Rabat and Casablanca is the fact that these two are the administrative and commercial capital of the country respectively. In addition, the Moroccan commercial law obliges the Moroccan banks to establish the headquarters as well as the major branches in Casablanca.

Furthermore, the characteristics of the cities made the Moroccan citizens to come from their native cities, in search of jobs in these two respective cities. A total of 300 questionnaires were randomly distributed, out of which 272 questionnaires were returned and usable, hence, making a response rate of over 90%.

Since the current study uses the TAM to test the factors that determine the intention of the banking customers to adopt online banking services in Morocco, the questionnaire used in this study was derived from the original instrument designed by Davis (1989). The instrument was subsequently adjusted to suit the adoption of online banking services in Morocco.

The questionnaire was made of two main parts, the first part was meant to measure the four latent constructs of TAM, using a five points likert scale ranging from 1 as strongly disagree to 5 as strongly agree, while the second part was meant to explore the demographic information related to the respondents. It is worth mentioning that the questionnaire was initially made in English and was subsequently translated into French language, by consulting the language as well as the bank marketing experts.

The data gathered were subsequently analysed using exploratory factor analysis as a preliminary step to structural equation modelling (SEM thereafter). Furthermore, the analysis was done through two softwares, namely, AMOS 18 and SPSS 18.

The demographic information of the respondents indicates that out of the 272 respondents, around 63 per cent were male, while 37 percent were female. In terms of

age grouping, around 38 percent of the respondents are between 41 to 50 years old, 30 per cent are between 31 to 40 years old, while 22 per cent are between 20 to 30 years. The remaining 10 per cent are above 50 years old. Overall, 59 per cent are single while the remaining 41 per cent are married.

Regarding the level of education, 53 percent are holding a bachelors' degree, 29 per cent are holding masters degree, 12 per cent are holding a baccalaureate and the remaining 6 percent are holding a PhD degree. For the type of employment, 34 are self employed, 29 per cent of the respondents are working in the private sector, 19 per cent are students and the remaining 18 per cent are holding positions in the public sector.

On the other hand, by looking at the duration of customer-ship with the banks, we find that 56 per cent percent of the respondents have been customers with the bank for more than five years. Another 28 per cent have been customers with the bank for three to less than five years, while the remaining 16 percent of the customers have been with the bank for one to less than three years.

FINDINGS

Validity measures

The baseline model summary shown in Table 1 indicates a Chi square value of 339.72, a degree of freedom of 84, a normed Chi square of 4.044, an RMSEA value of 0.106 and a CFI value of 0.903. Based on the thresholds mentioned by Browne and Cudeck (1993), Hu and Bentler (1999) as well as Kim and Forsythe (2010), this is an acceptable model fit.

Table 1: Measurement model fit summary

Model	NPAR	CMIN	DF	P	CMIN/DF	RMSEA	CFI
Default model	36	339.720	84	.000	4.044	.106	.903
Saturated model	120	.000	0				1.000
Indp model	15	2746.457	105	.000	26.157	.305	.000

Nunally (1978) argues that the purpose of validation is to give researchers, their peers, and society as a whole, the confidence that the method they have used is useful and robust in the quest of scientific truth. According to Hair, Black, Babin and Anderson (2010), construct validity is one of the main assessment objectives under SEM. Construct validity is concerned whether the indicators chosen by the researcher are together an adequate combination to measure a specific construct.

It is comprised of four components, which will be discussed and assessed accordingly, depending on the corresponding findings.

The first one to be considered is the convergent validity. In simple terms, it means that the items that are thought to measure a given construct basically converge. In other words, these items should show high relative significant correlations with each other, especially in contrast with the items relevant to other constructs.

Based on Hair *et al.* (2010), the convergent validity test is done through the assessment of the factor loadings and average variance explained that should be greater or equal to 0.5, as well as the reliability measure that should be at least 0.6. Accordingly, the results show that all the factor loadings are greater than 0.5. Furthermore, the average variance explained shown in Table 2 also indicates values of at least 0.523. Finally, the construct reliability is greater than 0.6 for all the constructs as suggested by Hair *et al.* (2010). Hence, all the convergent validity measures are verified, confirming the convergent validity of the model.

Table 2: Validity and reliability

Constructs	Construct reliability	Average variance extracted
Perceived ease of use	0.788	0.536
Perceived usefulness	0.894	0.523
Attitude	0.666	0.653
Behavioural intention	0.930	0.721

Secondly, the discriminant validity should be tested. This means that every construct should be different from the remaining constructs. To examine the discriminant validity, it is recommended to fix the correlation between two of the model constructs to 1, and then proceed to the Chi square comparison between the two models i.e. the baseline model and the constrained model (Byrne, 2010; Hair *et al.*, 2010).

Table 3 below shows the Chi square values as well as the degrees of freedom for both models. The change in the Chi square value is 163.548, while the change in the degrees of freedom is 1. By comparing these values to the critical value extracted from the Chi square table, corresponding to a degree of freedom of 1 and a confidence margin of 0.05, which is a value of 3.84, we can conclude that the Chi square difference test is significant. Thus, the model does have discriminant validity.

Table 3: Discriminant validity measure

Elements	Chi square	DF
Baseline model	339.72	84
Two-construct model	503.268	85
Change	163.548	1

In addition to the convergent and discriminant validity, the face validity and nomological validity have also been assured by referring to the specialists and professionals in the field of bank marketing, locally as well as internationally.

Structural model

The structural model in Figure 1 as well as the model summary in Table 4 show a Chi square value of 368.977, a normed Chi square of 4.341, an RMSEA of 0.111 and a CFI value of 0.892 which is good and acceptable model fit based on Browne and Cudeck (1993), Hu and Bentler (1999) as well as Kim and Forsythe (2010), that consider a CFI value of 0.8 and higher as acceptable.

Table 4: Structural model fit summary

Model	NPAR	CMIN	DF	P	CMIN/DF	RMSEA	CFI
Default model	35	368.977	85	.000	4.341	.111	.892
Saturated model	120	.000	0				1.000
Indp model	15	2746.457	105	.000	26.157	.305	.000

Table 5 and 6 below indicate the direct and indirect effects respectively. The results indicate that the perceived ease of use has a significant positive influence on the perceived usefulness of online banking. This is shown by the regression coefficient of 0.773 and it supports hypothesis 1 initially claiming that the perceived ease of use of the online banking services will have a positive influence on its perceived usefulness. This is compatible with the findings of Y.S. Wang *et al.* (2003).

Moreover, the results also suggest that the perceived ease of use has a significant positive effect on the attitude towards online banking. The regression coefficient of 0.607 supports hypothesis 2 stating that the perceived ease of use of online banking services will have a positive influence on the attitude towards these services. This is similar to the findings of Nor *et al.* (2010) and Y.S. Wang *et al.* (2003), but contradicts with those of T. Pikkarainen *et al.* (2004). This is mainly because the latter studied a sample of banking professionals that generally receive the necessary trainings whenever a new product is introduced.

Furthermore, the results also suggest that perceived usefulness has a significant positive influence on the attitude towards online banking services. In fact, the significant coefficient of 0.329 supports hypothesis 3 claiming that the perceived usefulness of online banking will have a positive influence on the attitude towards online banking services. This is similar to the findings of T. Pikkarainen *et al.* (2003) and Chong *et al.* (2010).

In addition, the attitude towards online banking services was found to have a significant positive influence on the intention to adopt online banking services in Morocco. This is shown by the high regression coefficient of 0.779, thus supporting hypothesis 5. The only hypothesis that was not supported is hypothesis 4, because the findings suggest that perceived usefulness has no direct significant effect on the behavioural intention in this case, which contradicts with the findings of Y.S. Wang *et al.* (2003). This indicates that the usefulness of online banking services alone cannot determine their adoption by the customers, unless associated with the other attributes that can subsequently influence the customers' attitude.

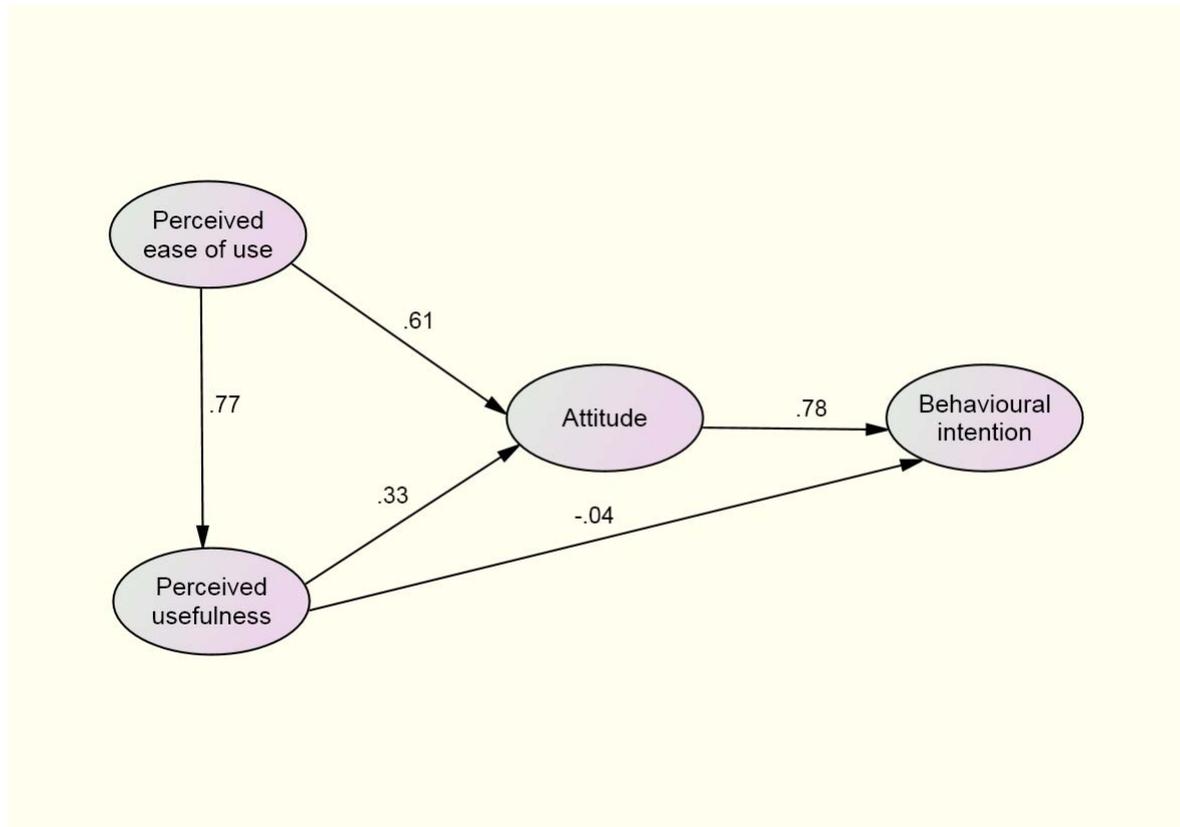


Figure 1: Structural model

On the other hand, the results also provide evidence that perceived ease of use has a significant indirect effect on both the attitude as well as the intention to adopt online banking services in Morocco. Similarly, the findings provide evidence that the perceived usefulness on online banking services has a significant indirect effect on intention to adopt them.

Table 5: Direct effects

	Perceived_ease of use	Perceived_usefulness	Attitude
Perceived_usefulness	.773	.000	.000
Attitude	.607	.329	.000
Behavioural_intention	.000	-.039	.779

Table 6: Indirect effects

	Perceived_ease of use	Perceived_usefulness	Attitude
Perceived_usefulness	.000	.000	.000
Attitude	.254	.000	.000
Behavioural_intention	.641	.256	.000

Invariance analysis

After the initial assessment for the proposed model, we conducted SEM for male and female groups to test proposed hypotheses by estimating the structural coefficients for male and female groups separately.

The results show that the model fits similarly for male and female alike. Notwithstanding, the findings suggest that the influence of the attitude on the intention to adopt online banking services is much higher for the male as compared to the female customers. Similarly, the influence on the perceived ease of use on the attitude towards online banking services is higher for male customers compared to the females.

In contrast, the influence of the perceived ease of use on the attitude towards online banking services is greater in the case of male customers as compared to the female customers. The same thing applies to the influence of the perceived ease of use on the perceived usefulness.

In addition, the findings also suggest that perceived usefulness does not have a direct influence on the behavioural intention for male customers. However, it was found to have a significant positive influence on the intention to adopt online banking services for the female customers.

The above results indicate that the Moroccan banks should adopt a diversified and personalised marketing policy. This should integrate different approaches to gain confidence and acceptance of both female as well as male customers. The said policy should be able to attract and satisfy the needs and requirements for both genders.

CONCLUSION

The study initially aimed at examining the prospects of the online banking services in Morocco. Specifically, the study attempted to investigate the factors that may lead the Moroccan banking customers to adopt online banking, by using TAM.

The results show that the Moroccan banking customers are willing to adopt online banking. However, this will depend on their attitude about them, and this further depends on the perceived ease of use as well as the usefulness of the online banking services. Meanwhile, perceived ease of use was found to be a major determinant of the perceived usefulness of online banking services in Morocco. As such, the Moroccan banks have interest in highlighting this quality of the online services, and also keeping the customers informed about the measures put forward to further facilitate the use of the online banking services.

Furthermore, the fact that the perception of male and female customers were found to be different, is a sign for the Moroccan banks, that should be more precise in establishing a comprehensive marketing policy, taking into account not only the importance of the ease of use perception, but also the different perception from male and female respondents.

The findings of the study have important implications, for decision makers, policy makers as well as to the body of knowledge. In fact, this is the first study that examined the

prospects of online banking in Morocco, by using TAM. Moreover, the findings will give hindsight to the policy makers and decision makers that attempt to provide and enhance online banking services in Morocco.

The researchers that are aiming to undertake studies in this area are advised to take into account some additional variables, such as trust, government contribution and credibility, in order to provide more comprehensive results. Additionally, the future studies should be directed to other countries that still did not introduce online banking services or those for which it is still underused.

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