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## Factors behind Resisting Mobile-Banking Adoption: The Case of Tunisian Consumers

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### Abstract

The aim of this study is to examine Tunisian consumers' resistance to adopting mobile-banking. This paper empirically studies the impact of barriers to M-banking adoption in an emerging country. To this end, a conceptual TAM-based model integrating functional and psychological barriers was developed. The results show first that perceived usefulness and perceived ease of use positively determine intention to adopt, second that value and tradition barriers have a significant negative effect on perceived usefulness of M-banking and third the use barrier has a negative impact on perceived ease of use of M-banking services. They also indicate that risk and image barriers have no influence respectively on perceived usefulness and ease of use. This study provides a better understanding of the phenomenon of resistance to the adoption of mobile banking and recommends bank executives ways they can use to affect consumers attitude in view of reducing their resistance to the use of mobile banking services. It also has implications in terms of strategies to be implemented to attract new customers and overcome resistance to mobile banking.

**Keywords:** Intention to adopt; perceived usefulness; perceived ease of use; barriers to adoption; M-banking.

### 1. Introduction

Over the past two decades, advances in information technology have revolutionized banking.

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They have provided new types of added value for customers and helped to develop among other things electronic banking services based on the Internet and mobile telephony [1,2]. Mobile devices have become means to access internet and all kinds of information at any time and any place, because of the coverage of telecommunication infrastructure [3].

In Tunisia, there are many factors behind the success of internet and mobile technology, such as the high penetration rate of mobile phones and Internet and the availability of alternative payment methods. However, despite its many advantages, the use of mobile banking in Tunisia still faces some obstacles. It seems that some inhibitors slow the use of mobile banking channels [2]. Moreover, the importance of factors which influence the adoption of ATMs, online banking and M-banking significantly differ across channels [4].

The choice to investigate resistance to adopt M-banking is justified by lack of research on this topic compared to the great interest placed on the phenomenon of adoption. This is true for both developed and developing countries [5]. There is therefore a need to understand the non-adoption phenomenon of M-banking and identify barriers to its adoption in the Tunisian context [6].

The aim of this study is to present a model, based on the technology acceptance model (TAM), to analyze the impact of resistance to adopt mobile banking. The study reports the results of a survey of 150 Tunisian bank customers, non-users of mobile banking services.

## **2. M-Banking in Tunisia**

In Tunisia, most banks have introduced electronic banking services to enable their customers to conduct remote financial transactions. However, online banking has not taken off and the number of people using M-banking is low, though there is a rising trend in the use of mobiles [2]. However, worldwide, 200 000 bankers believe there is a considerable growth potential of M-banking [7]. The success of M-Banking in countries like South Africa, Kenya and Botswana [8] can be a good indication of its success in Tunisia.

## **3. The framework**

In what follows, we present the technology acceptance model and the barriers facing the adoption of an innovation which is the focus of our conceptual model.

TAM was developed by Davis in 1985. This is the model most widely used by researchers and practitioners because of its parsimony, simplicity, ease, specificity, originality and richness of its empirical validation [9,10]. This particular model was used to explore the factors that affect the use of new technologies [11]. TAM posits that intention to adopt (IA) is determined by perceived usefulness (PU) and perceived ease of use (PEU) [12,13].

PU is defined as the degree to which a person believes that the use of a technology improves their performance, while PEU refers to the degree to which an individual believes that the use of a technology does not imply much effort, [12]. While intention to adopt (IA) is considered to be a mental pattern that an individual follows that starts when they first receive information on innovation until its adoption, [14]. TAM assumes the presence of a

positive relationship between PEU and PU [15,11,16]. Therefore, we formulate the following hypothesis H1:

**H1:** PEU positively influences the PU. TAM assumes also a positive relationship between PU and IA [12,17,18,19]. We support this relationship and put forward H2 below.

**H2:** PU acts positively on IA.

As for PEU, it is hypothesized to positively influence IA [11,16,17]. Then, we formulate the following hypothesis H3:

**H3:** PEU has a positive impact on IA.

### ***3.1. Barriers to adoption of innovation***

Reference [20] indicates that innovation may generate a high degree of change in a consumer's routines and can therefore disrupt their habits. These authors also found that innovation may conflict with the structure of a consumer's beliefs. These two phenomena may constitute barriers to adoption and can be grouped into functional and psychological barriers.

#### ***3.1.1. Functional barriers***

Reference [20] assumes that functional barriers appear once consumers perceive significant changes in the adoption of an innovation. These barriers include use (UB), value (VB) and risk (RB) barriers. VB refers to the monetary value of innovation. It assumes that if innovation does not offer a strong price-performance ratio compared to its substitute, there is no motivation to adopt it. Indeed, the higher the cost of innovation is, the higher perceived risk is [20]. Reference [21], examining the Finnish context, found that VB is the most influential barrier to the adoption of M-banking. Therefore, we propose the following hypothesis:

**H4:** VB negatively influences PU.

As for RB, previous research indicates that risk is one of the main factors behind consumers' resistance to adopt mobile banking [22,23,24,25,26,27]. Therefore, we support the following hypothesis:

**H5:** RB negatively influences PU.

As for UB, it refers to the gap between innovation and practices, habits and past experiences. Therefore, consumers need time to accept it [20]. For M-banking, consumers report as drawbacks the small size of the keyboard and the tiny displaying screen [28,29]. Reference [28] found that consumers do not adopt mobile banking because it is complex and difficult to use. Since PEU relates to the degree of complexity of technological innovation, it is accepted that UB has a negative effect on PEU [31, 30]. Hence, the following hypothesis,

**H6:** UB negatively influences PEU.

After describing the functional barriers, in what follows we present the psychological barriers.

### 3.1.2. Psychological barriers

Reference [20] assumes that psychological barriers result from incompatibility with consumers' previous beliefs and they include the tradition barrier (TB) and the image barrier (IB).

TB refers to changes that innovation may generate in a consumer's daily routines, who prefer to maintain their behavior while using the new products [20,32]. Reference [33] found that in the Tunisian context the main resistance factor behind the adoption of mobile financial services is TB. Hence, we hypothesize the following:

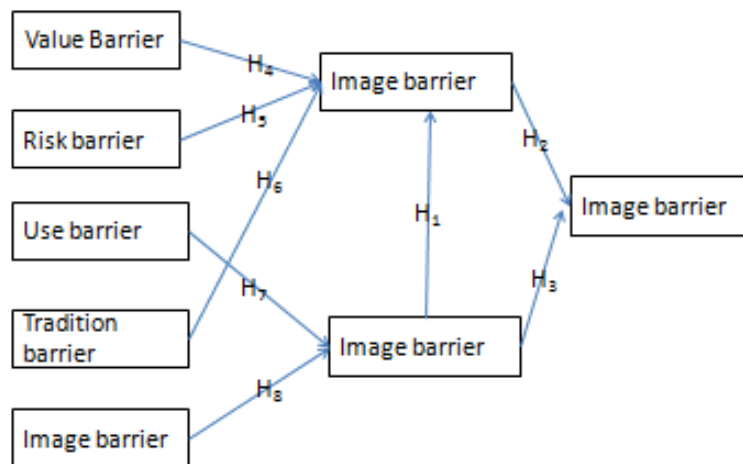
**H7:** TB negatively influences PU.

As for IB, it relates to the nature of innovation and product, brand and family. If consumers have a negative impression on the brand or product, they tend to reject innovation. Reference [21] found that in Finland a negative image leads to the non-adoption of mobile banking. Furthermore, Reference [31] found that customers who have a negative image of mobile banking services consider them to be difficult to use. Therefore, we retain the following hypothesis:

**H8:** IB negatively influences PEU.

## 4. The model

Bearing in mind the previous hypotheses, the structure of the relationships between the variables of the model explaining intention to adopt M-banking is shown in Figure 1 below:



**Figure1:** The model.

## 5. Methodology

The sample, data collection and analysis methodology will be presented successively in what follows.

### 5.1. The Sample

The study sample consists of 150 bank customers who do not use mobile banking.

### 5.2. Data collection

To collect the data, we administered a face-to-face questionnaire that integrates the measurement scales of the variables of our model presented in Table 1. Respondents were asked to indicate their level of agreement or disagreement with the proposed statements on a scale from 1 to 5 with 1 "strongly disagree" and 5 "strongly agree".

### 5.3. Data analysis methods

To process our data, we used simple and cross tabulation, exploratory factor analysis (EFA) and regression using SPSS software Version 21.

**Table 1:** Measurement scales

Codes	Items	Auteurs
	<b>Use Barrier</b>	
<b>BU1</b>	Mobile banking services are easy to use	[34]
<b>BU2</b>	Use of MBS is convenient	
<b>BU3</b>	MBS are quick to use	
<b>BU4</b>	Evolution of MBS is clear	
<b>BU5</b>	The possibility of change access code to MBS is convenient	
	<b>Value Barrier</b>	
<b>VB1</b>	Use of MBS is economical	[34]
<b>VB2</b>	Use of MBS allows me to monitor my financial situation.	[35]
<b>VB3</b>	MBS is not as convenient as other channels i use to monitor my finances.	
<b>VB4</b>	Mobile banking is useful to make banking transactions.	
	<b>Risk Barrier</b>	
<b>RB1</b>	I worry when I use MBS that my laptop battery is low or the internet connection is off.	[34]
<b>RB2</b>	I worry about making mistakes when using SBM.	[35]
<b>RB3</b>	I worry about losing my secret code and placed in the wrong hands.	
<b>RB4</b>	I am convinced that an MBS printable receipt is proof of payment.	
<b>RB5</b>	I am sure that the personal information on my mobile bank account cannot be accessed by any other person.	
<b>RB6</b>	It is easy that my money can be stolen using MBS.	

<b>RB7</b>	I do not feel completely safe if I provide personal information when using MBS.	
<b>RB8</b>	I do not feel completely safe if I send personal information through MBS.	
<b>RB9</b>	The MBS system is not secure.	
<b>RB10</b>	The MBS system can be hacked.	
<b>Tradition Barrier</b>		
<b>TB1</b>	Visits to the agency and discussions with sales staff is a source of pleasure and joy.	[36]
<b>TB2</b>	I find free-service alternatives nicer than a customized Customer Service.	
<b>TB3</b>	Banks are pressing customers to adopt M-banking.	
<b>TB4</b>	I prefer to manage my banking transactions through the means already in place instead of MBS.	
<b>TB5</b>	I'm so used to the banking transactions means already established, that I would find it difficult to replace them with MBS.	
<b>Image Barrier</b>		
<b>IB1</b>	The new technology is very complicated to be useful.	[20]
<b>IB2</b>	I feel that MBS is difficult to use.	[35]
<b>IB3</b>	I have a very positive image of MBS.	
<b>IB4</b>	SBM frustrates me.	
<b>Intention to Adopt</b>		
<b>IA1</b>	I intend to adopt MBS during this year.	[30]
<b>IA2</b>	I intend to adopt MBS in 2016 or 2017.	[37]
<b>IA3</b>	I intend to adopt after 2017 SBM.	
<b>IA4</b>	I do not intend to adopt MBS in the future.	
<b>Perceived Ease of Use</b>		
<b>PEU1</b>	It's easy to learn how to use MBS.	[10]
<b>PEU 2</b>	It would be easy to make MBS do what I want it to do.	[22]
<b>PEU 3</b>	I think using MBS does not need much effort.	
<b>PEU 4</b>	I think it is easy to use MBS to do my banking.	
<b>PEU 5</b>	Use of MBS is clear and understandable.	
<b>Perceived Usefulness</b>		
<b>PU1</b>	Use of MBS saves me time.	[22]
<b>PU2</b>	Use of MBS would improve my efficiency in managing my banking.	
<b>PU3</b>	SBM is helpful.	
<b>PU4</b>	It's easy to do my banking via my mobile phone.	
<b>PU5</b>	I think use of MBS should be advantageous.	

## 6. The results

In what follows, we report the sample's descriptive statistics, the results of EFA and the regression analysis used to test our research hypotheses.

**6.1. The descriptive statistics**

The descriptive statistics of our sample are presented in Table 2 below.

**Table 2:** Descriptive statistics of the sample

	<b>Effectifs</b>	<b>%</b>
<b>Gender</b>		
Male	62	41,3
Female	88	58,7
<b>Age</b>		
20 years and above and less than 30 years	54	36
30 years and above and less than 40 years.	66	44
40 years and above and less than 50 years.	11	7,3
50 years and above and less than 60 years.	14	9,3
60 years and above	5	3,3
<b>Monthly income</b>		
Less than 500D	17	11,3
500 D and above and less than 1000D	32	21,3
1000 D and above and less than 1500D	63	42
1500 D and above and less than 2000D	33	22
2000 D and above and less than 2500D	4	2,7
2500 D and above	1	0,7
<b>Profession</b>		
craftsman	31	20,7
liberal profession	33	22,0
senior executive	20	13,3
junior executive	39	26,0
Teacher	13	8,7
inactive	14	9,3
<b>Education</b>		
Primary not fulfilled	14	9,3
Primary fulfilled	13	8,7
Secondary not fulfilled	13	8,7
Secondary fulfilled	33	22,0
University not fulfilled	29	19,3
University fulfilled	48	32,0
<b>Total</b>	<b>150</b>	<b>100</b>

The sample consisted of 58.7% women and 41.3% men. Regarding age, we note that most of the respondents 80% are aged between 20 and 40 years. We also note that 42% of the respondents have monthly incomes

between 1000 and 1500D and 26% of them are junior executives. As for education, the sample consists of 51% with higher education levels.

**Table 3:** Descriptive statistics of responses

<b>Items</b>	<b>Mean</b>	<b>Standard Deviation</b>
<b>BU1</b>	2,920	1,120
<b>BU2</b>	2,773	1,100
<b>BU3</b>	2,960	1,214
<b>BU4</b>	2,980	1,217
<b>BU5</b>	3,006	1,217
<b>BV1</b>	2,946	1,122
<b>BV2</b>	2,853	1,113
<b>BV3</b>	2,960	1,214
<b>BV4</b>	3,033	1,217
<b>BR1</b>	3,793	1,131
<b>BR2</b>	3,546	1,120
<b>BR3</b>	3,000	1,086
<b>BR4</b>	3,460	1,078
<b>BR5</b>	3,593	1,036
<b>BR6</b>	2,920	1,120
<b>BR7.</b>	2,773	1,100
<b>BR8</b>	2,960	1,214
<b>BR9</b>	2,980	1,217
<b>BR10</b>	3,006	1,217
<b>BT1</b>	2,583	1,113
<b>BT2</b>	2,960	1,214
<b>BT3</b>	3,033	1,217
<b>BT4</b>	3,006	1,217
<b>BT5</b>	3,680	1,070
<b>BI1</b>	3,566	1,233
<b>BI2</b>	3,740	0,893
<b>BI3</b>	3,773	0,935
<b>BI4</b>	3,886	0,916

**6.2. The descriptive statistics of the responses**

The descriptive statistics of the responses are presented in Table 3. We note that image barrier is the main



obstacle to the adoption of mobile banking services among Tunisian consumers. It has the highest mean and the lowest standard deviation (mean: 3.886, SD = 0.916). The risk barrier comes second (mean: 3.793, SD = 1.131), then the tradition barrier (mean: 3.680, SD = 1.070), and the value barrier (mean: 3.033, SD = 1.217) and finally comes the use barrier (mean 3.006; SD = 1.217).

**6.3. Results of the EFA**

The results of EFA are shown in Table 4. Using a principal components analysis (PCA) with a varimax rotation, we eliminated items that have a loading coefficient lower than 0.5. We retained 41 items. Cronbach’s alphas range between 0.721 and 0.853 indicating an acceptable level of reliability. KMO coefficients vary between 0.656 and 0.850 and Bartlett’s test of sphericity ( $p < 0.005$ ) confirm that EFA is adequate.

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**Table 4:** Results of EFA

Items	BU	BV	BR	BT	BI	IA	FUP	UP
BU1	0,631							
BU2	0,796							
BU3	0,814							
BU4	0,871							
BU5	0,845							
BV1		0,706						
BV2		0,644						
BV3		0,770						
BV4		0,827						
BR1			0,319					
BR2			0,790					
BR3			0,852					
BR4			0,647					
BR5			0,613					
BR6			0,719					
BR7.			0,738					
BR8			0,743					
BR9			0,734					
BR10			0,612					
BT1				0,814				
BT2				0,871				

<b>BT3</b>				0,845				
<b>BT4</b>				0,631				
<b>BT5</b>				0,796				
<b>BI1</b>					0,680			
<b>BI2</b>					0,779			
<b>BI3</b>					0,913			
<b>BI4</b>					0,907			
<b>IA1</b>						0,721		
<b>IA2</b>						0,867		
<b>IA3</b>						0,856		
<b>IA4</b>						0,746		
<b>FUP1</b>							0,743	
<b>FUP2</b>							0,755	
<b>FUP3</b>							0,721	
<b>FUP4</b>							0,776	
<b>FUP5</b>							0,752	
<b>UP1</b>								0,868
<b>UP2</b>								0,574
<b>UP3</b>								0,696
<b>UP4</b>								0,788
<b>UP5</b>								0,882
<b>Alpha de Cronbach</b>	<b>0,853</b>	<b>0,721</b>	<b>0,847</b>	<b>0,853</b>	<b>0,841</b>	<b>0,809</b>	<b>0,804</b>	<b>0,825</b>
<b>KMO</b>	<b>0,709</b>	<b>0,734</b>	<b>0,850</b>	<b>0,709</b>	<b>0,656</b>	<b>0,760</b>	<b>0,835</b>	<b>0,688</b>
<b>Khi deux</b>	<b>598,69</b>	<b>116,7</b>	<b>482,2</b>	<b>598,6</b>	<b>497,7</b>	<b>209,1</b>	<b>206,0</b>	<b>534,670</b>
	<b>4</b>	<b>71</b>	<b>64</b>	<b>94</b>	<b>27</b>	<b>20</b>	<b>14</b>	
<b>Sig</b>	<b>0,000</b>	<b>0,000</b>	<b>0,000</b>	<b>0,000</b>	<b>0,000</b>	<b>0,000</b>	<b>0,000</b>	<b>0,000</b>

#### 6.4. The results of the regression analysis

To test hypothesis H<sub>1</sub>, we performed a simple linear regression. The results indicate that perceived ease of use positively affects perceived usefulness as shown in Table 2. We can conclude that H<sub>1</sub> is valid. To test hypotheses H<sub>2</sub>, H<sub>3</sub>, H<sub>4</sub>, H<sub>5</sub>, H<sub>6</sub>, H<sub>7</sub> and H<sub>8</sub>, we conducted multiple linear regressions. Intention to adopt is positively determined by perceived usefulness and perceived ease of use. It follows that hypotheses H<sub>2</sub> and H<sub>3</sub> are retained. Regarding perceived usefulness, it is found to be significantly and negatively affected by tradition and value barriers. However, the risk barrier seems not to exert a significant impact on perceived usefulness. Therefore, hypotheses H<sub>4</sub> and H<sub>6</sub> are retained while H<sub>5</sub> is rejected. Finally, perceived ease of use is negatively influenced by the use barrier. As for the image barrier, it has no significant effect on perceived ease of use. Thus, H<sub>7</sub> is retained while H<sub>8</sub> is rejected.

**Table 5:** Summary of hypotheses and results

Hypothesis	Bêta	T	Sig	Conclusions
<b>H<sub>1</sub>:</b> La FUP - l'UP	,281	3,558	.001	<b>H<sub>1</sub> vérifiée</b>
<b>H<sub>2</sub>:</b> L'UP - l'IA	,931	33,43	,000	<b>H<sub>2</sub> vérifiée</b>
<b>H<sub>3</sub>:</b> La FUP - l'IA	,050	1,983	,047	<b>H<sub>3</sub> vérifiée</b>
<b>H<sub>4</sub>:</b> La BV - l'UP	,111	2,621	,010	<b>H<sub>4</sub> vérifiée</b>
<b>H<sub>5</sub>:</b> La BR - l'UP	,013	,921	,359	<b>H<sub>5</sub> non vérifiée</b>
<b>H<sub>6</sub>:</b> La BU- la FUP	,586	1,994	,048	<b>H<sub>6</sub> vérifiée</b>
<b>H<sub>7</sub>:</b> La BT- l'UP	,883	20,74	,000	<b>H<sub>7</sub> vérifiée</b>
<b>H<sub>8</sub>:</b> La BI- la FUP	,322	1,098	,048	<b>H<sub>8</sub> non vérifiée</b>

## 7. Discussion

The results show that PEU positively influences PU, PU acts positively on IA and PEU also has a positive impact on IA. These results indicate the validity of our measurement model of IA ( $R^2 = 0.89$ ) and confirm those found by [18] in their study of the adoption of online banking in Tunisia.

As for PU, we found that it is negatively influenced by VB and TB, while UB has a negative effect on PEU. These results confirm those obtained by [31] in the context of mobile banking. Furthermore, we found that neither RB nor IB has a significant impact as determinants of PU and PEU. Our results are similar to those found by [31] in South Africa.

## 8. Managerial implications

The results may help to understand why Tunisian customers resist the adoption of M-banking. In addition, they are similar to those found by [16,18,31] who demonstrated that PU and PEU are negatively influenced by obstacles to the adoption of innovation.

Tunisian banks are invited to adopt marketing strategies that could reduce resistance to adopt mobile banking. They can use the results of this study and rely on the security of mobile banking while specifying the techniques used and their reliability. They can also highlight the benefits of M-banking during their advertising campaigns to improve the perceived image of mobile banking.

## 9. Limitations and future research

The main limitation of this research is the fact that we did not include the construct "attitude" in our model. Attitude is a crucial determinant of an intention to adopt.

In addition, previous research shows that customers differ in terms of socio-demographic variables such as age,

income and gender; however, this study did not examine these moderating factors. It would be interesting to expand this study by including the variable "attitude" as a determinant of the intention to adopt and integrating the moderating variables of age, income and gender.

## **10. Conclusion**

Mobile banking scores different resistance factors that can hinder its adoption by customers. We developed a model integrating the main factors of resistance to the adoption of mobile banking inspired by TAM. This study reports a survey of 150 Tunisian customers of banks, non-users of mobile banking. The results indicate that PEU and PU positively influence intention to adopt (IA) M-banking in Tunisia. PU has a positive effect on PEU. We found also that UB negatively influences PEU while VB and TB negatively influence PU.

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