Contribution to the study of the determinants of e-banking adoption in Moroccan Corporates

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Abstract: This study aims to identify the factors that promote or hinder the adoption of e-banking, through a field survey of Moroccan organizations. It examines how e-banking is accepted, adopted and used, as well as the challenges and implications in terms of transaction reliability and risk.

In order to understand the determinants influencing the adoption of e-banking by Moroccan organizations, we based ourselves on the Unified Technology Acceptance and Use Model (UTAUT). Our model is designed by extending the UTAUT model to include new variables deemed essential by the literature review, namely transaction reliability, perceived risk and institutional pressure.

The model developed is evaluated using an empirical study of 256 client organizations of Moroccan banks. The work is based on the statistical method of structural equations, which has a dual purpose: to test the content validity of the questionnaire, and to determine the best factor structure to fit the empirical data (Roussel & al., 2002).

Keywords: E-banking, UTAUT, expected performance, reliability of operations, perceived risk, institutional pressure, statistical method of structural equations.

Introduction

In the information and digitalization age, where everything is accessible via the Internet, lifestyles have completely changed, and organizations have reviewed their strategies to keep pace with technological developments. Banking is no exception.

In the early 2000s, online banks such as ING Direct[1] shook up the banking sector and changed the landscape. They made it possible for customers to carry out all transactions online, quickly, securely and without having to travel. Faced with competition from online banks, traditional credit institutions were called upon to irrevocably reconsider the way they operated.

The banking sector has thus undergone profound changes, prompting these establishments to evolve both structurally and strategically, leading them in particular to improve their practices in terms of creativity and innovation. In this vein, it's worth noting that advances in NICTs have revolutionized the way banks operate worldwide. A typology of innovations in banking was proposed by Karmarkar (2000), prioritizing services linked to new information and communication technologies.

Some authors consider e-banking to be the same as traditional banking, which also offers online banking, while others suggest that these financial institutions offer their services online only, and do not have a physical existence. Lau (1997) defines e-banking as "the delivery of banking services via the Internet directly to the customer's home address".

So we can say that the Internet is the cornerstone of electronic banking. E-banking sometimes has a broader meaning, encompassing a wide range of techniques, from the use of computers and telephones for banking purposes to ATMs. What's more, e-banking sometimes has an exclusively online meaning and comes as an adjunct to traditional banks. As such, e-banking is not a revolution, but rather an evolution that enables the bank to keep pace with change and meet the expectations and needs of its customers.

Throughout this article, we will attempt to shed some light on the behavior and adoption of e-banking, and explain the trends. We will seek to answer the following fundamental question: What are the main determinants of e-banking use by Moroccan companies?

Our concern to identify this problem led us to exhaust the theoretical studies developed in the literature, particularly E.M. Rogers' Diffusion of Innovations and V. Venkatesh's Unified Theory of Technology Acceptance and Use (UTAUT) (2003). It also led us to go out into the field to gather the required information from 256 Moroccan organizations.

The first part of this paper deals with the theoretical foundations of this research, presenting e-banking as a technological innovation. We will then present the conceptual model of our study, based on models of innovation behavior, and in particular the UTAUT model. Finally, a third part will be devoted to the field study and analysis of the results concerning the determining factors in the adoption of e-banking by Moroccan companies.

1- E-banking and innovation adoption theories

The innovation adoption process has been the subject of several studies for over 40 years and is one of the most popular adoption models. It was developed by Everette Rogers in her work "Diffusion of Innovations" (Sherry, 1997). Various disciplines have used this model as a theoretical framework. W.D. Stuart (2000) listed some as political science, public health, history, economics, technology,

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[1] ING Direct is a group headquartered in Amsterdam, born in 1991 from the merger between the NMB Postbank Groep and the insurer Nationale Nederlanden.

communication and education. These disciplines have used Rogers' theory as a theoretical framework to analyze the diffusion of technology.

1.1. The theory of diffusion of innovation (TDI)

Rogers' theory of diffusion of innovations (1983) is most appropriate for studying the adoption of technology in several fields (Medlin, 2001), including banking. Indeed, a significant number of works on the diffusion of innovations relate to technological innovations such that Rogers (2003) recurrently used the word "technology" and "innovation" as identical. For Rogers (2003: 13), a technology is the design of an action that reduces uncertainty in cause-and-effect relationships whose objective is the achievement of a desired result.

New technology consists of two parts, hardware and software. Although hardware is the tool that embodies technology in the form of a material or physical object, software is the information part of the tool (Rogers, 2003, 259). Since software, as a technological innovation, has a low level of user perception, its adoption rate is relatively quite slow.

Rogers (2003: 177) admits that adoption is a decision made out of conviction that the innovation is the best possible choice and that its rejection is a decision not to adopt it. The author considers diffusion as "the process by which an innovation is communicated through specific channels, over time and among the members of a given social system" (Rogers, 2003: 5). It emerges from this statement that innovation, communication channels, time and the social system are the four key components of the diffusion of innovations.

The consequences of an innovation can create transformations, even uncertainties and confusion: "Consequences are the changes that occur in individuals or a social system following the adoption or rejection of an innovation" (Rogers, 2003: 436). It should be noted that uncertainty is a significant obstacle to the adoption of an innovation. Individuals should therefore be informed of the advantages and disadvantages of it, which makes them aware of all its consequences.

The second element of diffusion of the innovation process refers to communication channels. For Rogers (2003: 5), communication is "a process by which participants create and exchange information with each other in order to achieve mutual understanding". This communication occurs through channels between information sources. Rogers (2003: 204) states that a source is a person or institution that is the originator of a message.

A channel is the means by which a message passes from the source to the receiver. Rogers certifies that diffusion is a specific type of communication and includes the following elements of communication: an innovation, two individuals or other adopting entities, and a communication channel. Mass media and interpersonal communication are two channels of communication. The former include television, radio or newspapers, interpersonal channels consist of two-way communication between two or more people.

The social system is the last element in the diffusion process. Rogers (2003: 23) views the social system as "a set of interdependent units engaged in joint problem solving to achieve a common goal." As the diffusion of innovations takes place in a social system, it is influenced by the social structure of this system. For the author, structure is "the arrangement of units in a system". He added that the nature of the social system influences the innovative trait of individuals, which is the main criterion for categorizing adopters (Rogers, 2003: 24).

1.2. Psychosocial models of behavior towards innovation

To explain the behavior of individuals regarding the use of technological innovations, several

theoretical models have been developed based on research in social psychology. Among these theories we find in particular, the technology acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT: Unified Theory of Acceptance and Use of Technology).

1.2.1. The Technology Acceptance Model

The technology acceptance model (TAM) is the most widely applied model to explain user acceptance and use of technology (Venkatesh, 2000). It was developed by Davis et al. (1992) and focuses on the two technology acceptance variables, namely ease of use and usefulness. This model assumes that when a person intends to act and will be free to act without limitation. In the real world, there will be many constraints, such as limited freedom of action (Davis & al., 1992).

The TAM is presented as an information systems theory that models the way in which users accept a technology. The model suggests that when users are introduced to a new technology, a number of factors influence their decision on how and when to use it, including:

- Perceived usefulness: According to Davis (1989), this is "the extent to which a person believes that using a particular system would improve their job performance".

- Perception of ease of use: this is "the extent to which a person believes that using a particular system would be effortless" (Davis, 1989).

The model has been continuously studied and developed. The two main updates being TAM 2 and TAM 3 (Venkatesh et al., 2000: 186-204). The latter was proposed in the context of electronic commerce by including the effects of trust and perceived risk on the use of new computer systems (Venkatesh & al., 2008: 273-315).

1.2.2. The unified model of technology acceptance and use

The Unified Theory of Acceptance and Use of Technology (UTAUT) is a model developed by Viswanath Venkatesh & al., in "User acceptance of information technology: Toward a unified view" (2003). UTAUT aims to explain users' intentions to approach an information system as well as their usage behavior. The theory holds that there are four key variables:

- Expected performance: the degree to which the user expects, that is to say to what extent the use of the system will help him to achieve gains in work performance. In mobile or Internet technology, expected performance is used to measure the objectives to be achieved for better performance.

- Expected effort: measures the ease of use associated with the adoption of an innovation. Venkatesh & al. (2003) consider expected effort as the degree of ease attached to using an information system.

- Social influence: reflects the effect of environmental factors and takes several forms such as peer pressure, leadership, obedience, conformity to beliefs, etc.

- Facilitating conditions: refer to the degree to which an individual believes that the required technical infrastructure exists and allows optimal use of the intended system.

The first three variables are direct determinants of usage intention and the fourth is a direct determinant of user behavior. Age, experience, gender and voluntary nature of use aim to moderate the impact of four key variables on usage intention and behavior:

Figure1: General configuration of the UTAUT model

Source : V. Venkatesh & al. (2003: 447).
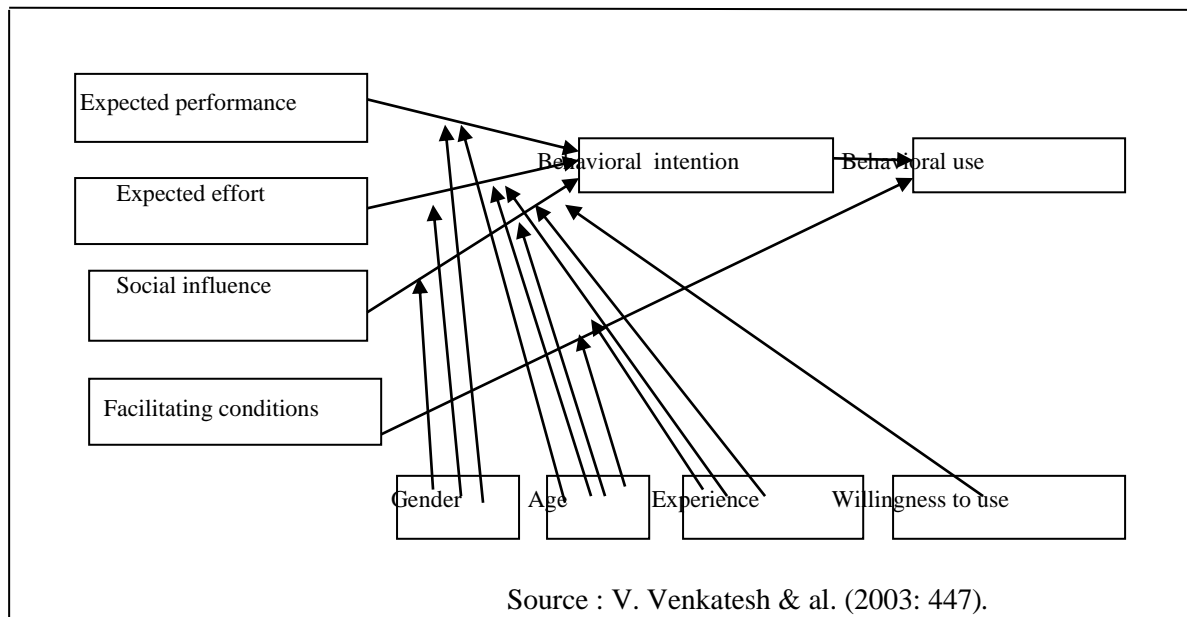
The UTAUT model seeks to establish a general framework to integrate into a single model all theories relating to adoption intention and theories of adoption strategies as well as theories of the use of information technologies. The objective is to be able to assess the impact of various factors on user intention and behavior.

1.2.2.1- UTAUT application

Since the arrival of UTAUT in 2003, several studies have used it to explain the adoption of different technological innovations. Among these researches, we find:

- Lin & Anol (2008) used UTAUT to seek to explain the adoption of instant messaging.

- Riffai & al., (2012), Martins et al., (2013) adopted UTAUT to explain the intentions of bank customers to adopt new banking services offered on the Internet.

- Martins & al. (2014) combine the UTAUT theory with perceived risk to explain the behavioral intention of using Internet banking services in Portugal. Their model explains 52% of the variance in behavioral intention and it increases to 56% when taking into account the moderating variables (age and gender).

- Eckhardt & al. (2009) applied the UTAUT to study the social influence of teams in the workplace (superiors, colleagues) on the intention to adopt a technological innovation in 152 German companies. They found the significant impact of peer social influence in the workplace on the adoption of information technology innovations.

1.2.2.2- UTAUT extension

Lin and Anol (2008) published an extension of the UTAUT model by integrating the influence of social networks on the use of innovations in information technologies. They surveyed 317 students in Taiwan about the contribution of social networks to the adoption of instant messaging and found that the influence of social networks is preponderant.

Sykes & al. (2009) proposed an acceptance model by adding a new variable (which is "peer support") to previous research on individual adoption of social networks in organizations. They conducted a

study on a sample of 87 employees of an establishment and found that the use of social networks can help to understand the use of new information systems.

Wang & al. (2009) integrated two concepts (perceived playfulness and self-management of learning) at UTAUT in the study of the determinants of acceptance of mobile learning among 370 people in Taiwan and found that these two variables have a significant impact on the behavioral intention to use e-learning among all respondents.

The UTAUT is therefore a model that was able to capitalize on previous research regarding the adoption of information technology and produce a unique and extensible model with very strong key concepts (Li & al., 2006).

2- Principle and Specification of the overall basic model via the SEM

In this study, we propose to formulate an explanatory framework allowing on the one hand, to understand the conditions which favored the development of an activity through the new distribution channel of online banking products and services and on the other hand, to identify the factors whose impacts are determining in the adoption of electronic banking. The model thus designed will contribute to the formalization of the study and its positioning in theoretical approaches relating to the context of use of new technologies and the adoption of innovations in the field of mobile banking and electronic transactions.

We will firstly recall the foundations of the basic model adopted and secondly we will define the key concepts and the variables used.

2.1. Foundations of the Basic Model

The adoption of innovations in the field of information and communication technologies has been the basis of several research studies. Over the past decades, a plethora of theory has developed and numerous models suggested to study the acceptance and use of information systems. These include the Theory of Reasoned Action (Fishbein & al., 1975), the Theory of Planned Behavior (Ajzen, 1991), and the Technology Acceptance Model (TAM) (Davis, 1989). All of these theories offered different explanations for the adoption of new technologies based on different factors relating to their technological attributions.

At the end of meticulously carried out work and a complete synthesis of several models, V. Venkatesh & al. (2003) proposed the unified theory of technology acceptance (UTAUT) which has since been widely disseminated and used by researchers in their quest to explain the adoption of technological innovations. While the original UTAUT model succeeded in explaining a wide variation in behavioral intention and use, it also highlighted that some relationships may not be applicable to all contexts while others relationships have not been presented but could prove important. At the same time, variables were not taken into consideration and could be decisive in explaining the adoption of technological innovations.

Remember that the acceptance models that served as a reference and were the subject of a synthesis are eight in number, namely TRA, TAM, TPB, C-TAM-TPB, MM, MPCU, SCT and TDI [1]. Venkatesh & al. (2003) found that these eight models explained between 17% and 53% of the variance in behavioral intention to use technological innovations. However, by mobilizing the same data, the UTAUT was ahead of all these models by explaining approximately 70% of the variance in behavioral intention and 50% of the behavioral use of innovations (Venkatesh & al. 2003; Venkatesh & al., 2012).

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[1]Theory of Reasoned Action, Technology Acceptance Model, Theory of Planned Behavior, Combined Theory of Planned Behavior/Technology Acceptance Model, Motivation Model, Personal Computer Use Model, Social Cognitive Theory , Theory of diffusion of innovations.

2.2. Model Variables and Assumptions

Since its emergence, UTAUT has been widely used to explain the adoption of information and communication technologies by individuals. However, few studies have kept the same variables put forward in the original model, which number four independent variables and four moderator variables, making eight in total (Venkatesh & al., 2012).

What sets UTAUT apart from previous models is that the first offers four moderating variables to further increase the predictive power of the model; these include age, gender, experience and willingness to use. A possible reason why these four moderators are ignored in some models is that they may not have a significant impact in the context of the studies performed. For example, the use of a particular new information system may have been decided by company management, so employees had no choice but to adopt it. In such a situation, the variable "willingness to use" as a moderator is not relevant and cannot be recommended.

Furthermore, the relationships proposed in the original UTAUT model can be reconsidered to reach a certain level of maturity of the model. In formulating the UTAUT, Venkatesh & al. (2003) pointed out that facilitating conditions could predict behavioral intention only if expected effort was not included in the model. This runs counter to previous theories of technology acceptance which have explicitly demonstrated that the relationship between facilitating conditions and behavioral intention is significantly established. Studies have in fact demonstrated that facilitating conditions significantly influence behavioral intention, even in the presence of the expected effort variable (Duyck, 2008; Foon, 2011).

Finally, the original UTAUT model can be reconsidered in the light of other concepts that can explain the adoption behavior of innovations by individuals. The four variables of the UTAUT model can be grouped into two parts. The first represents the technological attributes including expected performance and expected effort. The second part includes social influence and facilitating conditions as contextual factors.

Although all the variables described in the UTAUT model have an effective influence on the intention to use and the current adoption of a technological innovation, the context of the present study forced us to make the necessary adaptations. Indeed, the moderating variables relating to the profiles of individuals should be modified to match the composition of our sample which concerns companies and organizations. Thus, we replaced the variables age of the individual, experience, gender and willingness to use by age and size of the company.

The choice of the age of the company is justified by the fact that companies which have reached a certain level of maturity are more favorable to the adoption of new technologies than young companies, according to Stinchcombe (1965). Regarding the size of the firm, it represents an indicator of consistency in its ecosystem and could be a determining factor in the adoption of innovations. As such, several researchers such as Amponsah (1995) have confirmed the positive relationship between the size of the company and its innovativeness; large companies having a much greater tendency to adopt innovations than smaller ones.

With the same aim of adapting the UTAUT model and following the recommendations of Venkatesh and al. (2003), other variables were integrated as a complement, to take into consideration the context of electronic banking. Thus, three complementary variables enriched the basic model. These are perceived risk, reliability of operations and institutional and administrative pressure. Perceived risk is inspired by the model of Lee (2009) and Tan (2010). It is considered a significant factor in the life of electronic banking. Regarding the "operations reliability" variable, it is inspired by the work of Wolfinbarger & al. (2003) and measures a service efficiently accomplished, in the required time, with accurate data. And finally, institutional pressure was presented by King & al. (1994) as a legal administrative stimulus favoring the adoption of technological innovations by companies.

Ultimately, the research model inspired by the literature review and by UTAUT more particularly, takes the following form:

Figure 2: Research model selected

Source: Developed by us based on the UTAUT model.
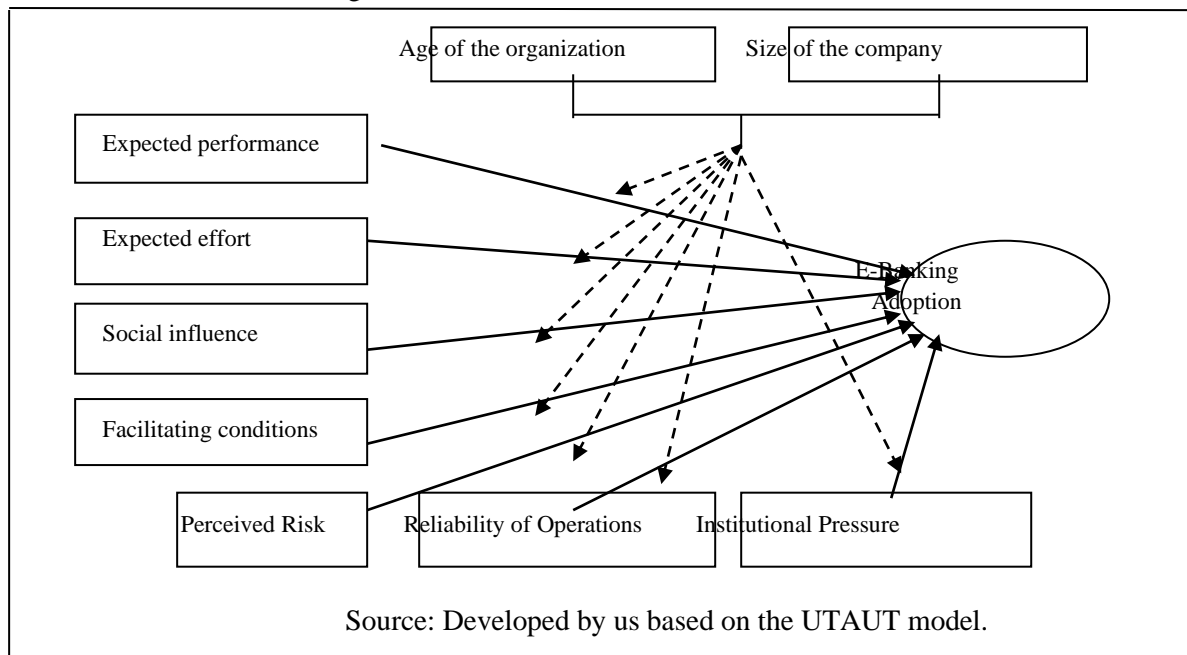
The proposed model therefore includes seven independent variables and two dependent variables. The 'operationalization' of these variables required the creation of twenty-seven (27) measurement scales inspired by work on the adoption of innovations in general and the adoption of new information technologies in particular.

Other measurement scales were also included in the questionnaire. They concern the control variables relating to the age of the company and its size.

Concerning the dependent variable "Adoption of e-banking" under the code "Adopt", two questions were asked to acquire information on the use of e-banking by the respondents:

• Did you use e-banking in the transactions of your organization?
• If yes, in what area do you use e-banking?

The independent variables and the dependent variable (Adopt) thus defined will be compared by formulating the following seven hypotheses:

- Expected performance has a positive effect on the intention to use electronic banking (H1).

- Expected effort has a negative effect on the intention to use electronic banking (H2).

- Social influence has a positive effect on the intention to use electronic banking (H3).

- Facilitating conditions have a positive effect on the intention to use electronic banking (H4).

- Perceived risk has a negative effect on the intention to use electronic banking (H5).

- Reliability of operations has a positive effect on the intention to use electronic banking (H6).

- Institutional pressure has a positive effect on the intention to use electronic banking (H7).

These working hypotheses will be tested taking into account the overall model that we have designed using the robust method of structural equations.

3- Explanatory analysis of the results of the empirical study

We will attempt to validate this model at different levels, namely the measurement model, the structural model and the structural model with moderating variables (see Appendices 1 to 3).

As part of this study on the determining factors of the adoption of e-banking in Morocco, we mainly used the AMOS module from IBM-SPSS to evaluate our model.

3.1. Analysis of the measurement model and model quality

Identifying the behavior of observed variables from their constructs (latent variables) is the main function of measurement models (Byrne, 2010). In this vein, Arbuckle (2005) stated that the best tool for researchers to explain the links between observed variables and unobserved variables (exogenous variables) is the application of measurement models.

3.1.1. Evaluation of the measurement model

In order to determine the validity of the measurement model, we were led to analyze the reliability and validity of the constructs, the Cronbach Alpha coefficient, the composite reliability (CR: Composite Reliability), the average variance extracted (AVE: Average Variance Extracted), discriminant validity and convergent validity.

3.1.1.1. The reliability of constructs

Reading Table 1 shows that the two constructs "Reliability of Operations" and "Institutional Pressure" displayed Alpha Cronbach scores amounting to 0.601 and 0.633 respectively. On the other hand, all the other constructs generally presented a consistent level of internal consistency ranging from "acceptable" to "good", as recommended by Nunnally (1978).

Composite reliability (CR) is also carried out to check the reliability of the constructs. Bagozzi & Yi (1988) indicated that to achieve consistent internal reliability, a score above 0.6 must be met, which is the threshold for acceptance of composite reliability (CR) analysis. For the present study, all constructs reached and sometimes exceeded the acceptance threshold of 0.6.

Table 1: Reliability of constructs analysis according to Alpha Cronbach and CR

Latentes Variables	Indicator	Alpha Cronbach	CR: Composite Reliability
Expected Performance	PerExp(x)	0,882	0,886
Expected Effort	EffExp(x)	0,818	0,809
Facilitating Conditions	CondFaci(x)	0,844	0,857
Social Influence	InflSoc(x)	0,709	0,812
Perceived Risk	RiskPer(x)	0,814	0,720
Reliability of operations	ReliOpe(x)	0,601	0,603
Institutional Pressure	PresInst(x)	0,633	0,598

Source: Prepared by us from the survey using SPSS, AMOS and Excel.

Thus, by analyzing this table, we can be able to affirm in particular that the two variables "reliability of operations" and "institutional pressure" are relevant with regard to composite reliability. On the other hand, the associated Cronbach Alpha coefficients are slightly lower than the required threshold. Indeed, according to Bagozzi & Yi (2012), the interpretation of the Cronbach Alpha index is a little more flexible in structural equation methods (SEM).

3.1.1.2. Convergent validity of constructs

To test the convergent validity of the constructs, the composite reliability (CR) and the average variance extracted (AVE) were calculated (see Appendix II) and analyzed jointly in Table 2 below. This table presents the results of CR and AVE for all constructs. In practice, you must first assess the loadings of all the indicators and ensure that they validate the threshold of 0.5 and above. Indeed, we notice that there are four indicators whose loading is less than 0.5. These are PresInst3, PresInst4, ReliOpe3 and ReliOpe4. To purify the variables, we only keep the indicators whose loading threshold is acceptable (Hair & al., 2010).

Regarding composite reliability (CR), the acceptance threshold is 0.6. The average variance extracted (AVE) has an acceptance threshold of 0.45 (Hair and al., 2010).

Table 2: Analysis of convergent validity

Indicator variables	<---	Latent Variables	Estimate	CR	AVE
PerExp5	<---	Expected Performance	0,6770		
PerExp4	<---	Expected Performance	0,8490		
PerExp3	<---	Expected Performance	0,9010	0,886	0,733
PerExp2	<---	Expected Performance	0,7820		
PerExp1	<---	Expected Performance	0,6780		
EffExp3	<---	Expected Effort	0,623		
EffExp2	<---	Expected Effort	0,833	0,809	0,712
EffExp1	<---	Expected Effort	0,828		
CondFaci3	<---	Facilitating Conditions	0,788		
CondFaci2	<---	Facilitating Conditions	0,89	0,857	0,782
CondFaci1	<---	Facilitating Conditions	0,766		
InflSoc3	<---	Social Influence	0,787		
InflSoc2	<---	Social Influence	0,796	0,821	0,718
InflSoc1	<---	Social Influence	0,72		
RiskPer5	<---	Perceived Risk	0,694		
RiskPer3	<---	Perceived Risk	0,594	0,724	0,596
RiskPer1	<---	Perceived Risk	0,757		
ReliOpe1	<---	Reliability of operations	0,851		
ReliOpe2	<---	Reliability of operations	0,701		
ReliOpe3	<---	Reliability of operations	0,216	0,630	0,516
ReilOpe4	<---	Reliability of operations	0,248		
PresInst4	<---	Institutional Pressure	0,414		
PresInst3	<---	Institutional Pressure	0,47		
PresInst2	<---	Institutional Pressure	0,52	0,601	0,445
PresInst1	<---	Institutional Pressure	0,512		

Source: Prepared by us from the field survey using AMOS.

As can be seen in the table above, the construct "Institutional Pressure" is within the acceptable limit (0.598) with regard to the CR and it is below the acceptance threshold (0.445) with regard to the AVE. On the other hand, the other constructs overall showed an acceptable level whether for the CR or for the AVE.

3.1.1.3. The discriminant validity of the constructs

Basically, discriminant validity means that the measurement ability of an indicator can generate different results from indicators of other constructs. The analysis in this respect requires that all correlations of the construct with the statements of the other variables are lower than the square roots of the AVE (Boudreau & al., 2000; Fornell & Larcker, 1981; Gefen & Straub, 2005). According to the following table 3, the discriminant validity of the constructs is observed.

Table 3: Discriminant validity (square root of AVE and correlation between constructs)

	Expected Performance	Expected Effort	Facilitating Conditions	Social Influence	Perceived Risk	Reliability operations	Institutional Pressure
Expected Performance	0,857						
Expected Effort	0,651	0,844					
Facilitating Conditions	0,406	0,382	0,847				
Social Influence	-0,138	-0,295	-0,200	0,718			
Perceived Risk	0,155	0,156	0,256	-0,027	0,772		
Reliability of operations	0,559	0,564	0,491	0,272	0,276	0,718	
Institutional Pressure	0,468	0,544	0,300	-0,178	0,615	0,338	0,667

Source: Prepared by us from the field investigation using AMOS.

Reading the results obtained from the validity analysis of the constructs, we understand that the conditions required to move on to the next step, namely the evaluation of the quality of the model, are ensured.

3.1.2. Model quality assessment

The AMOS module offers the possibility of choosing an analysis method and offers several indices that must be subject to acceptance thresholds. The test method used in our study is that of maximum likelihood (ML: Maximum Likelihood).

According to the values indicated in Table 4 below, and taking into account the results of the analysis of the quality of the model, we can affirm that the quality of the model is acceptable. Indeed, the value of CMIN/DF (2.297) which is below the acceptable threshold of 3.00. The same is for the RMSEA with a value of 0.062 which is lower than the threshold of 0.08. The SRMR is also below the threshold of 0.08 with a value of 0.0724. Whereas, the CFI and the IFI, both are fair within the acceptable threshold of 0.9.

Table 4: Model quality indices

Quality of the Model Indice	Acceptance threshold	Value obtained
CMIN/DF (minimum discrepancy/Degree of Freedom)	Less or equal to 3,00	2,509
CFI (Comparative Fit Index)	Superior than 0,9	0,856
IFI (Incremental Fit Index)	Superior than 0,9	0,850
RMSEA (Root Mean Square Error of Approximation)	Less than 0,08	0,067
Standardized Root Mean Square Residual (SRMR)	Less 0,08	0,072
Chi-Square/DF Chi-Square (X2)= 745,031 ; DF = 297	Less 3,00	2,50

Source: Prepared by us from the field survey through AMOS.

From these analyses, it appears that our structural model for the present study significantly meets the minimum quality required (i.e. the result displayed by Amos: Minimum was achieved).

3.2. Structural model analysis

After validation of the measurement model and the quality of the model, it will be necessary to evaluate the structural model and test the different hypotheses formulated. Table 5 below presents the results obtained by AMOS using the "Maximum Likelihood" method.

Table 5: Result of structural model analysis

			Estimate (β)	S.E.	C.R.	P	Comment
Adopt	<---	Expected Performance	-,194	,066	-2,929	,003	**Corroborated**
Adopt	<---	Expected Effort	-,124	,070	-1,757	,079	**Corroborated**
Adopt	<---	Facilitating Conditions	,089	,058	1,522	,128	Uncorroborated
Adopt	<---	Social Influence	,042	,046	,894	,371	Uncorroborated
Adopt	<---	Perceived Risk	-,292	,056	-5,188	***	**Corroborated**
Adopt	<---	Reliability of operations	,258	,068	3,819	***	**Corroborated**
Adopt	<---	Institutional Pressure	,675	,144	4,686	***	**Corroborated**

Source: Prepared by us from the field survey using AMOS.

This table allows to identify the significant links between the independent variables and the dependent variable (Adopt) by comparing them with the seven hypotheses formulated.

• **Expected Performance:**

The analysis shows the existence of a significant but negative link (β = -0.194, P-value = 0.003) between expected performance and the adoption of e-banking. The first hypothesis is identified by a positive significant link on the adoption of e-banking. Therefore, hypothesis (H1) is then not corroborated.

• **Expected Effort:**

The results confirm the existence of a fairly acceptable negative significant link (β = -0.124, P-value = 0.079 less than 0.1) between the expected effort and the adoption of e-banking. The second hypothesis is validated. Indeed, the greater the effort exerted by e-banking users, the less e-banking services are used.

• **Social Influence:**

According to the results obtained, there is no significant relationship between social influence and the adoption of e-banking by organizations (β =0.042, P-value = 0.371). The fact that a user is influenced by his superiors, his peers or his competitors has no influence on the adoption of e-banking. Hypothesis (H3) is therefore not supported.

• **Facilitating Conditions:**

For this hypothesis, there is also no significant relationship between facilitating conditions and the adoption of e-banking. It is therefore not validated (β =0.089, P-value = 0.128). This result implies that even if all the conditions favorable to the adoption of e-banking are implemented for the benefit of organizations, this will not produce any effect.

• **Perceived Risk:**

The results obtained confirm the significantly negative link between perceived risk and the adoption of e-banking. Hypothesis (H5) is thus corroborated (β = -0.292, P-value = *** very significant). This means that the more the use of e-banking is perceived as a source of risk by organizations, the more they will not intend to use it.

• **Reliability of operations:**

The tests carried out reveal the existence of a very significant and positive link between the reliability of operations and the adoption of e-banking. The sixth hypothesis is therefore confirmed (β =0.258, P-value = *** very significant). This implies that organizations do not skimp on the reliability of online banking operations. It is considered an important condition to meet in order to join.

• **Institutional pressure:**

The results of the analysis highlight a very significant positive link between institutional pressure and the adoption of e-banking. Hypothesis (H7) is thus corroborated (β =0.675, P-value = *** very significant). Indeed, the use of pressure by administrative and fiscal institutions, in particular through the pure and simple elimination of traditional procedures or through the establishment of a series of fines for those who resist, is considered positive in this regard which concerns the use of e-banking services by organizations.

3.3. Analysis of the structural model taking into account the moderating variables

Moderating variables, or simply moderators, have an effect on the intensity or direction of the effect of

a relationship between an independent variable and a dependent variable (Baron and Kenny, 1986). They can be qualitative or quantitative.

To measure the effect under the AMOS module, of a moderating variable (VarMod) on the relationship between an independent variable (VarInd) and a dependent variable (VarDepY), we create a new variable (VarInd*VarMod), as recommended by Lacroux (2011). In the case of a latent variable, we must multiply these items by the moderating variable and we generate new latent quantities by the items thus created.

As part of this study, two moderating variables were identified: the age and the size of the organization. To test and analyze their effect, we constructed three intermediate multiplicative quantities for each of the latent exogenous variables. The moderators were tested separately with a single independent variable given the complexity of the model.

Concerning the moderating variable "Age", only one independent variable which is the expected performance is tested. The same work is done again for the other six latent variables. For the other moderating variable "Organization size" the same principle is applied. All the results obtained from the moderating effect of the tow moderating variables on the seven latent exogenous variables are recorded in the three tables 6 and 7 below.

The results of the tests of the moderating effect of the moderating variables (Age and Size) are interpreted in the following.

• **The moderating effect of the variable Age of the organization**

The results presented in Table 6 above, relating to the effect of the moderating variable age of the organization on the relationships between the exogenous variables and the adoption of e-banking show that there is no significant moderating impact on the variables: expected performance, expected effort, facilitating conditions and social influence. On the other hand, a moderating effect on three exogenous variables is confirmed:

Table 6: Result of The moderating effect of the variable Age

Independent Variable	←	Estimated (Loding)	Significant	Result
Expected Performance	Adopt ← ExpectedPerformance	-0,269	0,489 (Not-Signif)	Rejected
	Adopt ← AgeOrg	-0,036	0,932 (Not-Signif)	
	Adopt ← AgeExpectedPerformance	0,013	0,898 (Not-Signif)	
Expected Effort	Adopt ← ExpectedEffort	-0,048	0,603 (Not-Signif)	Rejected
	Adopt ← AgeOrg	0,062	0,493 (Not-Signif)	
	Adopt ← Age ExpectedEffort	-0,011	0,621 (Not-Signif)	
Facilitating Conditions	Adopt ←FacilitatingConditions	-0,001	0,995 (Not-Signif)	Rejected
	Adopt ← AgeOrg	-0,071	0,761 (Not-Signif)	
	Adopt ← AgeFacilitatingConditions	0,020	0,697 (Not-Signif)	
Social Influence	Adopt ←SocialInfluence	0,011	0,779 (Not-Signif)	Rejected
	Adopt ← AgeOrg	0,006	0,882 (Not-Signif)	
	Adopt ← AgeSocialInfluence	0,004	0,727 (Not-Signif)	

Perceived Risk	Adopt ← Perceived Risk	-0,094	0,042 (Significant)	**Confirmed**
	Adopt ← AgeOrg	0,161	0,005 (Significant)	
	Adopt ← AgePerceived Risk	-0,039	0,010 (Significant)	
Reliability of operations	Adopt ←ReliabilityofOperations	-0,025	0,023 (Non-Signif)	**Confirmed**
	Adopt ← AgeOrg	-0,149	0,018 (Significant)	
	Adopt ←AgeReliabilityofOperations	0,041	0,006 (Significant)	
Institutional Pressure	Adopt ←InstitutionnalPressure	0,001	0,086 (Non-Signif)	**Confirmed**
	Adopt ← AgeOrg	-0,097	0,043 (Significant)	
	Adopt ← AgeInstitutionnalPressure	0,032	0,011 (Significant)	

Source: Prepared by us from the field survey using AMOS.

- Perceived risk: the age of the organization has a moderating effect between perceived risk and the adoption of e-banking. The analysis shows that the majority of participating organizations are organizations over 10 years old, up to 65%. In addition, the moderating effect of age is negative, which is consistent with the test result without a moderating variable. This observation supports the findings of the literature review. The more the perceived risk is controlled thanks to age and experience, the more companies use the e-banking service.

- Reliability of operations: the age of the organization also has a moderating effect between the reliability of operations and the adoption of e-banking. This finding is consistent with the result of the analysis of this relationship without the moderating effect of age. It is also consistent with numerous previous studies (Stiakakis & Georgiadis, 2009: 410-430, Frei & al., 1999: 1210-1220, Rexha & al., 2003). Indeed, the reliability of operations represents a guarantee of security for the good provision of e-banking services and it is considered as a determinant exerting a positive influence on the adoption of e-banking.

- Institutional pressure: according to the analysis carried out, the age of the company does have a moderating effect between institutional pressure and the adoption of e-banking. Even if the direct link has become irrelevant, the multiplicative mechanism leads, with the introduction of the age factor, to a significant overall result. King & al. (1994) presented institutional pressure as an administrative-legal stimulus favoring the adoption of technological innovations by companies.

• **The moderating effect of the variable Size of the organization**

The results presented in Table 7 above, relating to the effect of the moderating variable size of the organization on the links between the independent variables and the adoption of e-banking indicate that there is no impact on the variables expected performance, expected effort, social influence and perceived risk. The moderating effect operates on three independent variables:

Table 7: Result of The moderating of the variable Size effect

Independent Variable	←	Estimated (Loding)	Significant	Result
Expected Performance	Adopt ← ExpectedPerformance	1,071	0,145 (Not-Signif)	Rejected
	Adopt ← SizeOrg	1,836	0,096 (Not-Signif)	
	Adopt ← SizeExpectedPerformance	-0,457	0,092 (Not-Signif)	
Expected Effort	Adopt ← ExpectedEffort	-0,099	0,885 (Not-Signif)	Rejected
	Adopt ← SizeOrg	-0,017	0,983 (Not-Signif)	
	Adopt ← SizeExpectedEffort	-0,003	0,988 (Not-Signif)	
Facilitating Conditions	Adopt ← FacilitatingConditions	1,948	0,017 (Significant)	**Confirmed**
	Adopt ← SizeOrg	2,920	0,022 (Significant)	
	Adopt ← SizeFacilitatingConditions	-0,636	0,021 (Significant)	
Social Influence	Adopt ← SocialInfluence	0,054	0,489 (Not-Signif)	Rejected
	Adopt ← SizeOrg	-0,017	0,830 (Not-Signif)	
	Adopt ← SizeSocialInfluence	-0,004	0,890 (Not-Signif)	
Perceived Risk	Adopt ← Perceived Risk	-0,027	0,831 (Not-Signif)	Rejected
	Adopt ← SizeOrg	0,220	0,117 (Not-Signif)	
	Adopt ← SizePerceived Risk	-0,068	0,084 (Not-Signif)	
Reliability of operations	Adopt ← ReliabilityofOperations	-0,150	0,009 (Not-Signif)	**Confirmed**
	Adopt ← SizeOrg	-0,318	0,018 (Significant)	
	Adopt ← SizeReliabilityofOperations	0,072	0,012 (Significant)	
Institutional Pressure	Adopt ← InstitutionnalPressure	0,051	0,069 (Not-Signif)	**Confirmed**
	Adopt ← SizeOrg	-0,192	0,015 (Significanf)	
	Adopt ← SizeInstitutionnalPressure	0,040	0,048 (Significant)	

Source: Prepared by us from the field survey using AMOS.

- Facilitating conditions: the size of the organization has a significant moderating effect between facilitating conditions and the adoption of e-banking. On the other hand, the result of the factor analysis showed that there is no significant link, as we could see in the second section of the third chapter relating to our chosen research model. For its part, the literature review revealed that there is indeed a significant relationship. Thus, the introduction of the moderating variable confirmed the hypothesis of the convincing relationship between facilitating conditions and the adoption of e-banking.

The descriptive analysis showed that very small companies with fewer than 10 employees represent the majority, or 44.1% of the entities surveyed. This could suggest that small businesses would seek to ensure that the required technical and organizational infrastructure is available to engage in e-banking operations. Note that previous research has highlighted that facilitating conditions really influence the behavioral intention to adopt new technologies (Duyck & al. 2008, Foon & al., 2011, Loo & al., 2009).

- Reliability of operations: like the age of the organization, its size has a moderating effect between the reliability of operations and the adoption of e-banking. This observation supports the result of the analysis of this relationship without the moderating effect of age. Indeed, the reliability of operations is considered to be a determinant influencing the adoption of e-banking.

- Institutional pressure: finally, the size of the organization has a moderating effect between institutional pressure and the adoption of e-banking. This relationship is negative, which indicates that small businesses are more likely to comply with regulations and recommendations from administrative and tax authorities in the field of e-banking and online services.

Conclusion

Research on factors influencing customer adoption of online banking is a result of the phenomenal progress in information technology (IT). Considered one of the most fundamental forces of change in the financial services industry and coupled with innovative business thinking, IT has transformed the way financial services are designed and delivered. The development of secure internet services has enabled banks and financial institutions to engage in real integration of online banking systems with a view to complementing their traditional service channels, namely counters, ATMs, automated teller machines, etc.

With the introduction of e-banking, organizations have been able to accomplish a wide range of Internet banking transactions using secure websites anytime, anywhere, and with substantial cost savings compared to traditional banking services. offered by physical branches and agencies of banks (Alsajjan & Dennis, 2010).

Throughout this study, we attempted to answer the central question, namely the identification of factors influencing the adoption of e-banking by organizations in Morocco. It appears that the adoption of e-banking is mainly influenced by two pairs of variables:

- Expected effort and perceived risk: these two variables negatively influence the use of e-banking by Moroccan organizations.

- Reliability of operations and institutional pressure: have a positive effect on the adoption of electronic banking.

Note, however, that certain variables turned out to be irrelevant; this concerns expected performance, facilitating conditions and social influence, unless the effect of moderating variables is possibly taken into account in the model

In light of these results and with a view to improving the rate of adoption of e-banking by organizations in Morocco, banks are called upon to popularize their online financial services, offer relatively easy-to-use services, plan a service offering with solid security measures in order to best manage the risks assumed and improve the required reliability of the processes.

The authorities, for their part, can influence the adoption of e-banking through the institution and implementation of more rigorous and more adapted legislation. Joint measures are in fact to be expected between financial and state institutions in terms of user protection policy in order to limit financial losses and confront infiltration and fraud.

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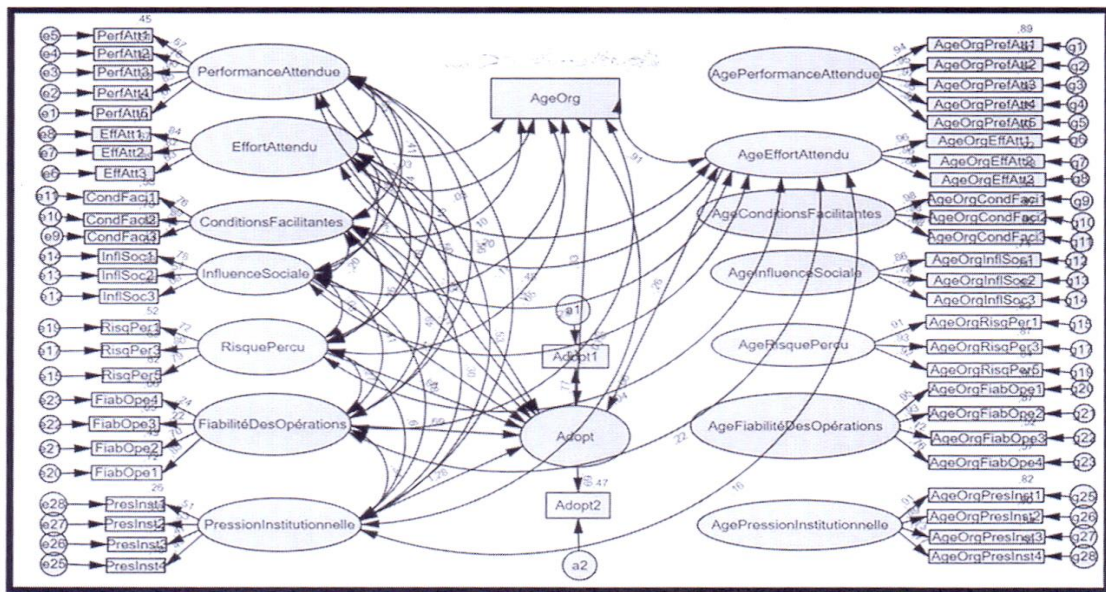
APPENDICES:

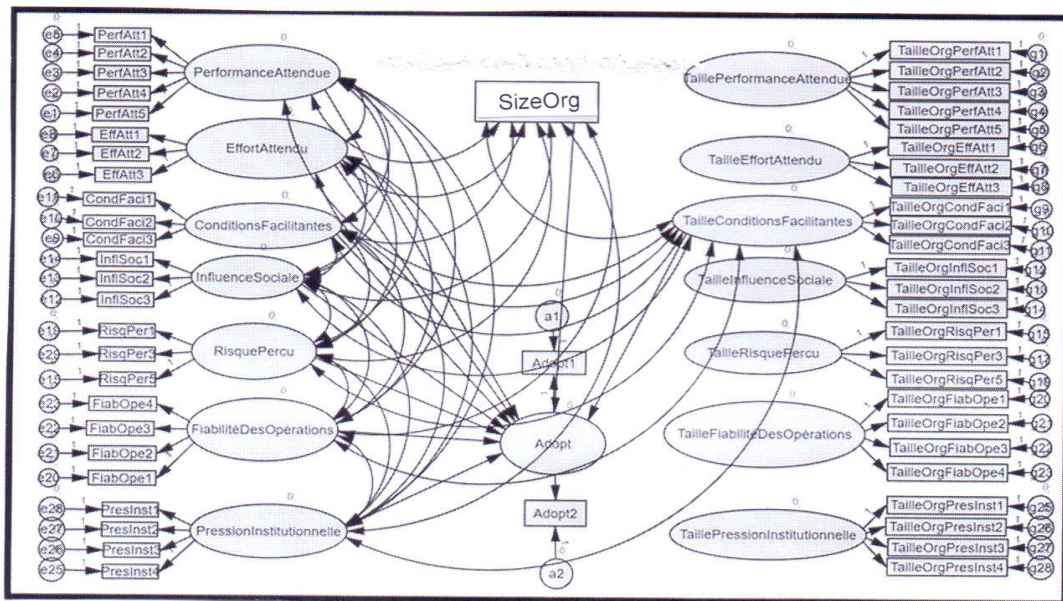Appendix 1: General structural model under Amos
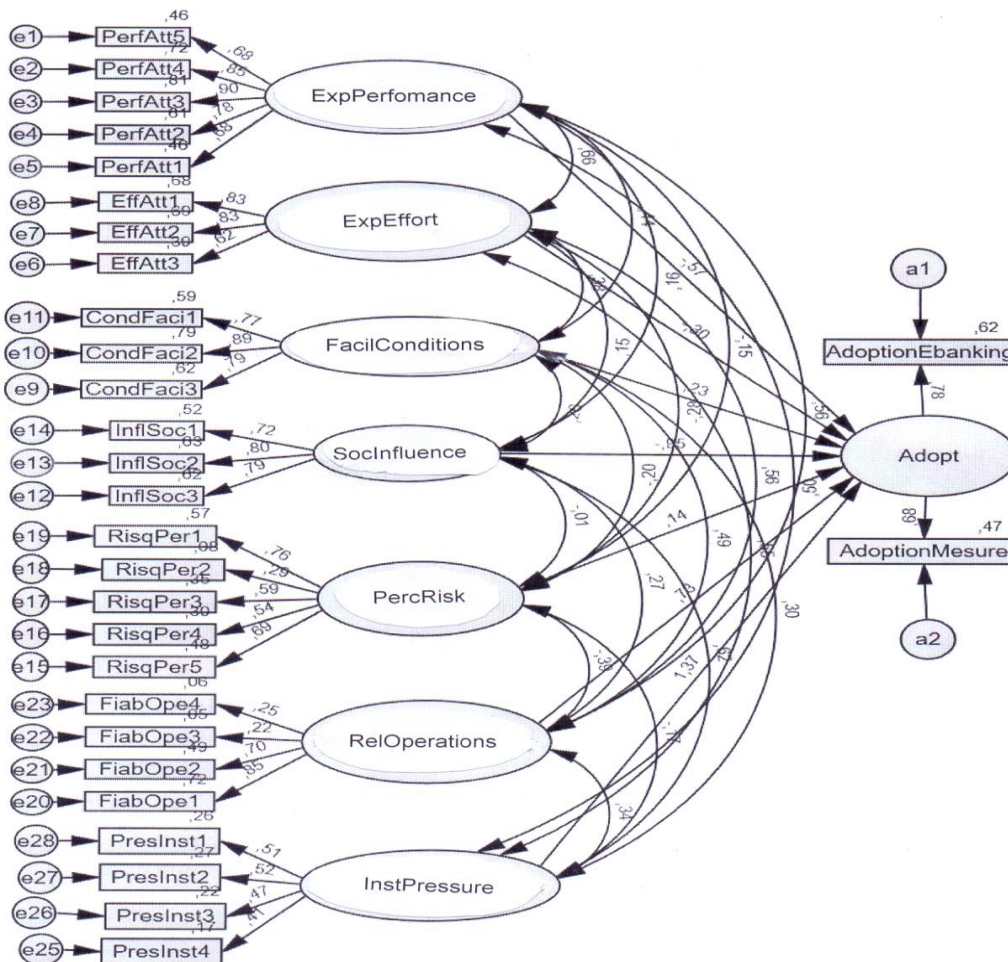
Source: Prepared by us using AMOS.

Appendix 2: AMOS model for testing the moderating effect of "AgeOrg"

Source: Prepared by us using AMOS.

Appendix 3: AMOS model for testing the moderating effect of "SiszeOrg"

Source: Prepared by us using AMOS.