

Predictors of E-banking Service Adoption in Malaysia Using an Extended Technology Acceptance Model

Owais Barkat Al-Gharaibah ¹

¹, Taibah University, College of Business Administration, Marketing Department,
Email: ograibah@taibahu.edu.sa

<p>Article history Submitted: 7 November, 2020 Revised: 15 November, 2020 Accepted: 29 November, 2020</p>	<p>Abstract Electronic banking (E-banking) is a service that can ease the financial transaction. However, users have several concerns when dealing with online banking. This paper aims to develop an extended a model to predict and explain customers' behavioural intentions with regard to adopting online banking. The proposed model incorporates four variables to provide a more comprehensive investigation about online banking. Data was collected from graduate students in Malaysia. The results show that the proposed model has moderate explanatory power. In addition, the results ease of use and customer attitude are significantly related to the adoption of E-Banking. In contrast perceived usefulness and risk have no significant association with the adoption of E-banking. Decision makers have to ensure that the E-banking is easy to use and have to provide clear instruction for using the services.</p>
<p>Keywords: <i>E-banking</i> <i>TAM</i> <i>Usefulness</i> <i>Ease of use</i></p>	

1. Introduction

The competitive strategy of commercial banks all over the world has shifted from focusing on acquiring new customers to customer retention [1]. Nowadays, the electronic technology is playing a major role for the world of business especially in banking activities [2]. Electronic banking (e-banking) is the newest delivery channel for banking services. It is an extraordinary development in the financial service industry that has been witnessed in this millennium, as a result of the swift development technologies, referred to as e-developments [3], [4]. These improvements have encased all parts of financial intermediation and financial markets, such as, e-finance, e-money, electronic banking (e-banking), e-brokering, e-insurance, e-exchanges, and even e-supervision. This new IT (information technology) has turned out as the most substantial aspect in the potential development of banking, which influence marketing and business strategies of banks [5]–[7]. Due to the quick developments in IT, and extensive competition in the banking sector, E-banking has been significantly adopted, and used as a route of syndication for financial services [8]–[11].

Electronic banking has encountered intense development and has modified conventional banking techniques [12], [13]. In Malaysia, massive venture in telecommunication networks and several e-banking services by commercial banks could be observed as an attempt towards gauging the international standards [14]. This is amongst other reasons including, higher customer requirement, higher competition among banks; obtain reduced cost, newcomers, and superior service delivery [15], [16]. Nevertheless, reflecting the progression of e-developments, the usage and dissemination of e banking is far from persistence, particularly between the developed and developing countries. However, it is presumed that, in the long term, developing nations could gain more from e-banking as against their developed counterparts, because they might push their technological development by gaining knowledge from the experiences of the developed nations [8]. Nevertheless, during this development processes, it is estimated that, the developing countries might face several unforeseen and complicated aspects, which restrict the velocity and level of adopting e-banking [10].

There is lack of studies in the developing countries, where commercial banks are striving to present e-banking systems to enhance their businesses, minimize expenditures and maximize efficiency. Consequently, this indicates that, e-banking has turning out as a tactical tool employed in the dissemination channel for their products due to intensive competition from both, local and international markets. On the other hand, the initiatives geared towards establishing superior and less complicated electronic banking systems appear to have stayed generally unseen by the clients, who are yet to completely value the accessibility of these services in the financial industry.

There is need to discover aspects to which restrict adoption and diffusion E-banking? In addition, there is a need to understand those that might impact perception or behaviour of customers towards the adoption of E-banking. These challenges are crucial to be addressed because it contains the key that will facilitate the banking industry to prepare their marketing techniques for promoting new forms of electronic banking systems in the future. Consequently, for addressing the existing gap in the literature, and encourage further e-banking adoption in developing countries, it is crucial to better understand the drivers and barriers influencing perception of customer towards e-banking adoption.

In this context, this research aims at extending the Technological Adoption Model (TAM): to integrate the role of perceived risk in impacting perception of customers towards adopting e-banking. The extended TAM has been empirically assessed to authenticate its application in influencing adoption of E-banking in Malaysia.

2. Literature Review

Electronic banking (E-banking) is the most recent distribution channel of banking services. A number of studies have given various definitions of E-banking, because electronic banking symbolizes numerous kinds of services, by which customers of a bank can inquire information and conduct majority of their banking transactions through computers or mobile phones [17]. Electronic banking, also referred to as an Electronic Fund Transfer (EFT) has been defined as the use of computer and electronic technology as an alternative for checks and other paper transactions. EFT has been started by means of devices such as cards or codes, which allows an individual, or those authorized by them, to access the individual's account [18]. A lot of financial institutions use ATM or debit cards and Personal Identification Numbers (PINs) for this purpose. Some use other types of debit cards, such as, those that need at most, one's signature or a scan. Furthermore, electronic banking might be regarded as a variety of the following: Internet banking (or online banking), telephone banking, TV-based banking, mobile phone banking and E-banking (or offline banking) [19], [20].

Human and technology-based delivery channels have been significantly associated with the perceptions of customers, in terms of services delivered by these banks. They have outlined that these intuitive results might influence the degree of bank-customer-satisfaction, preservation, and changing [21], [22]. Nevertheless, for e-banking technologies in terms of improving efficiency, they must be accepted by targeted users [23]. the research in comprehending user acceptance of new technology has triggered a number of theoretical models with origins in information systems, psychology, and sociology [23].

E-banking technology has been designed to develop banking sector, and also to fulfil needs of customers. E-banking technology has a number of positive aspects associated with society, banks, and customers. Consequently, e-banking has swiftly multiplied across the globe [24]. E-banking technology has appropriate solution for problems associated with quality in banking services; service quality has been defined as the difference between needs and expectations of customers about particular service and the actual features of this service that was introduced to customers [25].

This present study has proposed the application of the Technology Acceptance Model (TAM) to record the factors, which substantially impact the perception of customers towards e-banking adoption. TAM is one of the popular models for examining IT acceptance [26] [27]. The TAM includes two major variables for the potential adopter: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) of technology, which determine the attitudes of users toward a new technology. PU is the degree to which an individual considers that, applying a specific system might improve his or her job efficiency; while PEOU is the degree to which an individual feels that, a specific system would be effortlessly used [26]. These two beliefs generate an ideal attitudinal objective towards using the IT, which subsequently impacts its self-reported use [26]. The theoretical background of TAM has been based on the Theory of Reasoned Action (TRA), and it has been exclusively customized for comprehending user acceptance of information system model [28]. The theory measures that, an individual's behavioural intention is the instantaneous motive of behaviour, their attitude and subjective norm are mediated through behavioural intention [26]. Based on TAM and the literature, this study proposed the following hypotheses.

H1: Perceived usefulness has is positively related to Adoption of E-banking services.

H2: Perceived Risk is positively related to Adoption of E-banking services.

H3: Perceived ease of use is positively related to Adoption of E-banking services.

H4: Customers attitude has a significant is positively related to Adoption of E-banking services.

3. Data Collection and Theoretical Model

We have developed a model for predicting Adoption of E-Banking services. We had data gathered from 116 graduate students from UKM and UPM about the following variables using convenience sampling method. Independent variables are Perceived Usefulness, Perceived Ease of Use, Performance Risk, and Customer Attitude. Our analysis is based on the following model:

$$AEBit = \beta_0 + \beta_1PU + \beta_2EUit + \beta_3CAit + \epsilon_{it}$$

Where;

AEB refers to the average summated scale of Adoption of E-Banking services that was measured on a five point Likert scale adopted from [29].

PU refers to the average summated scale of Perceived Usefulness that was measured on a five point and 4 item Likert scale adopted from [29].

EU refers to the average summated scale of Perceived Ease of Use that was measured on a five point and 4 item Likert scale adopted from [29].

PR refers to the average summated scale of Perceived Risk that was measured on a five point and 5 item Likert scale adopted from [30].

CA refers to the average summated scale of Customer Attitude that was measured on a five point and 4 item Likert scale adopted from [29].

All Likert scales are composed of with end points of “strongly agree” and “strongly disagree”.

4. Analysis and Findings

This section presents the data analysis of this study. It includes the descriptive analysis as well as the hypotheses testing.

4.1 Descriptive Statistics

After testing for normality, we detected 9 outliers in the dataset and at the end 107 useful responses remained. As seen from the table 1 below, a test of normality using skewness and kurtosis revealed that 3 out of 4 independent variables are normally distributed since absolute values of all z values are less than significant values ($z < 1.96$). Only perceived usefulness is not normally distributed. With caution, we proceeded to further analysis considering that our variables are normally distributed and qualified for further multiple linear regression analysis.

Table 1: Descriptive Information and Normality

Variable	N	Mean	Std. Dev.	Skewness	Kurtosis
PU	107	4.493	.4862	-1.111	-1.046
Ease	107	4.035	.6214	-1.374	-.374
Risk	107	3.458	.6977	-.582	-1.048
Attitude	107	4.329	.4446	-.095	-1.132
E-Banking	107	3.948	.4745	1.493	-.020
Valid N (listwise)	107				

As seen from table 2, highest correlation with E-Banking is seen in Ease of Use ($r=.51$) and therefore we entered E-Banking as the independent variable as block 1. Despite a higher correlation with the dependent variable, perceived usefulness has significant correlation with two other variables, therefore we selected Customer Attitude as the independent variable as block 2. Then perceived usefulness and risk has been entered into our regression model as block 3.

Table 2: R-square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.515 ^a	.265	.258	.4087
2	.539 ^b	.290	.276	.4036
3	.543 ^c	.295	.267	.4063

- a. Predictors: (Constant), Ease
- b. Predictors: (Constant), Ease, Attitude
- c. Predictors: (Constant), Ease, Attitude, Risk, PU
- d. Dependent Variable: E-Banking

As seen from the summary of our regression model, goodness of fit is at the maximum when Ease of Use and Customer Attitude are included in the regression model ($R \text{ squared} = 0.276$). In other words, when Perceived Risk and Perceived Usefulness are included in our , goodness of fit tends to decrease, which reveals that it is not sensible to include these variables into our model. The analysis of variance is given in Table 3.

Table 3. Analysis of Variance

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression Residual Total	6.330 17.537 23.867	1 105 106	6.330 .167	37.899 	.000 ^b
2	Regression Residual Total	6.925 16.942 23.867	2 104 106	3.462 .163	21.253 	.000 ^c
3	Regression Residual Total	7.033 16.834 23.867	4 102 106	1.758 .165	10.653 	.000 ^d

- a. Dependent Variable: E-Banking
- b. Predictors: (Constant), Ease
- c. Predictors: (Constant), Ease, Attitude
- d. Predictors: (Constant), Ease, Attitude, Risk, PU

To detect if any multicollinearity threats our results, we checked for the collinearity diagnostics. The results showed that there was no evidence of multicollinearity. In particular, the variance inflation factor (VIF), which indicates the degree to which each predictor variable is explained by other predictor variables, is a common measure of multicollinearity in regression analysis [31]. A threshold VIF that is less than or equal to 10 (i.e., tolerance >0.1) is commonly suggested [31]. The VIFs for Ease of Use and Customer Attitude were 1.349 in predicting adoption of E-Banking, providing further evidence against multicollinearity. The result of the regression analysis is shown in Table 4.

Table 4: Result of Hypotheses Testing

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.361	.261		9.054	.000
	Ease	.393	.064	.515	6.156	.000
2	(Constant)	1.801	.390		4.616	.000
	Ease	.322	.073	.422	4.396	.000
	Attitude	.196	.102	.183	1.911	.059
3	(Constant)	1.584	.492		3.222	.002
	Ease	.298	.081	.391	3.664	.000
	Attitude	.168	.116	.157	1.442	.152
	PU	.076	.114	.078	.666	.507
	Risk	.027	.057	.039	.466	.642

5. Discussions and Implications

This study employed the hierarchical regression model to test the impact of perceived usefulness, customer attitude, ease of use and perceived risk on the adoption of E-Banking in Malaysia. An analysis of the data revealed that Ease of Use and Customer Attitude are significantly related to the adoption of E-Banking, which gives a support for our third and fourth hypothesis, which account for 29% of the variation in the dependent variable (Adoption of E-Banking). In contrast perceived usefulness and risk have no significant association between the dependent variables, therefore findings do not support our first and second hypothesis.

The results of this study-shed light on some important issues related to Adoption of E banking that have not been addressed by previous studies. First, although both Ease of use and customer attitude have a significant influence Adoption of E banking, this study reveals that the latter is a more influential factor, implying that controlling the Ease of use has more impact than customer attitude on Adoption of E banking. Our finding is particularly important for bank managers as they decide how to allocate resources to retain and expand their current customer satisfaction. In particular, managers should focus more on easier to use online banking systems and manage customers attitudes more effectively rather less time and resources should be devoted to other two factors. Our findings suggest that in developing E-Banking systems managers

are advised to search for more user-friendly systems. This study suggests that they should consider focusing on the customer attitude management. It is worth noting that because online banking is sometimes difficult to use for some segments of the society. Thus, we suggest that online banking companies should provide customers with easier to use E-banking services.

In terms of theory building, this study attempts to develop a new theory by grounding new variables in an integration of two schools of the nomological structure model (TRA) and applying them into a new context. It is important to note that customer attitude, as a new variable, is compatible with the TAM and TPB variables that have already been placed within the TRA framework (Davis, 1989). This approach is likely to ensure a stable theory development. Hence, the proposed model makes an important contribution to the emerging literature on e-commerce, especially with regard to online banking.

The present study has many implications for future online banking research. First, the empirical results show that the Ease of Use and Customer Attitude have significant effects on Adoption of E-online where perceived risk has no significant impact. This result indicates that the risk factor does not exert a stronger effect on customers' decision making for online banking.

6. Conclusion, Limitations and future research

This paper aims to develop an extended a model to predict and explain customers' behavioural intentions with regard to adopting online banking. The proposed model incorporates four variables to provide a more comprehensive investigation about online banking. The results show that the proposed model has moderate explanatory power, which requires that some other variables might affect the relationship.

As with any research, care should be taken when generalizing the results of this study. First, the survey was conducted using web based a non-random convenience sample. Gathering a larger sample using an alternate random sampling method would be costly. However, generalizability could be enhanced if future research is systematically sampled from a more dispersed sample.

Besides, the conclusions drawn from our study are based on cross-sectional data. With our cross-sectional data, we only took a snapshot of this model. A stricter test of our argument, however, could be employed by using a longitudinal study to evaluate this aspect. By using a longitudinal study in the future, we could investigate our research model in different time periods and make comparisons, thus providing more insight into the phenomenon of online banking adoption.

References

- [1] O. B. Al-Gharaibah, "Customer Retention in Five-Star Hotels in Jordan: The Mediating Role of Hotel Perceived Value," *Manag. Sci. Lett.*, vol. 10, pp. 1–15, 2020.
- [2] B. Eneizan, A. Alsaad, H. N. Abdelbaset Alkhalwaldeh, And O. E. Rawash, "E-wom, trust, usefulness, ease of use, and online shopping via websites: the moderating role of online shopping experience," *J. Theor. Appl. Inf. Technol.*, vol. 98, no. 13, 2020.
- [3] A. A. A. H. Al-Dalaïen, S. M. Drus, and H. Kasim, "A conceptual model of motivational factors of knowledge transfer for hospitals," *Int. J. Eng. Adv. Technol.*, vol. 9, no. 1, pp. 2313–2319, 2019.
- [4] A. A. A. H. Al-Dalaïen, S. M. Drus, H. Kasim, and A. T. Al-Oqaily, "Investigate the extrinsic and intrinsic motivational factors of knowledge transfer in the hospitals," *J. Comput. Sci.*, vol. 16, no. 1, pp. 92–104, 2020.
- [5] S. Alaaraj, Z. A. Mohamed, and U. S. Ahmad Bustamam, "External Growth Strategies and Organizational Performance in Emerging Markets: The Mediating Role of Inter-Organizational Trust," *Rev. Int. Bus. Strateg.*, vol. 28, no. 2, pp. 206–222, 2018.
- [6] S. Alaaraj, "Knowledge Management Capability , Trust , and Performance of Manufacturing Companies in Emerging Economies," *Int. J. Manag. Appl. Sci.*, vol. 4, no. 8, pp. 45–53, 2018.
- [7] S. Alaaraj, "Knowledge Management Capability, Trust, and Performance of Manufacturing Companies in Emerging Economies," in *Proceedings of 177 th The IIER International Conference*, 2018, pp. 1–9.
- [8] Y. T. M. Hamakhan, "The effect of individual factors on user behaviour and the moderating role of trust: an empirical investigation of consumers' acceptance of electronic banking in the Kurdistan Region of Iraq," *Financ. Innov.*, vol. 6, no. 1, pp. 1–29, 2020.
- [9] Y. T. M. Hamakhan, "An Empirical Investigation of E-Banking in the Kurdistan Region of Iraq: The Moderating Effect of Attitude," *e-Finanse*, vol. 16, no. 1, pp. 45–66, 2020.
- [10] Y. H. Khan, "A Short Review of the Electronic Banking System," *Reg. Bus. Stud.*, vol. 10, no. 1, pp. 13–37, 2018.
- [11] Y. M. Hama Khan, "AN ESSENTIAL REVIEW OF INTERNET BANKING SERVICES IN DEVELOPING COUNTRIES.," *Financ. Internet Quarterly'e-Finanse'*, vol. 15, no. 2, 2019.
- [12] M. H. Kayali, N. Safie, and M. Mukhtar, "Literature Review of Cloud Based E-learning Adoption by Students: State of the Art and Direction for Future Work," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 160, no. 2016, pp. 1–8,

- 2016.
- [13] M. H. Kayali, N. Safie, and M. Mukhtar, "Adoption of Cloud Based E-Learning: A Systematic Literature Review of Adoption Factors and Theories," *J. Eng. Appl. Sci.*, vol. 11, no. 8, pp. 1839–1845, 2016.
- [14] S. Alaarj, Z. Abidin-Mohamed, and U. S. B. A. Bustamam, "Mediating Role of Trust on the Effects of Knowledge Management Capabilities on Organizational Performance," *Procedia - Soc. Behav. Sci.*, 2016.
- [15] A. H. A. Zaid, N. Azman, and N. Azizan, "Success Factors Consideration for E-banking Web site from User Perspectives in Malaysia: A Study Using the Knowledge Transfer Process Model," *J. Glob. Sci. Res. (ISSN 2523-9376)*, vol. 1, pp. 295–306, 2020.
- [16] Z. Rehman, S. Omar, S. Zabri, and S. Lohana, "Mobile Banking Adoption and its Determinants in Malaysia," *Int. J. Innov. Technol. Explor. Eng.*, vol. 9, no. 1, pp. 4231–4239, 2019.
- [17] A. S. Jameel, *Factors affecting E-Commerce by E-learning*. LAP LAMBERT Academic Publishing, 2017.
- [18] A. Jameel and M. A.-A. Ahmad, "Determine some factors that affect to adoption of e-commerce among small and medium enterprises in Erbil," *Polytech. J.*, vol. 8, no. 1, 2018.
- [19] O. B. H. Al-Graibah and Z. A. A. Rawshdesh, "Factors Influencing Service Recovery," in *International Conference On Postgraduate Research*, 2017, no. January.
- [20] O. Al-gharaibah, "Brand Equity and Loyalty in the Airline Industry : The Role of Perceived Value and Online Word of Mouth," *Int. J. Innov. Creat. Chang.*, vol. 14, no. 9, 2020.
- [21] S. I. Auwal, S. I. Faisal, I. M. Yusuf, H. Altun, M. Kaiiali, and A. S. Wazan, "Cloud-based online social network," in *2013 International Conference on Electronics, Computer and Computation (ICECCO)*, 2013, pp. 289–292.
- [22] M. Kaiiali, A. Iliyasu, A. S. Wazan, A. Habbal, and Y. I. Muhammad, "A Cloud-based Architecture for Mitigating Privacy Issues in Online Social Networks," *Int. Arab J. Inf. Technol.*, 2019.
- [23] Venkatesh, Morris, Davis, and Davis, "User Acceptance of Information Technology: Toward a Unified View," *MIS Q.*, 2003.
- [24] M. Mattila, H. Karjaluoto, and T. Pentto, "Internet banking adoption among mature customers: early majority or laggards?," *J. Serv. Mark.*, 2003.
- [25] S. T. Akinyele and K. Olorunleke, "Technology and service quality in the banking industry: An empirical study of various factors in electronic banking services," *Int. Bus. Manag.*, vol. 4, no. 4, pp. 209–221, 2010.
- [26] F. D. Davis, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *Source MIS Q.*, vol. 13, no. 3, pp. 319–340, 1989.
- [27] M. Kayali and S. Alaaraj, "Adoption of Cloud Based E-learning in Developing Countries : A Combination A of DOI , TAM and UTAUT," *Int. J. Contemp. Manag. Inf. Technol.*, vol. 1, no. 1, pp. 1–7, 2020.
- [28] M. A. A. Al-Zaqeba and M. T. Al-Rashdan, "Extension of the TPB in tax compliance behavior: The role of moral intensity and customs tax," *Int. J. Sci. Technol. Res.*, vol. 9, no. 4, pp. 227–232, 2020.
- [29] T. C. E. Cheng, D. Y. C. Lam, and A. C. L. Yeung, "Adoption of internet banking: an empirical study in Hong Kong," *Decis. Support Syst.*, vol. 42, no. 3, pp. 1558–1572, 2006.
- [30] M. S. Featherman and P. A. Pavlou, "Predicting e-services adoption: a perceived risk facets perspective," *Int. J. Hum. Comput. Stud.*, vol. 59, no. 4, pp. 451–474, 2003.
- [31] Hair, T. M. Hult, C. M. Ringle, and M. Sarstedt, *A primer on partial least squares structural equation modeling*, 2nd ed. Thousand Oakes, 2017.

Questionnaire

Perceived usefulness

Using E-banking system improves my performance of banking activities.
Using E-banking system enables me to accomplish banking activities more quickly
Using E-banking system would increase the quality of banking transactions
Overall, I find E-banking system useful for my banking activities

Perceived ease of use:

It is easy to use E-banking system
Interaction with E-banking does not require a lot of mental effort.
Interaction with E-banking is clear and understandable.
Overall, E-banking system is flexible to interact with.

Performance risk

E-banking system may not perform well because E-banking servers are being down or in maintenance
I fear to make mistakes while using E-banking system (e.g. wrong transferring process).
I would not feel totally safe providing personal privacy information over the Internet Banking.
I would have to waste a lot of time fixing payments errors, while using E-banking servers
when my electronic account incurs fraud or being hacked, I will have potential to lose of status in the society

Customer Attitude

I think using E-banking is a good and effective idea.

I think these days; using E-banking for financial transactions is a necessity.

Conducting E-banking is interesting and exciting for me.

Overall, I am willing to use E-banking system.

Adoption E-banking services

I would use other online banking services for my banking needs.

Using the online banking for handling my banking transactions is something I would continue to do.

I see myself using other online banking services for handling my banking transactions for many years to come.

I intend to consult the bank personal about additional platform of Internet banking.

I intend to learn attractive transferring tools (e.g. telephone, mobile phone) for my banking needs.