The Role of Perceived Trust of Physical Bank towards Perceived Risk on Internet Banking Acceptance from the User Perspective

Iwan Inrawan Wiratmadja, Natasya Dameria, and Amelia Kurniawati

***Abstract*—In internet things era, there has been a change in banking delivery channel towards online banking. Besides providing the ease for their customer to perform banking activity in anytime and anywhere using internet network, the cost of online banking development is considered much cheaper than the cost to set up new office branch or new ATM service. Although internet banking provides many benefits and eases for banking customer, many customers have not utilized internet banking to its potential usage. Many banking customers refuse to use online banking service due to the risk perceived by the customer in performing an online transaction using internet banking. Based on the previous study, overcome risk issue in internet banking, bank sector should win customer's trust. Thus, trustworthiness is considered a critical factor for the success of e-business including internet banking. Most of the studies related user's acceptance are conducted using TAM model, but still few studies that integrate perceive risk, TAM, and trust. This study aims to increase the understanding towards the factors that drive the customer to refuse the usage of internet banking, the factors which drive the customer to accept internet banking usage, and the role of those factor towards customer's behavioral intention in using internet banking service. An empirical study was conducted using 242 sample data of internet banking customer in Indonesia. The result of this study shows that trust has a negative effect towards risk and security risk has a non-significant effect towards attitude towards using and behavioral intention.**

***Index Terms*—Internet banking, perceived risk, TAM, trust.**

I. Introduction

Recently, there has been a change in banking delivery channel towards online banking service such as internet banking [1]. Beside provide the ease for their customer to perform banking activity in anytime and anywhere using internet network, the cost of online banking development is considered much cheaper than the cost to set up new office branch or new ATM service [2]. Internet banking is defined as internet based service which provided by the bank through a particular internet portal, through which customer can use different kinds of banking service such as bill payment, making investments, obtain account information, etc. [1]. Although internet banking provides many benefits and eases for banking customer, many customers have not utilized internet banking to its potential usage. Based on data obtained from one of the largest banks in Indonesia, from over 3 million banking customer, less than half million customers using internet banking to perform an online transaction. Durkin and O'Donnell [3] found that even though internet banking is considered as innovative technology, many customers showed no interest in using internet banking to replace face-to-face interaction in the bank. Moreover, Robinson [4] found that half of the people that have tried online banking service will not become an active user. Therefore, it indicates that internet banking acceptance is faced with problems.

A lot of attentions have been given towards factors that can drive customer's acceptance towards internet banking, but to obtain comprehensive explanation towards banking customer acceptance of internet banking, both drivers and barriers in banking customer's acceptance of internet banking must be considered. Technology Acceptance Model (TAM) [5] has been widely used to explain user's acceptance towards particular technology through construct perceive ease of use and perceive usefulness that will positively affect user's attitude and behavioral intention towards a particular technology. In this study, TAM concept through perceived ease of use and perceived usefulness will be used as driver construct that will lead to internet banking acceptance.

One of the barriers faced by the bank in encouraging the usage of internet banking is constrained by banking customer resistance to use online banking due to the risk perceived by the customer in performing online transaction using internet banking [6]. Banking customer tends to assume that there is uncertainty in performing online transaction in terms of security, functional defect, etc. [1], [7]. Banking customer tends to refuse in giving sensitive information in using internet banking due to lack of trust to internet banking security [7]. Lee [6] stated that to overcome the issues above, internet banking sector should win customer's trust. The statement is supported by Chiou and Shen [8] that stated that trustworthiness is a critical factor for the success of e-business including internet banking where trust in the bank as a whole can affect customer's trust in online banking. Customer's trust is needed to minimize the risk of internet banking usage perceived by customers.

Although many studies related to online banking acceptance has been developed, but few studies integrates trust and risk aspect together as a factor that affects customer's intention in using internet banking. In this study, TAM concept and perceived risk are combined and the role of trust in minimizing perceived risk is also examined. This

Manuscript received December 25, 2016; revised April 26, 2017.

Iwan Inrawan,Wiratmadja and Natasya Dameria are with the Industrial Engineering Department, Bandung Institute of Technology, Bandung, Indonesia (e-mail: iwan@ lspitb.org, natasyadameriamanalu@gmail.com).

Amelia Kurniawati is with Industrial Engineering Department, Telkom University, Bandung, Indonesia (e-mail: ameliakurniawati@telkomuniversity.ac.id).

doi: 10.18178/joebm.2017.5.4.506

study aim to increase the understanding towards factor that drive customer to refuse the usage of internet banking, factor that drive customer to accept internet banking usage, and the role of those factor towards customer's behavioral intention in using internet banking service for their banking transaction by considering trust and perceived risk of internet banking from customer's point of view.

II. Research Model

Fig. 1. present the research model developed in this study. The model is developed by using constructs from two concepts i.e. Technology Acceptance Model (TAM) and perceived risk from Chiou and Chen [7]. Thus, the role of those constructs towards attitude using and behavioral intention to use internet banking is examined.

A. Perceived Risk

Perceived risk is defined as customer's perception of the uncertainty and consequences of using particular product or service [9]. In reference [6], perceived risk consists of five dimensions such as security/privacy risk, financial risk, time risk, social risk, and performance risk. Based on the previous study, security risk and financial risk is considered to have the biggest effect towards internet banking acceptance. Therefore, security risk and financial risk are considered as constructs in this model. Security/privacy risk is defined as potential loss due to fraud or hacker towards internet banking system and while financial risk is defined as the possibility of monetary loss due to transaction error or bank account misuse illegally [6]. Lee [6] stated that to overcome the issues above, internet banking sector should win customer's trust. The statement is supported by [7] that stated that trustworthiness is a critical factor for the success of e-business including internet banking. Moreover, trust in the bank as a whole can affect customer's trust in online banking [7]. The fact that a bank is seen as trustworthy may alleviate customer's concern related perceived risk in using online banking [7]. Therefore, here are the hypotheses:

H1. Perceived trust of physical banking is negatively related to security risk in internet banking acceptance.

H2. Perceived trust of physical banking is negatively related to financial risk in internet banking acceptance.

Trying new particular product/service/technology involve some risks and may cause customer delay or cancel the usage of the new product, in this study refer to internet banking [9]. Perceived risk is considered as the main barrier to online transaction [10]. Perceived risk is found negatively influence online transaction customer where the higher the perceived risk the more likely customer to have lower intention in using particular product/service [11], [12]. Thus the hypotheses are:

H3. Security Risk is negatively related to attitude toward using in internet banking acceptance.

H4. Financial risk is negatively related to attitude toward using in internet banking acceptance.

H5. Security Risk is negatively related to behavioral intention in internet banking acceptance.

H6. Financial risk is negatively related to behavioral intention in internet banking acceptance.

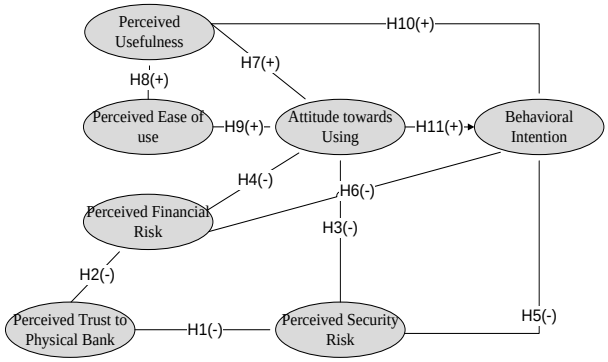

Fig. 1. Proposed research model.

B. Technology Acceptance Model

Technology Acceptance Model has been widely used to explain user's acceptance towards particular technology [7]. In this study, the four TAM common constructs such as perceived ease of use, perceived usefulness, attitude towards using, and behavioral intention are used to explain customer's acceptance towards internet banking. Perceived ease of use is defined as the degree which customer is believed that the use of technology would be free of effort [1], [5], [6]. Perceived usefulness is defined as the degree to which a customer believe that the using of particular technology would improve their performance [1], [6]. Based on TAM, there was a relationship between perceived ease of use and perceived usefulness. The relationship indicates that when customer perceived that particular technology is easy to use, he/she will have the ability to utilize the technology to its potential benefit perceived that the usage of the technology can improve their performance. Based on the argument above, therefore the hypotheses are:

H7. Perceived ease of use is positively related to perceived usefulness in internet banking acceptance.

TAM posits that perceived ease of use and perceived usefulness is a significant factor affecting acceptance of technology adoption [1] and both factors has been used extensively in information system and technology research and has strong empirical support as an important predictor of technology adoption [13]. Based on arguments above, it is indicated that when internet banking is perceived to be easy to use and usefulness by customer, internet banking is more likely to be accepted by banking customer. Therefore, the hypotheses are:

H8. Perceived usefulness is positively related to attitude toward using in internet banking acceptance.

H9. Perceived ease of use is positively related to attitude toward using in internet banking acceptance.

H10. Perceived usefulness is positively related to behavioral intention internet banking acceptance.

H11. Attitude toward using is positively related to behavioral intention internet banking acceptance.

III. Methodology

A. Measurement Development

Based on the literature study, 28 items were used to assess internet banking behavior. Measurement item used in this study were adapted from the previous study related to this study. Moreover, a seven–point Likert scale ranging from 1

(strongly disagree) to 7 (strongly agree) were used to assess respondent's response. A pilot test of the measurement items was conducted using 40 samples data of internet banking user who has experience in using internet banking for online transaction. The result of the pilot test indicates that all statements can be used in final data collection

B. Data Collection

Data was collected using purposive sampling method because only internet banking user who has utilized internet banking for their online transaction e.g. online shopping was chosen as the respondent. There were 374 of 400 responses that can be processed in further step. Table I presents the respondents' characteristics.

IV. Result

Use Structural Equation Model (SEM) is used to test and analyze the research model. SEM model evaluations were done by evaluating measurement and structural model. Measurement model evaluation was done to test how well how well the measured variables represent their construct while structural model evaluation was done to examine two issues: (1) overall and relative model fit as a measure of acceptance of the proposed model and (2) structural parameter estimate [14].

TABLE I: Respondent's Characteristic

	Measure	Frequency	Percentage
Gender	Male	74	31
	Female	168	69
Education	High school	15	6
	Bachelor Degree	182	75
	Master Degree	42	18
	Doctor	3	1
Salary /month (Million)	< 2	31	13
	2-4	48	20
	4-6	36	15
	6-8	43	18
	>8	84	34
Job	Student	45	19
	Employee	120	49
	Entrepreneur	36	15
	Unemployed	41	17

*H*9 (β= 0.56; *t*-value= 5.12; *p*-value= 0.000), *H*10 (γ= 0.30; *t*-value= 2.07; *p*-value= 0.0411), and *H*11 (γ= 0.60; *t*-value= 5.75; *p*-value= 0.000).

A. Measurement Model Evaluation

Measurement model evaluation was done by conducting confirmatory factor analysis by evaluation loading factor, composite reliability (CR), and average variance extracted (AVE). The results of measurement model evaluation can be seen in Table II and had fulfilled the convergent validity criteria by using the rule of thumb for loading factor is at least 0.5, CR > 0.7 and AVE > 0.5 [14], [15].

B. Structural Model Evaluation

Fig. 2 and Table III show the result of structural model evaluation. With the exception of H3 (γ= 0.01; *t*-value= 0.14; *p*-value= 0.8885) and H5 (γ= 0.12; *t*-value= 1.81; *p*-value= 0.0734), all other hypothesized relationships are supported. H1 (β= -0.45; *t*-value= -4.8; *p*-value= 0.000, H2 (β= -0.58; *t*-value= -6.59; *p*-value= 0.000), H4 (γ= -0.15; *t*-value= -2.62; *p*-value= 0.0102) H6 (γ= -0.19; *t*-value= -2.73; *p*-value= 0.0071), H7 (β= 0.81; *t*-value=11.36; *p*-value=0.000), H8 (γ=0.22; *t*-value= 2.38; *p*-value=0.0139),

V. Discussion and Implication

The results of this study indicate that most of the hypotheses built in this study are accepted. Consistent with the hypotheses, Perceived Trust of Physical Banking has negative relationship towards security risk and financial risk. As Gurhan-Canli and Barta [16] stated that customer's trust towards particular organization will affect the risk perceived by customers in using particular service/product. Moreover, the found of this study is supported by Kuisma [17] that stated that one of the main barriers in adopting internet banking is financial loss potential. Based on [8], trust is considered as the most effective aspect to reduce uncertainty in internet banking. In banking sector that has equipped with online banking service, trust is needed to get over customer's financial risk in using internet banking. Moreover, perceive ease of use is found to have positive relationship towards perceived usefulness. This found is supported by the study from Chiou and Shen [7] that found that perceive ease of use has a strong positive relationship towards perceive usefulness and will lead to greater acceptance of online banking service [1], [18].

Consistent with the hypotheses, financial risk, perceived ease of use, and perceived usefulness has significant effect towards attitude towards using. This found is aligned with a study from Chiou and Shen [7] that indicate that the greater financial risk perceived by the customer, will lead to lower good attitude towards using internet banking. There are worries perceived by customers that other party can access customer's personal and financial information illegally [19]. Moreover, as stated in Chiou and Shen [7], higher perceive ease of use and perceived usefulness will lead to higher good attitude towards using internet banking.

TABLE II: Measurement Model Evaluation

Variable	CR	AVE
Perceived Trust of Physical Banking	0.74	0.35
Security Risk	0.68	0.33
Financial Risk	0.75	0.36
Perceived Usefulness	0.77	0.43
Perceived Ease of Use	0.76	0.38
Attitude towards Using	0.80	0.39
Behavioral Intention	0.68	0.34

Consistent with the hypotheses, financial risk, perceived ease of use, and perceived usefulness has significant effect towards attitude towards using. This found is aligned with a

study from Chiou and Shen [7] that indicate that the greater financial risk perceived by the customer, will lead to lower good attitude towards using internet banking. There are worries perceived by customers that other party can access customer's personal and financial information illegally [19]. Moreover, as stated in Chiou and Shen [7], higher perceive ease of use and perceived usefulness will lead to higher good attitude towards using internet banking. This study also found that security risk has no significant effect towards attitude towards using internet banking that indicates that customer still has a good attitude towards using online banking even though there is a risk that internet banking network being hacked. Consistent with hypotheses, this study found that financial risk and perceived usefulness have significant relationship towards behavioral intention while security risk doesn't. This result is supported by the statement of Yousafzai, Pallister, and Foxall [20] that stated that customers will still have the behavioral intention and take the risk of internet banking usage when they trust the internet banking service provider.

Finally, this study also proved that attitude towards using online banking has positive relationship towards behavioral intention to use internet banking. This found is supported by studies from [7], [13] that show a similar result. Attitude towards using construct is found to mediate the effect of perceived usefulness and perceived ease of use towards behavioral intention.

TABLE III: RESULT OF HYPOTHESES TESTING

Hypotheses	Estimate	T-Value	P-Value	Result
*H*1	-0.45	-4.8	0.000	Supported
*H*2	-0.58	-6.59	0.000	Supported
*H*3	0.01	0.14	0.8885	Reject
*H*4	-0.15	-2.62	0.0102	Supported
*H*5	0.12	1.81	0.0734	Reject
*H*6	-0.19	-2.73	0.0071	Supported
*H*7	0.81	11.36	0.000	Supported
*H*8	0.22	2.38	0.0193	Supported
*H*9	0.56	5.12	0.000	Supported
*H*10	0.30	2.07	0.0411	Supported
*H*11	0.60	5.75	0.000	Supported

Based on the result of this study, it is suggested the internet banking management to improve their system security to prevent fraud or misuse of customer personal and financial information. Moreover, internet banking management should ensure that customers wouldn't suffer financial losses due to the use of internet banking or when there are financial losses, management should take full responsibility. Besides that, internet banking should be design as user-friendly as possible and easy to use. Internet banking management should provide detail information about step by step in using internet banking.

This study has several limitations. First, this study only explains two factors of perceived risk that are security risk and financial risk. It is recommended for further research to consider another factor that hasn't been considered in this study. Second, the data in this study were obtained from internet banking user only. It would be better to obtain data from all bank customers who use internet banking and who don't use internet banking.

VI. CONCLUSION

There are some constructs that directly affect user's behavioral intention in using internet banking such as financial risk, perceived usefulness and attitude toward using internet banking. To increase user's intention in using internet banking, bank management should minimize the financial risk that is perceived by banking customer. Bank management should ensure that customer will not suffer financial loss from the using of internet banking. Moreover, user's intention in using internet banking also can be achieved by design internet banking interface that user-friendly and provide guidelines for the new user in using internet banking. Moreover, minimizing perceived risk also can be achieved by increasing customer trust towards physical bank through building great and positive corporate image.

REFERENCES

[1] T. Pikkarainen, K. Pikkarainen, H. Kartajaluoto, and S. Pahnila, "Consumer acceptance of online banking: an extension of the technology acceptance model," *Internet Research,* vol. 14, no. 3, pp. 224-235, 2004.

[2] M. Purwanegara, "Snapshot on indonesia regulation in mobile Internet banking users attitude," *Procedia-Social and Behavioral Science,* vol. 115, pp. 147-155, 2013.

[3] M. Durkin and A. O'Donnell, "Toward model of adoption in internet banking: strategic communication challenges," *The Service Industries Journal,* vol. 25, no. 7, pp. 861-878, 2005.

[4] T. Robinson, "Internet banking: Still not a perfect marriage," Informationweek.com, 2000.

[5] F. D. Davis, "Perceived usefulness, perceived ease of use and user acceptance of information technology," *MIS Quarterly,* vol. 13, pp. 319-340, 1996.

[6] M. C. Lee, "Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit," *Electronic Commerce Research and Application,* vol. 8, no. 3, pp. 130-141, 2009.

[7] J.-S. Chiou and C.-C. Shen, "The antecedents of online financial service adoption: the impact of physical banking service on internet banking acceptance," *Behaviour and Information Technology,* vol. 31, no. 9, pp. 859-871, 2012.

[8] B. Suh and I. Han, "Effect of trust on customer acceptance of internet banking," *Electronic Commerce and Application,* vol. 1, pp. 247-263, 2003.

[9] H. Yang, Y. Jieun, H. Zo, and C. Munkee, "User acceptance of wearable devices: An extended perspective of perceived value," *Telematic and Informatics,* vol. 33, pp. 256-269, 2016.

[10] Y. Liebermann and S. Stashevsky, "Perceived risks as barriers to internet and e-commerce usage," *Qualitative Market Research,* vol. 5, no. 4, pp. 291-300, 2002.

[11] G. R. Dowling and R. Staellin, "A model of perceived risk and intended risk-handling activity," *Journal of Consumer Research,* vol. 21, no. 1, pp. 119-134, 1994.

[12] S. M. Forsythe and B. Shi, "Consumer patronage and risk perceptions in internet banking," *Journal in Business Research,* vol. 40, no. 4, pp. 447-470, 2003.

[13] T. Cheng, D. Y. Lam and A. L. Yeung, "Adoption of internet banking: an empirical study in hong kong," *Decision support system,* vol. 42, no. 3, pp. 1558-1572, 2006.

[14] J. Hair, W. Black, B. Babin and R. Anderson, *Multivariate Data Analysis: A global Perspective*, Prentice Hall, 2009.

[15] C. Fornell and D. F. Larcker, "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research,* vol. 18, no. 1, pp. 39-50, 1981.

[16] Z. Gurnan-Canli and R. Batra, "When Corporating Image Affects Product Valuations: The moderating role of perceived risk,"*Journal of Marketing Research*, vol. 41, no. 2, pp. 197-205, 2004.
[17] T. Kuisma, T. Laukkanen, and M. Hiltunen, "Mapping the reason for resistance to internet banking," *International Journal Information Management*, vol. 27, no. 2, pp. 75-85, 2007.
[18] W. Chan and M. Lu, "Understanding internet banking adoption and use behavior: A Hongkong perspective," *Decision Support System*, vol. 12, pp. 21-43, 2000.
[19] D. Littler and D. Melanthiou, "Consumer perception of risk and uncertainty and the implication for behavior towards innovative retail service: the case of internet banking," *Journal of Retailing and Consumer Service*, vol. 3, pp. 341-443, 2006.
[20] S. Yousafzai, J. Pallister, and G. Foxall, "Multidimensional role of trust in internet banking adoption," *The Service Industries Journal*, vol. 29, no. 5, pp. 591-605, 2009.

Iwan Inrawan Wiratmadja is an associate professor at Department of Industrial Engineering, Bandung Institute of Technology in Bandung, Indonesia. He received his doctoral degree from Ecole Superieure des Affaire-University Pierre Mendes France, Grenoble, in 1995, in management of technology field. His current research interest is in technology and knowledge management field.

Natasya Dameria was a master student in Bandung Insitute of Technology, Bandung, Indonesia. She majored in Industrial Engineering and Management and already graduated in 2016.

Amelia Kurniawati is a lecturer at Department of Industrial Engineering, Telkom University in Bandung, Indonesia. She received a master degree from Bandung Institute of Technology Indonesia in 2009. Her current research interest is in the area of knowledge management.