The Influence of Perceived Risk and Trust in Adoption of FinTech Services in Indonesia

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***Abstract*—The service level in community must be considered if it wants to continue to be used by the users. This research studies the adoption of Financial Technology (FinTech) services in the terms of trust and risk. The work employs the Technology Acceptance Model (TAM) theory as the theoretical basis combined with trust and perceived risk. The research method is quantitative. The data are analyzed by the Structural Equation Model (SEM) using Smart PLS V2.0. The researchers use a questionnaire in Google Form to collect the data. It is distributed online with the snowball data collection technique. As a result, 548 respondents are successfully gathered. The results indicate that the factor of users trusts influences perceived usefulness in the adoption to use FinTech services. However, the risk factor does not affect the use of FinTech services, which further does not influence the users' attitude. The work contributes to the study of the adoption of FinTech services, which provides a view determining the users' intention to use FinTech services in Indonesia.**

***Index Terms*—Trust, Perceived Risk, FinTech, TAM**

I. Introduction

INFORMATION technology is developing so rapidly that it affects all aspects of the business world. One of them is the innovative use of Internet to help companies to improve their business performance [1, 2]. Technology innovation in the world of finance has led to the incorporation of information and financial technology into Financial Technology (FinTech) [3–7]. FinTech is more dynamic than changes in financial services [5, 6, 8]. It provides the new views of financial services that become more efficient in payment schemes in a transaction [9]. It changes the traditional financial services to innovative services in the financial services industry in the form of FinTech [4, 8, 10]. Thus, it provides a broader range in the field of financial services, starting from products created to available services and markets. With its development, Fintech provides innovative payments that can revolutionize the attitude or way someone pays [8, 11].

FinTech dramatically influences the development of business industry. The use of FinTech is seen from changes in the process of financial transactions [7, 10]. In the business world, the application of FinTech will provide the ability to compete [12] because FinTech provides speed and flexibility [3, 13, 14]. In Indonesia, the development of FinTech appears on various parties who compete to provide these services. In Ref. [15], the companies that provided FinTech services included Telkomsel (t-cash), GoJek (Go-Pay), Bank BCA (Sakuku), and others. Thus, many companies that develop FinTech are encouraged to provide the best services to users.

The company must pay attention and understand the behavior and perceptions to increase the number of FinTech service users. Companies must provide trust and perceived risk factors to users [10, 16–19]. Thus, the researchers are interested in studying the relationship of these factors whether it can influence the interest in using FinTech services provided by the company or not. The researcher explores the relationships that occur between trust and perceived risk to users' behavior by using the Theory of Technology Acceptance Model (TAM) [20] as the basic theory of this research.

II. Theory and Hypothesis

Davis developed the TAM model for the first time to understand human behavior towards technology developed from the Theory of Reasoned Action (TRA) that described the perception of behavior or actions [20, 21]. Based on the developments, the TAM model can evaluate and identify elements that influence human behavior towards the use of a technology [22]. In this model, there are two main variables to understand the users' behavior, namely perceived usefulness and perceived ease of use. The perceived usefulness is a perception of the benefits of the use of technology.

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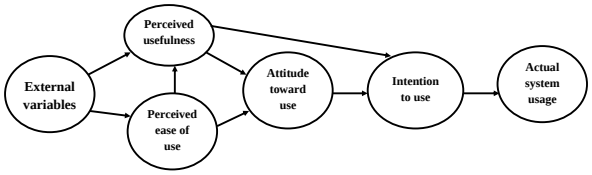

Fig. 1. Technology Acceptance Model (TAM) [20].

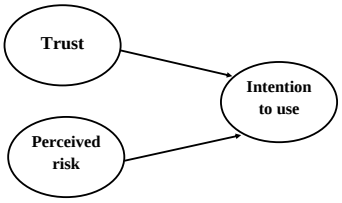

Fig. 2. Relationship trust, risk, and behavior intention to use (independent relationship).

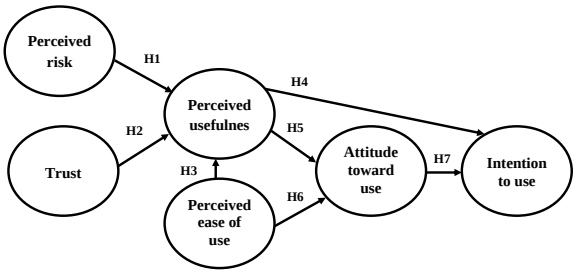

Fig. 3. Developed research model.

Meanwhile, the perceived ease of use is a perception of the ease in using the technology [23, 24]. In the previous research, these two variables have a significant effect in a decision to adopt a technology. In this study, the researchers add two variables that can influence users in adopting technology. Those are trust and perceived risk. It is because these two elements are considered essential in influencing human behavior. The model can be seen in Fig. 1.

1) Trust.
   Trust is an idea related to the self-confidence, hope, reliability, dependence, integrity, and capacity of an entity. The main problem for a user is a basis of trust in something. For example, it is the trust in using FinTech [25]. The necessary steps to increase users' confidence are the company establishes users' connections by communicating well [26, 27]. Another research illustrates that trust is an essential element that influences the adoption of FinTech services [9, 25–30].
2) Perceived Risk.
   Perceived risk has been investigated since 1960 to determine a relationship between human behavior [29]. A risk is an act of a person who produces a decision that gives hope and detrimental effect [31, 32]. The behavior of the user towards risk is described in a multidimensional way. The user believes the possible negative consequences of its use [29]. Risk plays an essential role in safety, finance, social, time [32–36].
3) Relationship between Trust, Perceived Risk, and Intention to Use.
   In the use of technology, trust and perceived risk have a relationship to provide an attraction to a user. However, these two factors are not interdependent. It can be seen in Fig. 2. It is with the relationship of trust and perceived risk to intention to use technology. So, in this research, the researchers build a model that can be seen in Fig. 3. The model consists of three independent variables and three dependent variables. The independent variables are perceived risk (PR), trust (T), and perceived ease of use (PE). Then, the dependent variables are attitude toward use (AT), perceived usefulness (PU), and intention to use (IU). Thus, the researchers construct the hypotheses as follows:
   - H1: PR positively influences PU in using the FinTech
   - H2: T positively influences PU in using the FinTech
   - H3: PE positively influences PU in using the FinTech
   - H4: PU positively influences IU in the FinTech
   - H5: PU positively influences AT in the FinTech
   - H6: PE positively influences AT in the FinTech
   - H7: AT positively influences IU in the FinTech

III. Research Method

This research is explanatory research using a quantitative approach. This research explores the relationship between variables. Also, this research is intended to test the hypotheses that have formulated previously. In the end, the results of this study explain the causal relationship between variables through hypothesis testing. In this study aims to determine the relationship of six variables.

A. Sample

The focus of this study is to explain users' behavior to continue using FinTech services. In this study, the

TABLE I
THE DEFINITION OF VARIABLES IN RESEARCH.

Variable	Definition	Ref
Perceived Usefulness (PU)	The trust of a person in using a particular system will improve performance.	[16, 23, 33, 34, 37]
Perceived Ease of Use (PE)	Consumers' confidence that the use of the FinTech service is easy and does not require much effort to learn	[16, 23, 33, 34, 37]
Attitude towards use (AT)	The level of consumer evaluations in the use of the FinTech service	[16, 23, 33, 34, 37]
Intention to use (IU)	Subjective assessment of the consumer about the possible willingness to use the FinTech services in the future	[16, 23, 33, 37]
Trust (TR)	The idea of belief, self-confidence, hope, integrity, dependence, reliability, the ability for an entity character of a thing.	[9, 25–28, 34]
Perceived Risk (PR)	The expectation that becomes a loss occuring when people decide to take an action	[31, 32, 34]

researchers use the purposive sampling method to find the respondents. The use of this technique aims to facilitate the selection of user characteristics by the research. The determination parameter used is users who have used or always use FinTech services. Data collection is done online by using Google Form.

B. Research Instrument

The development of instruments for this study is used to measure variables. The measurement of the variables in the model developed using the indicators of each variable. The variables used in the study can be seen in Table I. The indicators of this study are adopted from the previous study indicators. Each of them is built from studies that fit the variables. All indicators are measured using a five-point Likert scale starting from 1 = strongly disagree to 5 = strongly agree.

IV. RESULTS AND DISCUSSION

Data analysis in this study uses the Structural Equation Model (SEM) using Smart PLS V2.0. SEM can test the relationship between variables. There are two main steps to analyze the data. First, it is an evaluation known as the measurement model. This analysis is done to ensure the validity and reliability of a research instrument and to carry out a structural model analysis aiming to validate the research model. Second, there is hypothesis test.

A. Respondents

The respondents have used FinTech services in one or several industries in Indonesia. The process of data collection is carried out in March–December 2018. The survey results are from filling out the online questionnaire. The profile of respondents who participate in this study can be seen in Table II.

TABLE II
RESPONDENTS PROFILE.

Demographic characteristics	Number of Respondents	Percentage (%)
Gender		
Male	306	55.8
Female	242	44.2
Age		
15 - 20 year	183	33.4
21 - 25 year	125	22.8
26 - 30 year	48	8.8
31 - 35 year	112	20.4
36 - 40 year	80	14.6
Job		
Private Employees/ Civil Servants	242	44.2
Student	306	55.8

B. Evaluating the Instrument

The evaluation phase of the instrument is a standard stage that must be carried out in quantitative research. The phase is done by testing the validity and reliability of the instrument. In the evaluation, it is necessary to distribute the instruments to the respondents. The distribution is done through online surveys using Google Forms. It is distributed through social networks and Internet networks. The results are obtained from 756 respondents. However, after being selected, 548 respondents are found suitable to be used in the hypothesis test.

1) Reliability Test.
The reliability of an instrument is assessed by the composite reliability, Cronbach's alpha and Average Variance Extracted (AVE). According to Ref. [38], if the AVE value is > 0.5, AVE is stated to be a reliable instrument. The results show that the value of composite reliability is > 0.8, Cronbach's alpha is > 0.7, and AVE is > 0.5. Thus, the instrument can be said to be reliable. The results are shown in Table III. Thus, the instrument developed is reliable so it can use

TABLE III
RELIABILITY TESTS.

Variable	AVE	Composite Reliability	Cronbach's Alpha
AT	0.502	0.749	0.518
IU	0.565	0.886	0.845
PE	0.553	0.831	0.731
PR	0.539	0.852	0.781
PU	0.594	0.879	0.827
T	0.655	0.851	0.739

TABLE IV
OUTER LOADING.

	PE	PR	PU	T	AT	IU
AT1					0.779	
AT2					0.601	
AT3					0.733	
IU1						0.821
IU2						0.726
IU3						0.779
IU4						0.762
IU5						0.715
IU6						0.698
PE1	0.621					
PE2	0.810					
PE3	0.737					
PE4	0.793					
PR1		0.749				
PR2		0.857				
PR3		0.774				
PR4		0.613				
PR5		0.649				
PU1			0.854			
PU2			0.790			
PU3			0.829			
PU4			0.683			
PU5			0.681			
T1				0.853		
T2				0.773		
T3				0.801		

for the actual surveys.

2) Validity Test.
The process of testing instrument validity is by evaluating the variable validity. Validity test is used to identify and find out the strength of the indicators. This evaluation is carried out with two approaches, namely factor analysis and convergent validity. First, it is factor analysis. It can be used to simplify or to reduce the number of categories into several factors. The results by using the outer loading analysis are in Table IV. Second, it is convergent validity. It is done by showing the correlation and convergence of indicators towards variables. It is indicated by the indicator of a variable when it converges or is highly correlated with other indicators in the same variable theoretically. The results by using cross loading are in Table V.

TABLE V
CROSS LOADING.

	PE	PR	PU	T	AT	IU
AT1	0.627	0.360	0.595	0.577	0.779	0.642
AT2	0.326	0.176	0.323	0.259	0.601	0.376
AT3	0.511	0.580	0.411	0.337	0.733	0.662
IU1	0.711	0.625	0.605	0.547	0.714	0.821
IU2	0.562	0.577	0.531	0.398	0.612	0.726
IU3	0.522	0.477	0.509	0.385	0.655	0.779
IU4	0.565	0.366	0.527	0.434	0.567	0.762
IU5	0.477	0.365	0.397	0.373	0.540	0.715
IU6	0.572	0.465	0.433	0.399	0.571	0.698
PE1	0.621	0.477	0.474	0.471	0.287	0.457
PE2	0.810	0.533	0.685	0.627	0.551	0.618
PE3	0.737	0.292	0.561	0.462	0.645	0.550
PE4	0.793	0.505	0.677	0.540	0.579	0.622
PR1	0.428	0.749	0.407	0.373	0.475	0.505
PR2	0.492	0.857	0.481	0.416	0.481	0.484
PR3	0.468	0.774	0.422	0.352	0.399	0.460
PR4	0.307	0.613	0.315	0.353	0.306	0.425
PR5	0.481	0.649	0.399	0.458	0.350	0.503
PU1	0.713	0.502	0.854	0.654	0.575	0.595
PU2	0.604	0.324	0.790	0.520	0.420	0.441
PU3	0.739	0.513	0.829	0.629	0.583	0.586
PU4	0.531	0.420	0.683	0.568	0.454	0.458
PU5	0.511	0.354	0.681	0.412	0.420	0.485
T1	0.588	0.441	0.616	0.853	0.520	0.515
T2	0.476	0.404	0.491	0.773	0.423	0.438
T3	0.631	0.442	0.648	0.801	0.452	0.424

TABLE VI
RESEARCH VARIABLE.

Independent Variable	Dependent Variable
Perceived risk	Attitude toward use
Trust	Intention to use
Perceived ease of use	Perceived usefulness

C. Structural Model Evaluation

The structural model evaluation process is described in the conceptual research model. The evaluation process is an essential activity in this research. It can evaluate the value of coefficient determinant (R2), coefficient path, and effect size. The structural model evaluation is obtained from fit research variables in the model. The research variables are shown in Table VI.

The results of the evaluation of trust, perceived risk, perceived ease of use in perceived usefulness are 0.714. It can be affirmed simultaneously (jointly) that the effect is significant among the independent variables. The value of the perceived ease of use in R2 for attitude toward use is 0.523. Therefore, it is sufficiently classified. Although the R2 in the intention to use the variable is 0.703, this value is classified as useful. Thus, it can be concluded that three independent variables and two variables dependent can influence the intention to use. The result of the fit indicator can be seen in Table VII.

TABLE VII
MODEL FIT INDICATORS.

	Composite Reliability	R Square	Cronbach's Alpha	Commun-ality	Redund-ancy
AT	0.749	0.523	0.518	0.502	0.239
IU	0.886	0.703	0.845	0.565	0.360
PE	0.831	0.000	0.731	0.553	0,000
PR	0.852	0,000	0.781	0.539	0,000
PU	0.879	0.714	0.827	0.594	0.356
T	0.851	0,000	0.739	0.655	0,000

D. Hypothesis Test

The researchers develop the hypotheses through the previous research that discusses the adoption of technology. From the process, the researchers obtain seven hypotheses to describe the relationship between the six variables used in this study which can be seen in Fig. 3. The reseachers tests the hypotheses with the SmartPLS V2.0. The results are shown in Table VIII. After the testing process has been carried out, it can provide the results of a hypotheses in Table IX.

This study shows the factors that must be considered by FinTech services in the development so that it can be used by the users properly. The study has seven hypotheses in which five results support the hypotheses and two results do not.

The results of H1 show the insignificant relationship between perceived usefulness and perceived risk. It implies that the usefulness of FinTech is not affected by the risks in FinTech itself because it can be useful by the user. Thus, H1 is rejected. The results of H2 show the relationship between trust and perceived usefulnes exists. It provides the interpretation that trust in the use of FinTech services is needed so that FinTech services are always used. H2 is accepted. Moreover, in H3, it suggests a relationship between perceived ease of use and perceived usefulness. If the ease of service is provided, it will affect the usefulness of the service. Then, H3 is accepted.

Next, in H4, the result shows a relationship between perceived usefulness and intention to use. It implies that the usefulness of FinTech services is needed to influence someone's intention in using the FinTech service. Thus, H4 is accepted. The results of H5 state that the relationship between perceived usefulness and attitude toward use is not supported.

In H6, the result shows a relationship between the perceived ease of use and attitude toward use. It means that the convenience provided by FinTech services affects the users' attitude in using FinTech services. H6 is accepted. Last, in H7, it suggests a relationship between attitude toward use and intention to use. It states that in determining one's attitude in using services will affect one's intention to use it. It can be said that the certainty of a person's attitude will hugely influence someone's intention to use FinTech services. Thus, H7 is accepted.

V. CONCLUSION

The conclusion is that trust influences perceived usefulness for intention to use FinTech services. All of these provide a conclusion that the trust generated from FinTech services can improve the usefulness of services. Thus, it has an enormous influence on the intention of someone to use FinTech services which is in line with the research of Refs. [35, 37]. Likewise, the convenience provided by a service will affect the usability and attitude of a person. Then, it can further influence a person to use FinTech services. However, FinTech services that will be used by users do not necessarily weigh the potential risks posed by the service. They will adopt the service, if it can be easily used. The results also contribute to the study of the adoption of FinTech services, which can provide a view in determining the users' intention in using FinTech services.

A. Limitation

The limitation is in the process of collecting data. It is still not ideal in determining the respondents as the samples because the respondents are still focused on age and other categories. Therefore, they can have biased results that can influence this study. However, this research is critical if it can draw a respondent with a good composition.

B. Future Research

The current research is from the perspective of perceived risk and trust from the adoption of Fintech services so that further research can analyze from the perspective of the influence of social factorstrust and perceived risk in adopting FinTech services in Indonesia. Thus, future research provides more knowledge to the business in developing Fintech services in various aspects.

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TABLE VIII
t-STATISTIC VALUE.

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (STERR)	t-Statistics (O/STERR)
PR → PU	0.058	0.065	0.056	0.056	1.025
T → PU	0.298	0.291	0.087	0.087	3.420
PE → PU	0.569	0.574	0.081	0.081	7.049
PU → IU	0.249	0.254	0.084	0.084	2.967
PU → AT	0.186	0.186	0.145	0.145	1.282
PE → AT	0.563	0.568	0.132	0.132	4.252
AT → IU	0.656	0.655	0.071	0.071	9.258

TABLE IX
HYPOTHESIS RESULT.

Hypothesis	Path Coefficient	t-Statistics	Result
H1	0.058	1.025	Insignificant
H2	0.298	3.420	Significant
H3	0.569	7.049	Significant
H4	0.249	2.967	Significant
H5	0.186	1.283	Insignificant
H6	0.563	4.252	Significant
H7	0.656	9.258	Significant

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