International Journal of Management and Commerce
www.managementjournal.in
Online ISSN: 2664-6854, Print ISSN: 2664-6846
Received: 16-11-2021, Accepted: 03-12-2021, Published: 18-12-2021
Volume 3, Issue 2, 2021, Page No. 24-28

The influence of perceived risk on adoption of e-commerce during covid-19 pandemic

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Abstract
Technological advancement, especially in the financial sector, has resulted in many benefits to consumers. Since previous studies focused on the benefit of the positive utility, little is known how consumers evaluate the potential for loss for adoption probability. Therefore, the study sought to find the relationship between perceived risk and the adoption of technology services. Technology Acceptance Model (TAM), based on several empirically-tested aspects of Perceived Risk Theory, was used to analyze the electronic service adoption. The results showed that ease of use of e-commerce reduces perceived risk. This study provides an integrated framework for academicians to measure the effect of risk factors on technology acceptance. Furthermore, the finding will help identify important factors affecting users' decisions.

Keywords: perceived risk, technology acceptance model, e-commerce

Introduction

Problem Statement

The Covid-19 pandemic has led to the collapse of various offline businesses due to the limitation of commercial and social activities. However, some sectors, including the advancement of digital financial services, have thrived amidst the pandemic. This has led to increased use of the virtual cash service, which has proven easy, quick, practical, and suppresses the potential of economic inflation (Phua, 2020) [18]. The e-Conomy SEA 2020 report by Google, Temasek, and Bain showed that the annual gross merchandise value (GMV) of e-commerce in South East Asia dramatically increased by 63% to US$62 billion in the past year. This figure is expected to rise by 23% to US$172 billion by 2025. According to Pachpande and Kamble (2018) [17], e-commerce activities utilize electronic information technology to conduct business transactions among trading partners, either with or without electronic data. Eastin (2002) [8] categorized e-commerce into four main activities; shopping, banking, investing, and online electronic payment for internet service.

Vesta unveiled survey results duped the "Vesta Online Payments Sentiments Survey" that 57% of online shoppers in Indonesia, Singapore, and the Philippines indicated that encountering problems while shopping at e-commerce sites would make them stop transacting online. Subsequently, 47% of the respondents reported they had encountered transactional problems in the past 12 months (KataData, 2021) [3].

Hence, this research applied the technology acceptance model to explain the technology usage behavior during the Covid-19 pandemic. It is expected that various stakeholders, including service providers and marketers, will benefit from this research by adopting e-commerce technology from the users' point of view.

Theoretical Framework

Technology Acceptance Model (TAM) has two factors that influence technology adoption, including the user's perception of the ease of use and usefulness. According to Davis (1985) [6], TAM is designed to serve two functions primarily. First, it should improve the understanding of user acceptance and provide new theoretical knowledge related to the design and use of a successful information system. Second, it should serve as a theoretical framework for a practical user acceptance testing methodology in activating the design and system execution for evaluating new types proposed before implementation. Additionally, perceived usefulness is one's belief that using new technology will improve performance. Therefore, a user-friendly system helps generate and improve performance for its users. Both users' perception and usefulness are the key factors that underpin the users' acceptance of technology. The theory of the technology acceptance model (TAM) is illustrated in Figure 1 below.

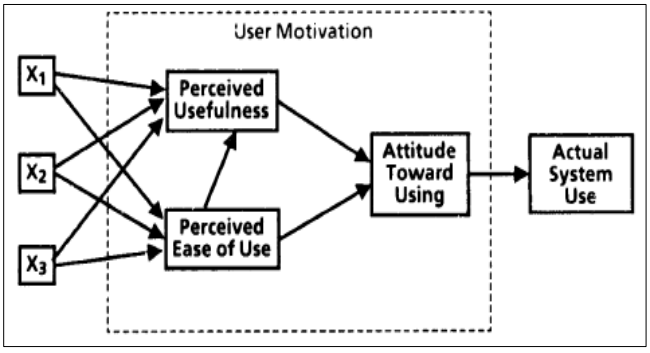

Fig 1: *Technology Acceptance Model (TAM)*

Davis (1985) [6] affirmed that 'intention to use' in the technology acceptance model is critical in influencing the actual use. Further, it was also found that there is a correlation between perceived usefulness and intention to use. This indicates that someone will use a given information system if they desire.

Hypotheses Development

Based on the theoretical framework and previous empirical studies, the hypotheses for this research are formulated as follows:

1. Perceived risk of the use of e-commerce on perceived usefulness of the use e-commerce

Perceived risk is the expectation of losing personal information (Bailey et al., 2019) [1]. This study includes perceived risk in the expanded TAM model to determine the users' acceptance of fintech. Notably, perceived risk in a product can significantly reduce its reliability and user loyalty. In mobile banking, perceived risk directly influences perceived usefulness (Li et al., 2019) [13]. Therefore, functional risk largely caused by the mobile transaction procedures requiring sensitive data and information details worries users (Chen and Li, 2017) [4]. This further leads to the formulation of the first hypothesis, as follows:

H1: The perceived risk of e-commerce has a negative influence on the perceived ease of use of e-commerce

2. Perceived ease of use of e-commerce on the perceived risk of use of e-commerce

Featherman and Pavlou (2003) [9] stated that perceived ease of use significantly reduces usage risks besides eliminating performance uncertainty and risk perception from customers. Therefore, the second hypothesis is formulated as follows:

H2: Perceived ease of use of e-commerce negatively influences the perceived risk of use of e-commerce.

3. Perceived ease of use of e-commerce on perceived usefulness of the use of e-commerce

User-friendly technology directly benefits its users (Sharma, Sharma, and Dwivedi, 2019) [21]. Therefore, mobile is preferred for payment because it is considered user-friendly (Dahlberg, Guo, and Ondrus, 2015) [5]. In line with the study, perceived ease of use significantly influences perceived usefulness in the context of accepting to use mobiles for payment (Liébana-Cabanillas et al., 2018) [14]. A previous study regarding factors that influenced millennial customers in the US to adopt tap-and-go payment technology showed that perceived ease of use influenced perceived usefulness (Bailey et al., 2019) [1]. Consequently, the third hypothesis is constructed as follows:

H3: Perceived ease of use of e-commerce has a positive influence on the perceived usefulness of e-commerce

4. Perceived ease of use and e-commerce adoption

Perceived ease is a dominant factor that determines the e-commerce technology to be adopted (Liu and Wei, 2003) [15]. A study on TAM by Bailey et al. (2019) [1] indicated that perceived ease of use of a given technology is the belief within an individual that a particular system would pose minimal challenges. This forms the fundamental reference of customer decision in using technology. The argument is in line with Singh, Sinha, and Liébana-Cabanillas (2020) [22], who observed that the variable of perceived ease of use has a significant influence on e-wallet adoption. Hence, the fourth hypothesis is formulated as follows:

H4: Perceived ease of use of e-commerce has a positive influence on e-commerce adoption

5. Perceived usefulness of e-commerce and its adoption

The technology acceptance model utilizes the causal relationship between belief, attitude, and behavior in elaborating and predicting the technology acceptance for its users. A study on mobile Alipay payment revealed that perceived usefulness has a significant and positive influence on the attitude towards using the method (Li et al., 2019) [13]. Another study shows that perceived usefulness is a dominant factor in persistent adoption (Lee, Ryu, and Lee, 2019) [12]. Therefore, the fifth hypothesis is established as follows:

H5: Perceived usefulness of e-commerce has a positive influence on e-commerce adoption.

Method

The study framework was constructed by considering empirical and theoretical elements. Theoretically, this research examined the technology acceptance model (TAM) with perceived risk and e-commerce adoption as a dependent variable. The independent variables used included perceived usefulness of the use of e-commerce, perceived ease of use of e-commerce, and perceived risk of the use of e-commerce.

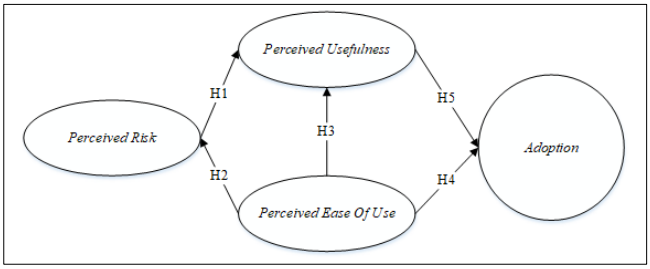

Fig 2: Framework Diagram

Identify Subsections

Data was collected with the help of electronic questionnaires distributed to the respondents for their feedback on the study questions. Furthermore, the study used nonprobability and purposive sampling to gather information from the selected population fulfilling a particular criterion (Sekaran & Bougie, 2013) [20].

The criteria of the samples used in this study include:

1. An individual with an e-commerce account.
2. An individual who had ever conducted a shopping transaction at least once by e-commerce during the Covid-19 pandemic.

The secondary data was obtained from various literature reviews in journals and other previous publications.

Sampling Procedures

The target population for this study involved people who had used the e-commerce payment system. According to Hair *et al.*, (2014), the minimum sample size should be >100 or at least five times greater than the number of question items to be analyzed. This implies that the acceptable sample size should be in the ratio of 10:1. In this study, there were 24 question items, which required minimum sample size of 240 respondents. However, the sample population was increased to 250 respondents to compensate for the rejected samples.

Research Design

Descriptive research was used to determine the correlation between benefit, security, convenience, and adoption of e-

commerce. Additionally, literature reviews were used to determine the research criteria, while descriptive analysis was used to summarize data and information constructively. The data was then processed using a quantitative approach and observed based on the obtained results. Furthermore, the study used structural equation modeling (SEM) to elaborate the correlation between various variables categorized into covariance-based SEM and partial least square SEM (Wang et al., 2018) [23]. Partial least square approach and SmartPLS 3.0 software for analysis.

Scale

Scaling involves determining a measuring unit's size, dimension, or capacity without physical quantity limitation. This indicates that it can be expanded to measure all imaginable matters such as uncertainty, resulting in a risk analysis to reduce loss. Subsequently, the variables were measured using a Likert scale with seven points ranging between "strongly disagree" to "strongly agree." The Likert scale measures an individual's perception and opinion concerning a social phenomenon. The series of questions used to gather information was derived from a study conducted by (Davis 1985) [6] and (Featherman and Pavlou, 2003) [9].

Results

The table below shows the involved in the research.

Table 1: Distribution of survey respondent

Measure	*Item*	*Frequency*	*Percentage*
Gender	Male	113	45.20%
	Female	137	54.80%
Age	40	25	10.00%
	30-39	55	22.00%
	20-29	122	48.80%
	10-19	25	10.00%
Education Level	High School	90	36.00%
	College/University	128	51.20%
	Master	32	12.80%
Province	Jawa	135	54.00%
	Sumatera	31	12.40%
	Kalimantan	19	7.60%
	Bali	65	26.00%
Frequency of using E-commerce in 1 Week	>5	98	39.20%
	6-10	72	28.80%
	11-15	43	17.20%
	16-20	37	14.80%
Monthly Income	Less Than IDR 1,000,000	32	12.80%
	IDR 1,000,000 - IDR 2,000,000	70	28.00%
	IDR 2,000,000 - IDR 4,000,000	83	33.20%
	IDR 4,000,000 - IDR 8,000,000	35	14.00%
	More Than IDR 8,000,000	30	12.00%

Source: Primary Data Analysis Result, 2021

The data obtained was processed using smartPLS 3.0 software to evaluate outer and inner models. The outer model was used to test the validity and reliability of the smartPLS 3.0 software. The result confirmed that the outer model fulfilled the rule of thumb consisting of convergent and discriminant validities and Cronbach alpha. All indicators of perceived risks, benefits, ease of use, and adoption fulfilled the validity and reliability conditions. The inner model testing was primarily used to test the hypotheses using the basic value obtained in the output result for inner weight. The rules of thumb for this analysis was t-statistics > 1.96, with a significant rate of p-value 0.05 (5%). The estimated output of the structural model test is displayed in the figure and table below.

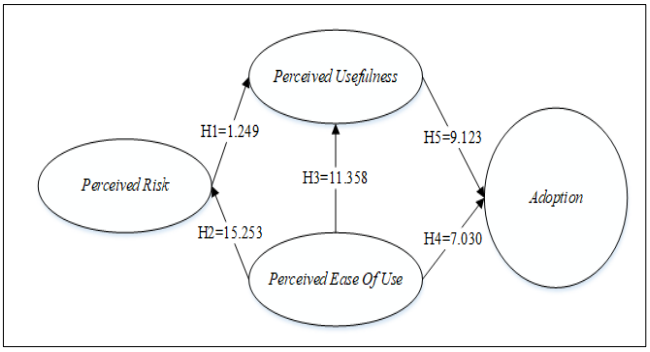

Fig 3: Research Model Results

Table 2: *Result for Inner Weigh*

Hypothesis		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Value
Hypothesis 1	PR -> PU	-0.080	-0.080	0.064	1.249	0.212
Hypothesis 2	PEOU -> PR	-0.548	-0.551	0.036	15.253	0.000
Hypothesis 3	PEOU-> PU	0.573	0.575	0.050	11.358	0.000
Hypothesis 4	PEOU -> A	0.363	0.364	0.052	7.030	0.000
Hypothesis 5	PU -> A	0.379	0.384	0.041	9.123	0.000

Source: Primary Data Analysis Result, 2021

The table above shows the statistical analysis of the correlation of each variable using output bootstrapping Smart PLS 3.0. The first hypothesis tested whether the perceived risk is influential on perceived usefulness. There was an insignificant influence for the results, in accordance with the obtained bootstrapping result of t-statistic 1.249 < 1.96, and the significant rate of p-value 0.212 > 0.05. Both results reported that perceived risk did not have any influence on perceived usefulness.

The second hypothesis tested whether perceived ease of use influences perceived risk. The result showed that the beta value of perceived ease of use was -0.548 with the t-statistic value of 15.253 and p-value of 0.00. Therefore, the second hypothesis was accepted because t-statistic > 1.96 with the p-value < 0.05. It proved that perceived ease of use negatively influenced perceived risk.

The third hypothesis tested whether perceived ease of use influenced perceived usefulness. The result showed that the beta of perceived ease of use was 0.573 with the t-statistic value of 11.358 and p-value of 0.00. Hence, the third hypothesis is accepted because t-statistic > 1.96 with the p-value < 0.05. It proved that perceived ease of use positively influenced perceived usefulness.

The fourth hypothesis tested whether perceived ease of use was influential on adoption. The test result showed that the beta of perceived ease of use was 0.363 with the t-statistic of 7.030 and p-value of 0.00. Consequently, the fourth hypothesis was accepted because t-statistic > 1.96 with the p-value < 0.05. It proved that perceived ease of use had a positive influence on the application adoption.

The fifth hypothesis tested whether perceived usefulness was influential on adoption. The result showed that the beta of perceived usefulness is 0.379 with the t-statistic of 9.123 and a p-value of 0.00. Therefore, the fifth hypothesis was accepted because t-statistic > 1.96 with the p-value < 0.05. It proved that perceived usefulness had a positive influence the adoption.

Table 3: Summary of Hypotheses Test

Hypothesis		Evaluation
Hypothesis 1	PR -> PU	Hypothesis Rejected
Hypothesis 2	PEOU -> PR	Hypothesis Accepted
Hypothesis 3	PEOU-> PU	Hypothesis Accepted
Hypothesis 4	PEOU -> A	Hypothesis Accepted
Hypothesis 5	PU -> A	Hypothesis Accepted

Discussion

Perceived risk is one of the factors that determine how consumers make decisions. From the analysis, it was noted that this factor hardly plays a significant role in the adoption of e-commerce. Based on previous literature, risk is a dominant factor when making short-term transaction decisions, while trust is considered the determinant variable in making short-term decisions (Gefen et al., 2003) [10].

Therefore, e-commerce adoption is not influenced by its risk. Moreover, e-commerce is able to anticipate and guarantee each possible risk in every aspect related to its users. Meanwhile, the perceived ease of use of e-commerce significantly reduced the consumers' performance uncertainty and perceived risk. This indicated that perceived ease of use and usefulness influences e-commerce services' adoption.

This study pointed to the importance of all managers, especially for online marketing, to recognize the perceived risk. Companies dealing with online marketing must focus on building customers' trust to reduce perceived risk (Dinev & Hart, 2006) [7]. Furthermore, since perceived ease of use reduces the perceived risk of consumers, it should be used as a reinforcement strategy to improve the relationship between consumers and the company. This study also recommends companies to redefine their marketing strategies and redesign their services through a high level of usefulness and visibility.

References

1. Bailey AA *et al.* 'Exploring factors influencing US millennial consumers' use of tap-and-go payment technology', *International Review of Retail, Distribution and Consumer Research*,2019:00(00):1-21. doi: 10.1080/09593969.2019.1667854.
2. Burhan Fahmi Ahmad, Kata Data. co.id, 2021. [Online] Available at: https://katadata.co.id/desysetyowati/digital/612f276167e21/e-commerce-di-asia-tenggara-jalani-3-tren-baru-saat-pandemi [Diakses 29 Oktober 2021].
3. Burhan, Fahmi Ahmad, 2021. KataData.co.id. [Online] Available at: https://katadata.co.id/yuliawati/digital/613ae2849f81e/riset-konsumen-ri-tinggalkan-e-commerce-bila-transaksi-bermasalah [Diakses 29 Oktober 2021].
4. Chen H, Li W. 'Mobile device users' privacy security assurance behavior A technology threat avoidance perspective', *Information and Computer Security*,2017:25(3):330-344. doi: 10.1108/ICS-04-2016-0027.
5. Dahlberg T, Guo J, Ondrus J. 'A critical review of mobile payment research', *Electronic Commerce Research and Applications*,2015:14(5):265-284. doi: 10.1016/j.elerap.2015.07.006.
6. Davis FD. 'A technology acceptance model for empirically testing new end-user information systems: Theory and results', *Management*, Ph.D, 1985, 291. doi: oclc/56932490.
7. Dinev T, Hart P. An extended privacy calculus model for e-commerce transactions. *Informaation Systems Research,2006:17*(1):61-80
8. Eastin MS. 'Diffusion of e-commerce: An analysis of the adoption of four e-commerce activities', *Telematics and Informatics*,2002:19(3):251-267. doi: 10.1016/S0736-5853(01)00005-3.
9. Featherman MS, Pavlou PA. 'Predicting e-services adoption: A perceived risk facets perspective', *International Journal of Human Computer Studies*,2003:59(4):451-474. doi: 10.1016/S1071-5819 (03) 00111-3.
10. Gefen D, Rao SV, Tractinsky N. The conceptualization of trust, risk and their relationship in electronic commerce: the need for clarifications. In *Proceedings of the 36th Hawaii International Conference on System Sciences, 2003.*
11. Kim G, Koo H. The causal relationship between risk and trust in the online marketplace: A bidirectional perspective, *Computers in Human Behavior*,2016:55:1020-1029
12. Lee J, Ryu MH, Lee D. 'A study on the reciprocal relationship between user perception and retailer perception on platform-based mobile payment service', *Journal of Retailing and Consumer Services*,2019:48:2018:7-15. doi: 10.1016/j.jretconser. 2019.01.007.

13. Li J *et al.* 'Mobile Payment with Alipay: An Application of Extended Technology Acceptance Model', *IEEE Access*,2019:7:50380-50387. doi: 10.1109/ACCESS. 2019.2902905.
14. Liébana-Cabanillas F *et al.* 'Predicting the determinants of mobile payment acceptance: A hybrid SEM-neural network approach', *Technological Forecasting and Social Change*,2018:129:117-130. doi: 10.1016/j.techfore.2017. 12.015.
15. Liu X, Wei KK. 'An empirical study of product differences in consumers' E-commerce adoption behavior', *Electronic Commerce Research and Applications*, 2(3), pp. 229–239. doi: 10.1016/S1567-4223(03)00027-9.
16. Oliveira T *et al.* 'Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology', *Computers in Human Behavior*,2016:61:404–414. doi:10.1016/j.chb.2016. 03.030.
17. Pachpande BR, Kamble AA. 'Study of E-wallet Awareness and its Usage in Mumbai', *Journal of Commerce and Management Thought*,2018:9(1):33. doi: 10.5958/0976-478x.2018.00004.6.
18. Phua K. The Jakarta Post, 2020. [Online] Available at: https://www.thejakartapost.com/academia/ 2020/07/13/why-indonesia-is-the-worlds-next-digital-payments-battleground.html [Diakses 30 July 2021].
19. Rabbi Cahya Puteri Abdi. KataData.co.id. [Online], 2021. Available at: https://katadata.co.id/maesaroh/berita/613830 afcdf06/uu-kesepakatan-e-commerce-asean-disahkan-mendag-ingin-perluasan-pasar [Diakses 29 Oktober 2021].
20. Sekaran U, Bougie R Research Methods for Business. 6th edition penyunt. s.l.:s.n, 2013.
21. Sharma SK, Sharma H, Dwivedi YK. 'A Hybrid SEM-Neural Network Model for Predicting Determinants of Mobile Payment Services', *Information Systems Management*,2019:36(3):243-261. doi: 10.1080/10580530. 2019.1620504.
22. Singh N, Sinha N, Liébana-Cabanillas FJ. 'Determining factors in the adoption and recommendation of mobile wallet services in India: Analysis of the effect of innovativeness, stress to use and social influence', *International Journal of Information Management*,2018:50:191-205. doi: 10.1016/j.ijinfomgt. 2019.05.022.
23. Wang S *et al.* 'Policy implications for promoting the adoption of electric vehicles: Do consumer's knowledge, perceived risk and financial incentive policy matter?', *Transportation Research Part A: Policy and Practice*,2018:117:58-69. doi: 10.1016/j.tra.2018.08.014.
24. Hair JF *et al.* 'Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research', *European Business Review*,2014:26(2):106-121. doi: 10.1108/EBR-10-2013-0128.