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HOW INFORMATION ASYMMETRIC INFLUENCES ONLINE LOAN WITHIN MOBILE-COMMERCE CONTEXT

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Abstract. *This study has successfully addressed how information asymmetric influences online loan within mobile-commerce context. Data was collected by online questionnaire survey and 326 valid samples were received. SEM was employed for analyzing the data. Findings from online loan consumers show that perceived ease of use can enhance his/her intention to purchase an online loan through the path of perceived usefulness and attitude to online loan when adopting the TAM model. Furthermore, the results also report the significant role of information asymmetric was confirmed only on perceived usefulness – the attitude to online loan path. Consequently, the firms of online loan should actively and completely announce the consumer the interest rates of the loan, the breach of contract damages, and all of the payback conditions.*
Keywords: Information asymmetric, Online loan, Mobile-commerce

1. **Introduction.** Information asymmetric originated in the field of economics. It originally meant the inconsistency between the quantity and quality of information held by both parties to a transaction [1]. Because the parties to the transaction have different levels of information about the transaction, those with rich information resources are often in a better position than those with poor ones. Therefore, the theory is used to explain many economic and social phenomena, and it has also proved to be a very fruitful framework for analyzing many types of markets [2,3].

For example, investors may have doubts about the diversification of business operations: entering new fields or expanding new businesses because they are not familiar with relevant investment details and information. The research of Chien et al. [4] found that when financial holding companies diversify their business, they will not increase the information asymmetric of investors to the company doubt. For another example, in the field

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of auditing, the emergence of information asymmetric will greatly reduce audit efficiency and audit effectiveness, and even greater audit risks. Solving the problem of information asymmetric has become one of the key tasks of the audit department [5]. In the field of logistics, in the context of information asymmetric, how to ensure the expected effect of logistics service outsourcing, how to determine the risk category in a timely and accurate manner, and take preventive measures are issues that manufacturers urgently need to solve [6]. Even in the field of education, academic misconduct is related to information asymmetric. Al-Hamad et al. [7] had presented one of the issues with extended TAM which was associated to education. Research has pointed out that academic misconduct is mainly due to the information asymmetric between the author and the publisher (editor), and trying to let the author expose his or her private information as much as possible is needed. Information or behavior, eliminating the information asymmetric between authors and editors, plays an important role in reducing or even eliminating academic misconduct [8].

Though the impacts of information asymmetric in different fields have been made, no literature concerning online loan study was given. There is a gap and need to fill up on its application to online loan context. Therefore, in the era of information explosion, exploring the impact of information asymmetric on consumer behavior will help companies formulate marketing policies, protect consumers' rights and interests, and better meet the interests of both parties to transactions.

Moreover, in the era of the development of information technology and the popularization of mobile phones, more and more consumers use mobile phones to conduct machine transactions. In addition to ordering takeaways and purchasing daily necessities, they also use mobile phones for banking services, such as transfers, placing orders to buy stocks, loans, etc. and both of them make mobile commerce flourished. In addition to the COVID-19 virus infestation in 2020, human life, school life, and working life all over the world are inseparable from mobile phones. The development of mobile commerce brings convenience to consumers, but it also hides many information asymmetries. For example, it is easier for many citizens to apply for online loans through mobile phones due to the convenient operation of mobile loans. However, some product loan treaties are unclear, or mobile phone operation interfaces are unclear, or some mobile phone users improperly operate, etc., causing information asymmetric between the parties to the transaction. For example, consumers are not clear about the calculation of loan interest rates and the calculation of liquidated damages, etc. These problems have also led to frequent disputes in online loan transactions in the future, and it is urgent to find out how to deal with online loan behavior problems with information asymmetric.

In this context, this research attempts to combine information asymmetric theory and technology acceptance model (TAM) to explore the perceived ease of use and perceived usefulness of online loan consumers, and the relationship between attitude to online loan and intention to purchase an online loan, and clarify the influence of information asymmetric on the relationship between model variables.

2. Materials and Methods.

2.1. **Research framework and research hypothesis.** The research framework of this research is shown in Figure 1. According to the technology acceptance model, there is a correlation between perceived ease to use, perceived usefulness, attitude to online loan, and intention to purchase an online loan. For significantly positive correlation, perceived ease of use significantly affects perceived usefulness (H1) and attitude to online loan (H2); perceived usefulness significantly affects attitude to online loan (H3); attitude to online loan significantly affects intention to purchase an online loan (H4) [9-11]. Accordingly, the following hypotheses are proposed:

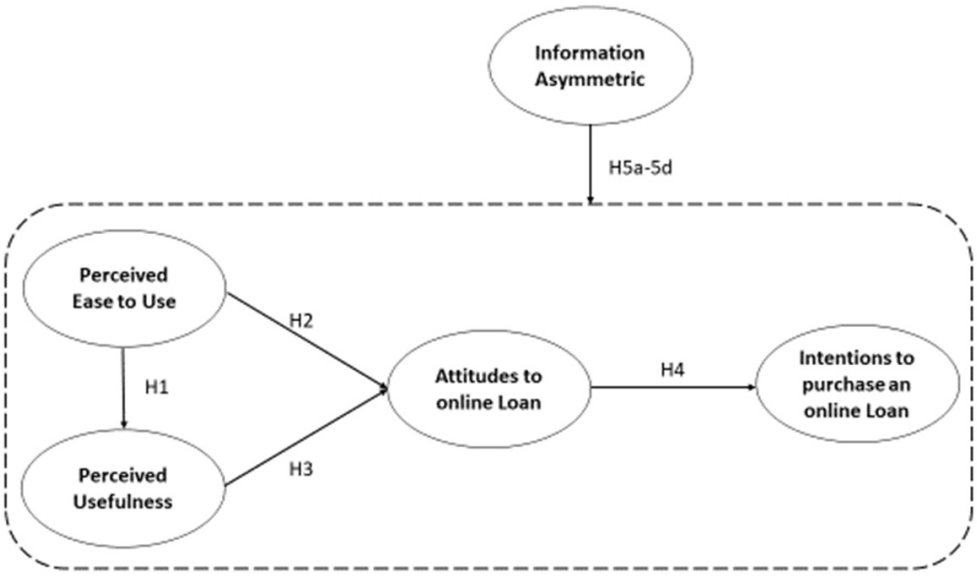

FIGURE 1. Research model

Hypothesis 1: When consumers use their mobile phones to apply for online loans, perceived ease to use is likely to have a significant effect on perceived usefulness; Hypothesis 2: When consumers use their mobile phones to apply for online loans, the perceived ease to use is likely to have a significant effect on their attitude to online loan; Hypothesis 3: When consumers use their mobile phones to apply for online loans, perceived usefulness is likely to have a significant effect on their attitudes to online loan; Hypothesis 4: When consumers use their mobile phones to apply for online loans, their attitudes to online loan are likely to have a significant effect on their intentions to purchase an online loan.

Moreover, based on the research of information asymmetric by Liu [5], Hu [6], Liu [8], etc., this research suspects that the relationship between variables may be different in the context of information asymmetric. For example, consumers have already sensed the convenience of using mobile phones for online loan operations and can input and store data at any time, regardless of the business hours of physical business locations. Although mobile phone operation is convenient, compared with the information and consumer data owned by the lender (bank), the lender (consumer) still lacks knowledge of the calculation method of loan interest and liquidated damages, and the loan evaluation standards on the Internet are different. Some people applaud and others criticize that the information weakness of the lender (consumer) may shake its attitude to online lending. Accordingly, the following hypotheses are proposed.

Hypothesis 5: When consumers use their mobile phones to apply for online loans, the situation of information asymmetric is likely to have a significant effect on their online payment variable relationships; among them, Hypothesis 5a: The situation of information asymmetric is likely to have a significant effect on the relationship between their perceived ease of use of online payments and perceived usefulness; Hypothesis 5b: information asymmetric is likely to have a significant effect on the relationship between the perceived ease to use with attitude to online loan; Hypothesis 5c: information asymmetric is likely to have a significant effect on the relationship between the perceived usefulness of online payment with attitude to online loan; Hypothesis 5d: The situation of information asymmetric is likely to have a significant effect on the relationship between the attitude to online loan and intention to purchase an online loan.

2.2. **Measure development and data collection.** The measurement used in this study adopts the scale developed by predecessors, which reveals adequate reliability and validity. Among them, perceived ease to use, perceived usefulness, attitude to online loan and

intention to purchase an online loan are mainly based on previous studies [9-11]. Three questions to perceived ease of use were adopted: it is easy to search online loan information through mobile phone, it is easy to handle online loan and it is easy to deal with online loan problems. There are four questions about perceived usefulness, which are that you can quickly run online loans through mobile phones, convenient tools for online loans, real-time processing of online loans, and it is useful to process online loans. It is a good idea to use smart phones to handle online loans, a smart idea to handle online loans and a favorite idea to handle online loans were adopted to measure the attitude to online loans. Finally, three questions to intention to purchase an online loan were adopted: I will try to apply the online loan in the coming six months; I will try to apply the online loan if appropriated; I will try to apply the online loan in the future.

Specially, based on the research of Liu [5], Hu [6], Liu [8], and consumer interviews, five questions to information asymmetric has developed: how to deal with liquidated damages, more loan channels, lower interest rate loans, more loan amount and more appropriate loan period. All questions are measured by Likert's five points scale. 5 means extremely agree, 4 means agree, 3 means ordinary, 2 means disagree, and 1 means extremely disagree. The higher the overall facet score, the higher the degree of agreement. For information asymmetric, the higher the score, the lower the information asymmetric.

The purpose of this study is to clarify the relationship between variables and collect data using a questionnaire survey method. Taking account of the information confidentiality of the lender and the difficulty of obtaining the original data, the data collection of this study adopts the invitation method and builds it on the questionnaire. Then the website is forwarded to specific WeChat groups and Moments, and people with online loan experience are solicited through the online questionnaire to answer. Respondents were asked to fill in their loan experience, and after confirming that they had online loan experience, they answered the questions item by item. The questionnaire was launched in July 2021, and a total of 326 valid questionnaires were received by August 31, 2021. The valid questionnaire rate was 100%.

The questionnaire was posted on Questionnaire Start System. The message about questionnaire survey link was sent to relevant groups in July, 2021. Of 326 questionnaires obtained, about 54% were male and 46% were from female respondents. About 31% of respondents were 20-29 years of age, 24% of respondents were 30-39 years of age, 38% of respondents were 40-49 years of age, 7% of respondents were above 50 years of age. Approximately 25% of respondents were graduated from senior high school or below, 28% of respondents received a college degree and the majority of respondents got a bachelor degree (47%). With regard to the occupation, 4.3% of respondents work at government related sectors, 10.7% of respondents belong to industrial sector, 31.9% of respondents were businessman, 8.6% of respondents were farmers, 8% of respondents were students, and 36.5% of respondents were retired/else. Approximately 15.3% of respondent's monthly income was below 3000 RMB, 34% of respondent's monthly income was 3001-6000 RMB, and 17.5% of respondent's monthly income was 6001-8000 RMB while 33.2% of respondent's monthly income exceeds 8000 RMB. The correlation matrix of measurement was listed in Appendix A.

3. **Results.** Three-stage analytical procedures suggested by Anderson and Gerbing [12] were conducted to validate the measurement model, baseline model and nested model. Validity and reliability were first assessed by measurement model, the relationships for the baseline model were further estimated by structure model, and the moderated model were validated lastly using the maximum-likelihood method.

3.1. **The first stage: The assessment of measurement model.** As shown in Table 1, the model fit indexes were lied within the range of the recommended thresholds. This

Table 1. Convergent validity

Constructs	Indicators	Items reliability		*t*-value	CR	AVE
		SFL	SE			
Perceived ease of use	EU1	0.842**	0.291	18.18	0.869	0.690
	EU2	0.887**	0.213	19.72		
	EU3	0.754**	0.431	15.46		
Perceived usefulness	PU1	0.806**	0.360	17.09	0.897	0.686
	PU2	0.777**	0.399	16.18		
	PU3	0.829**	0.272	17.67		
	PU4	0.853**	0.224	18.51		
Attitudes to online loan	AT1	0.909**	0.181	21.17	0.948	0.860
	AT2	0.936**	0.124	22.26		
	AT3	0.943**	0.116	22.58		
Intentions to purchase an online loan	IN1	0.865**	0.248	19.32	0.914	0.779
	IN2	0.953**	0.096	22.73		
	IN3	0.826**	0.318	17.97		
Information asymmetric	IA1	0.748**	0.440	15.66	0.944	0.686
	IA2	0.866**	0.250	19.52		
	IA3	0.904**	0.183	20.98		
	IA4	0.930**	0.135	22.07		
	IA5	0.934**	0.128	22.24		

SFL: Standardized factor loading; SE: Standard error; CR: Composite reliability; AVE: Average variance extracted; EU: Perceived ease of use; PU: Perceived usefulness; AT: Attitudes; IN: Intentions; IA: Information asymmetric; $^{**}p < .01$; $\chi^2 = 383$, $d.f. = 123$, $p = .000$, $\chi^2/d.f. = 2.81$, GFI = 0.89, AGFI = 0.84, CFI = 0.96, RMSEA = 0.081

Table 2. Discriminant validity of constructs

Item	M	SD	EU	PU	AT	IN	IA
EU	6.67	3.63	0.831				
PU	9.10	5.00	0.791**	0.828			
AT	8.79	4.60	0.618**	0.720**	0.927		
IN	10.23	4.26	0.484**	0.573**	0.725**	0.883	
IA	15.49	6.61	0.454**	0.499**	0.541**	0.687**	0.828

$^{**}p < .01$; EU: Perceived ease of use; PU: Perceived usefulness; AT: Attitudes; IN: Intentions; IA: Information asymmetric; Diagonal elements are the square root of average variance extracted. Off-diagonal elements are the coefficients of correlation between factors.

confirms the data fit the proposed model well. The standardized factor loadings (SFL) exceed the recommended value of 0.70 and all indicators used in this study were significantly loaded on their corresponding factors [13]. The convergent validity of the constructs in the measurement model was met. Furthermore, AVE values of the constructs were also above the level of 0.50, which proves suficient convergent validity of the measurement model [14]. The squared root of AVEs presented on the diagonal was above the correlations between the variables (Table 2). This implies that the discriminant validity of the variables was evidenced [14]. Moreover, CR values were all above the recommended level of 0.70 (Table 1), which indicates acceptable internal reliability of the constructs [13]. Consequently, the validity and reliability were confirmed and this allowed our study to examine the structure relationships for baseline model.

3.2. **The second stage: The assessment of baseline model.** As shown in Table 3, the relationships of TAM were estimated in Model 1, Model 2, and Model 3. The overall

TABLE 3. Hypotheses testing for baseline model

Paths	M1	M2	M3
	Estimate(t)	Estimate(t)	Estimate(t)
H1: EU-PU	0.87***(10.19)	0.87***(10.09)	0.87***(10.09)
H2: EU-AT		−0.14(−1.11)	−0.14(−1.15)
H3: PU-AT		0.84***(6.32)	0.84***(6.37)
H4: AT-IN			0.78***(11.32)
R^2_{PU}	0.75	0.76	0.76
R^2_{AT}		0.52	0.52
R^2_{IN}			0.60
χ^2	18	79	145
$d.f.(p)$	10(.054)	27(.00)	56(.00)
$\chi^2/d.f.$	1.80	2.93	2.60
GFI	0.985	0.953	0.939
AGFI	0.958	0.904	0.901
CFI	0.995	0.983	0.977
RMSEA	0.05	0.077	0.070

**$p < .01$; ***$p < .001$

fit indexes for the Model 3 were adequate and the relationships of TAM were confirmed. As expected, the EU-PU relationship, PU-AT relationship, and AT-IN relationship were significantly and positively confirmed while the EU-AT relationship was not verified.

3.3. **The third stage: The assessment of nested model.** In order to estimate the effect of information asymmetric within the baseline model, a structural invariance test was conducted. In order to generate the baseline model, the survey responses were split into high and low novelty-seeking groups based on median from the result of descriptive analysis. The high group included 156 cases, and the low group included 170 cases. As shown in Table 4, the baseline model generated had an excellent fit to the data. It was compared to the nested models in sequence where a particular linkage is restricted to be equivalent across high and low novelty-seeking groups, employing a Chi-square test. Results from Table 4 revealed the Chi-square difference test from the linkage of PU to AT was significantly different between high and low groups, and thus the moderated effect of IA on PU-AT was supported. This implies PU will not impact AT while IA was low, and it did while IA was high. High asymmetric information could significantly foster the effect of perceived usefulness on the attitude to online loan.

3.4. **The suggestions for firms of online loans.** Consequently, the firms of online loan should actively and completely announce the consumer the interest rates of the loan, the breach of contract damages, and all of the payback conditions. Moreover, the message of those information on the interface of the mobile phone should be highlighted and put in the first page, which can be conducted in advance. This could decline the probabilities of information asymmetric to consumer when purchasing an online loan.

4. **Conclusion.** This study has validated the causal relationships of perceived ease of use, perceived usefulness, attitude to online loan, and intention to purchase an online loan within an M-commerce context. Findings from online loan consumers show that perceived ease of use can enhance his/her intention to purchase an online loan through the path of perceived usefulness and attitude to online loan when adopting TAM model. Furthermore,

Table 4. Hypotheses testing of moderated effects

Paths	M1 (IAL, $n = 170$)	M2 (IAH, $n = 156$)	M3 (Baseline model)	M4 (Nested model)
	Estimate(t)	Estimate(t)	$\chi^2(d.f.)$	$\chi^2(d.f.)$
EU-PU	0.968(1.52)	0.865***(5.39)	286(118)	286(119)
EU-AT	1.479(0.69)	−0.253(−1.15)	286(118)	289(119)
PU-AT	−0.677(−0.44)	0.966***(4.12)	286(118)	295(119)
AT-IN	0.768**(3.16)	0.597***(5.94)	286(118)	286(119)
R^2_{PU}	0.938	0.749		
R^2_{AT}	0.707	0.574		
R^2_{IN}	0.590	0.357		
Chi-squire testing				
H5a	$\Delta\chi^2/\Delta d.f. = 0$			
H5b	$\Delta\chi^2/\Delta d.f. = 3$			
H5c	$\Delta\chi^2/\Delta d.f. = 9$, Supported			
H5d	$\Delta\chi^2/\Delta d.f. = 0$			

$^{**}p < .01$; $^{***}p < .001$

the results report the significant role of information asymmetric was confirmed only on perceived usefulness – the attitude to online loan path.

Moreover, the potential future research trend is suggested that future study could clarify the reasons why perceived ease of use does not significantly impact attitudes to an online loan. Furthermore, other moderated factors and situational ones which possibly impact intention to purchase an online loan can be concerned by the coming studies. Specially, the habitual factor, such as the inertia of Internet usage, is recommended to future study.

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Appendix A. Correlation matrix of measurement ($n = 326$)

			Perceived ease of use			Perceived usefulness				Attitudes to online loan			Intentions to purchase an online loan			Information asymmetric				
Item	**M**	**SD**	**EU1**	**EU2**	**EU3**	**PU1**	**PU2**	**PU3**	**PU4**	**AT1**	**AT2**	**AT3**	**IN1**	**IN2**	**IN3**	**IA1**	**IA2**	**IA3**	**IA4**	**IA5**
EU1	2.04	1.33	1																	
EU2	2.13	1.32	.778**	1																
EU3	2.50	1.45	.612**	.635**	1															
PU1	2.20	1.41	.628**	.687**	.563**	1														
PU2	2.08	1.37	.636**	.637**	.558**	.766**	1													
PU3	2.42	1.43	.562**	.618**	.673**	.662**	.679**	1												
PU4	2.40	1.46	.561**	.623**	.658**	.683**	.647**	.786**	1											
AT1	2.94	1.62	.452**	.462**	.604**	.543**	.546**	.631**	.665**	1										
AT2	2.84	1.59	.464**	.534**	.601**	.572**	.529**	.641**	.700**	.856**	1									
AT3	3.01	1.62	.430**	.487**	.626**	.578**	.545**	.610**	.692**	.855**	.880**	1								
IN1	3.17	1.58	.413**	.438**	.505**	.494**	.424**	.560**	.621**	.599**	.635**	.687**	1							
IN2	3.34	1.54	.348**	.373**	.473**	.433**	.386**	.524**	.575**	.651**	.669**	.714**	.828**	1						
IN3	3.73	1.51	.270**	.296**	.397**	.376**	.288**	.411**	.457**	.555**	.601**	.612**	.691**	.789**	1					
IA1	3.22	1.50	.362**	.371**	.329**	.385**	.320**	.386**	.487**	.476**	.484**	.486**	.608**	.656**	.625**	1				
IA2	2.95	1.47	.328**	.372**	.327**	.420**	.341**	.424**	.470**	.456**	.466**	.442**	.513**	.596**	.528**	.658**	1			
IA3	3.07	1.47	.346**	.380**	.331**	.388**	.266**	.374**	.426**	.435**	.421**	.416**	.488**	.547**	.549**	.678**	.793**	1		
IA4	3.12	1.44	.340**	.396**	.401**	.411**	.338**	.423**	.486**	.470**	.484**	.484**	.518**	.593**	.561**	.652**	.808**	.846**	1	
IA5	3.12	1.46	.365**	.396**	.383**	.396**	.294**	.408**	.465**	.461**	.504**	.482**	.554**	.614**	.587**	.704**	.793**	.842**	.878**	1

**$p < 0.01$