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P2P lending: Moderation of desirability of control on risk-taking decisions of Indonesian borrowers

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The number of users of peer-to-peer (P2P) lending applications in Indonesia continues to grow rapidly even though it is followed by increased cases of alleged criminal violations in the financial sector. Users continue to use these financial technologies despite being aware of the high risks and potential negative consequences they may receive. Meanwhile, the results of previous research in the context of financial technology show that the higher the risk perceived by users, the more discouraged they are from using financial technology. In addition, the number of studies that discuss decision-making at the user group level is still limited. Tests using the structural equation model (SEM) method showed that the desirability of control moderates the negative effect of perceived risk on P2P lending usage intention. The desirability of control is proven to weaken the effect of perceived risk on the intention to use P2P lending. As a result, borrowers with high desirability of control tend to ignore the high risk of using online lending providers so they will continue to take these actions. Meanwhile, borrowers with low desirability of control try to maintain their control by avoiding the use of P2P lending. In addition, the Bollen–Stine bootstrap procedure also showed that the model meets the goodness of fit even though the data was not normally distributed in multivariate analysis. The results of this study also imply that the government needs to formulate regulations to tighten lending procedures to minimize the potential for defaults on debt that harm the community and online lending providers.

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Introduction

P2P lending applications can have a positive impact because they allow lending transactions to be carried out anywhere and anytime. The lender and the borrower do not have to meet each other directly to carry out the transaction (Otoritas Jasa Keuangan, 2017, 2019). However, this seemingly simple business process that can reach the greater community also brings some new problems. Lembaga Bantuan Hukum Jakarta (2020a) stated that it received around 5093 reports of alleged criminal acts committed by P2P lending application providers as of February 2020. The forms of alleged criminal offenses reported by borrowers include threats, fraud, slander, dissemination of personal data, and sexual harassment through electronic media. The number of cases continues to increase when compared to 2018 which was only around 3000 complaints (Lembaga Bantuan Hukum Jakarta, 2020b).

The increased number of P2P lending cases calls for an increase in public awareness of the high risks of using P2P lending. Previous studies have shown that the higher the perceived risk of an action, the lower the intention to take the action (Abramova and Böhme, 2016; Gumussoy et al., 2017; Mohseni et al., 2018; Mutahar et al., 2018; Ryu, 2018). Perceived risk can even increase due to a lack of understanding of the new technology being used (Bauer et al., 2005). In addition, a negative attitude toward an intended behavior can also refrain an individual's intention to perform the behavior (Fishbein and Ajzen, 1975; Ajzen, 2011). So, the high risk of using P2P lending should reduce people's intention to use the application.

However, the results of this previous study contradict the facts of the growth of the P2P lending business. Otoritas Jasa Keuangan (2020) noted the rapid growth of the P2P application business in terms of accumulation of credit distribution, growth in the number of borrower accounts, and the increasing number of lender accounts. The growth in the number of users shows that people are still enthusiastic in using P2P lending even though they have to face high risks.

According to Trimpop (1994), the behavior of borrowers who still want to use P2P lending applications can be categorized as a form of risk-taking behavior. Borrowers knowingly or unknowingly take actions that may result in negative consequences for themselves. Risk motivation theory (RMT) states that one of the individual factors that influence the emergence of risk-taking behavior is the desirability of control (Trimpop, 1994). The desirability of control is the dispositional tendency of individuals to desire control over their environment and experiences (Burger and Cooper, 1979). The desirability of control makes individuals consistently try to gain control and reduce the level of uncertainty in the results or consequences of an action or event (Trimpop, 1994).

Individuals with high desirability of control tend to be assertive, active, and like to manage. In general, individuals of this type like to influence other people and situations around them to gain the desired consequences or results. In contrast, individuals with low desirability of control are less assertive and passive. They tend to like to be led by others (Burger and Cooper, 1979). They are described as individuals who are less comfortable if they have to decide on several choices.

The results of previous research reviews also show that high desirability of control makes individuals always strive for control and only want to be involved in certain actions or situations that are seen as providing more control so that they have a greater chance of getting the desired results (Burger and Schnerring, 1982; Burger, 1989; Faraji-Rad et al., 2017; Hammond and Horswill, 2002). However, an individual's assessment of an action is often only based on a subjective view so it tends to ignore the level of objective risk or various negative consequences that do exist in the action to be taken. As a result, they are trapped in actions or situations that are riskier than before. Conversely, individuals with low desirability of control tend to avoid new actions or situations that are considered risky even though these actions or situations have better results or consequences. They prefer the usual outcomes or consequences but provide more certainty (Faraji-Rad et al., 2017).

Following up on the results of this review, the desirability of control is thought to strengthen or weaken the effect of perceived risk on the emergence of an intention to take an action. The relationships between these variables are depicted in Fig. 1. The fundamental question that will be investigated in this study is "Does desirability of control moderate the effect of perceived risk on P2P lending usage intention?" and "How does desirability of control affect the emergence of risk-taking behavior?". Therefore, the hypotheses in this study are:

H1: The perceived risk has a significant negative effect on P2P lending usage intention.

H2: Desirability of control negatively moderates the effect of perceived risk on P2P lending usage intention.

This study then aims to find out more about the moderating effect of the desirability of control on the decision-making process of users of financial technology (fintech) at the group level. According to Ryu (2018), research on the behavior of fintech users at the group level is still limited, so further studies are needed to explore this area. The results of this study can also help to increase understanding of personality factors that can influence borrowers in taking risky actions. In addition, this research may provide P2P lending application providers and the government with a better understanding of the behavior of using P2P lending so that they can implement more optimal consumer management strategies while minimizing the potential negative impacts that arise, both on consumers and the company's business development.

Methodology

Measurement development. The questionnaire in this study consisted of three scales, namely the P2P lending usage intention scale, the perceived risk scale, and the desirability of control scale. The P2P lending Usage Intention was developed by referring to the intention scale construction guide from Fishbein and Ajzen (2010). This scale consists of three items and is in the form of a semantic differential scale, and has 7 ranges of answer choices (see Supplementary Table S1). A value that is closer to 7 indicates that respondents have more intention to use P2P lending. After passing the content validity index-revised scale (CVI-S/R) test, the researcher conducted a trial on 50 borrowers. The results show that the P2P lending usage intention scale has a Cronbach's alpha value of 0.921. In addition, all values of convergent validity, average variance extracted (AVE), and construct reliability after the confirmatory factor analysis test was >0.50 (see Table 1). As
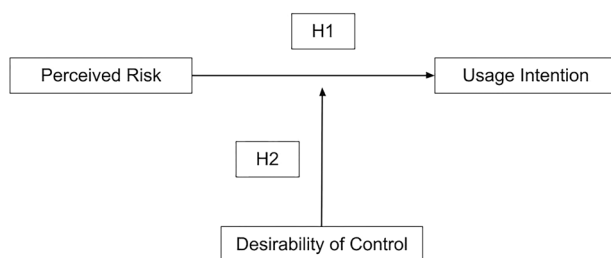
Fig. 1 Research model. The model shows two hypotheses tested in this research and the position of the desirability of control as a moderator of the influence of perceived risk on usage intention.

Table 1 Validity and reliability of the items.

Variable	Number of items	Item codes	Alpha coefficient	Convergent validity	AVE	Construct validity
Usage intention	3	IN_1	0.921	0.856	0.789	0.918
		IN_2		0.934		
		IN_3		0.873		
Perceived risk	3	PR_1	0.792	0.742	0.637	0.838
		PR_2		0.931		
		PR_3		0.702		
Desirability of control	3	DS_4	0.940	0.890	0.521	0.721
		DS_10		0.675		
		DS_15		0.561		

explained by Ghozali (2017), this value indicates that the scale is valid and reliable.

Furthermore, the perceived risk scale was compiled by adapting the perceived risk scale from Ryu (2018). After obtaining permission from the scaler, the researcher began to carry out adaptation procedures according to Gudmundsson's (2009) guidelines. In this study, the perceived risk scale has 3 items and is rated on a 7-point Likert Scale, ranging from 1 "Strongly Disagree" to 7 "Strongly Agree" (see Supplementary Table S2). The higher the score on the perceived risk scale indicates the higher the risk perceived by the borrower when using P2P lending. The test results on the perceived risk scale show Cronbach's alpha of 0.792. In addition, the results of the CFA perceived risk scale show values of convergent validity, AVE, and construct reliability at >0.50.

Meanwhile, the desirability of control scale was adapted from the research of Burger and Cooper (1979) after obtaining permission from the authors. This scale is also arranged in the form of a 7-point Likert Scale. The items are listed in Supplementary Table S3. The higher the score on the desirability of control scale indicates the higher the borrower's desirability of control. After passing the CVI-SR test, the researcher conducted a reliability test on the desirability of control scale. The desirability of control scale generated an alpha of 0.940. Convergent validity, AVE, and construct validity values generated during CFA testing were also >0.50.

Data collection. The participants in this study were borrowers who were currently or have used P2P lending. Determination of these criteria is done based on Trimpop's (1994) statement, that individuals always reassess the actions they have taken so that the perceived risk before acting and after carrying out these actions can be different. In addition, a convenience sampling technique was applied, due to limited access to detailed data on the borrower population owned by each P2P lending provider. According to Supratiknya (2015), the convenience sampling technique allows researchers to get samples easily because it may retrieve a high number of participants as long as they meet the requirements.

An online link to the research questionnaire page was distributed to participants via social media groups comprising undergraduate students, graduate students, entrepreneurs, and employees. The link contained informed consent and questionnaires. When opening the link, respondents were immediately briefed on the research they will be participating in. They were also allowed to contact the researcher if they had questions about the study. After understanding the information presented, a total of 211 participants decided to take part in this study. All participants were directed to the next section and asked to fill out a questionnaire containing the three scales. The age range of the participants was 18–65 years (see Supplementary Table S4). Meanwhile, their fields ranged from college students (35.55%),

private sector employees (21.33%), government employees (7.11%), entrepreneurs (7.11%), public sector employees (2.84%), professional (2.84%), security service (0.47%), and other fields (22.75%).

Data analysis. Abdillah and Hartono (2015) explained that the structural equation model (SEM) method is more appropriate to use in research that aims to test a theory. According to this explanation, SEM is used as a data analysis method to test the model's accuracy and the moderation of desirability of control on the effect of perceived risk on P2P lending usage intention. The implementation of the SEM method is carried out using the Amos 23 application and refers to the explanation by Kline (2011).

The data obtained in this study was first tested for multivariate normality to ensure that the SEM assumption test requirements are met. According to Gao et al. (2008), the multivariate normal distribution is fulfilled if the assumption of univariate normal distribution for each variable is supported, and each pair of these variables also fulfill the bivariate normal distribution. Based on the explanation given by Ghozali (2017), multivariate normality can be determined from the value of critical ratio (c.r.) multivariate, c.r. skewness, and c.r. kurtosis. The c.r. multivariate value is an asymptotically distributed normal standard (Gao et al., 2008). The c.r. value multivariate which is in the range of $-2.58 <$ c.r. < 2.58 (p-value of 0.01) indicates that the data met the normality assumption (Ghozali, 2017). The data was declared not significantly different from normal data (Gao et al., 2008). Thus, there is sufficient empirical evidence to support the normality of the data.

The next testing stage was hypothesis testing. The desirability of control moderation testing was done by using the interaction method. As explained by Ghozali (2017), the implementation of the interaction method began with the interaction of the two exogenous variables consisting of independent variables and moderator variables. In this study, the perceived risk will interact with the desirability of control so that it seems to form a new variable called interaction. The process is then continued by calculating the loading factor, error variance, and the estimated value of the effect of the interaction variable on the dependent variable. According to Baron and Kenny (1986), the moderating hypothesis will be fulfilled if the path of the interaction variable on the dependent variable is significant. In this study, $p < 0.05$ will be used to express the significance of the relationship between variables.

In addition to testing the hypothesis, the researcher also conducted a goodness of fit test to determine the accuracy of the model. Kline (2011) recommends to avoid sticking to a single indicator in stating the accuracy of a model. Therefore, this research used several values of absolute fit indexes as listed in Table 2. According to Kline (2011), absolute fit indexes denote the proportion of covariance in the sample data matrix described by the model.

Table 2 The goodness of fit indicators.

Indeks	Critical Value	Description	Source
CMIN (X^2)	–	CMIN describes the difference between restricted covariance and unrestricted sample covariance. The greater the chi-square value is from the DF, the greater the difference is in the obtained covariance matrix from the predicted covariance matrix.	Ghozali (2017)
P	–	Probability value	
df	–	The difference between the number of observations' parameters and the number of observations.	Kline (2011)
CMIN/DF (X^2/DF)	≤2.00	An index that measures the acceptable fit between the proposed model and the data.	Ghozali (2017)
Goodness of Fit Index (GFI)	≥0.90	GFI measures the covariances' proportion in the sample data matrix that can be explained by the model.	Kline (2011)
Root mean square error of approximation(RMSEA)	≤0.08	RMSEA is the badness-of-fit index of the proposed model.	Kline (2011)

Table 3 Description of research data.

Variable	N	Range	Min	Max	Mean		Std. deviation	Variance
					Statistics	Std. error		
Desirability of control	211	18	3	21	13.33	0.234	3.395	11.526
Perceived risk	211	18	3	21	16.21	0.259	3.759	14.128
Usage intention	211	14	3	17	5.54	0.259	3.769	14.202

Table 4 The results of the participant score categorization.

Category	Desirability of control		Perceived risk		Usage intention	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Low	16	7.6	6	2.8	166	78.7
Medium	122	57.8	56	26.5	33	15.6
High	73	34.6	149	70.6	12	5.7
Total	211	100	211	100	211	100

Result

The results of descriptive statistics for each variable can be seen in Table 3. The desirability of control has an average value of $m = 13.33$. Meanwhile, the average value of perceived risk is $m = 16.21$ and usage intention is $m = 5.54$. The researcher also categorized these scores according to the guideline written by Azwar (2012) to find out the tendency of the participant's responses to each variable. As listed in Table 4, most of the participants had desirability of control scores which were classified as medium. Most of them also tend to perceive P2P lending applications as high-risk applications and tend to be reluctant to use P2P lending applications.

In the multivariate normality test, the value of c.r. skew and c.r. kurtosis has a range of −8.931 to 9.826 and −2.966 to 6.720, respectively (see Supplementary Table S5). The c.r. value multivariate is also 33.625, indicating that the assumption of multivariate normality is not supported. As shown in Table 4 previously, the participants' responses tended to be high or low for each variable. Most participants perceive P2P lending as risky, causing the perceived risk variable curve to skew to the right. In addition, more participants were reluctant to use P2P lending applications, causing the assumption of normality of usage intention to also be unsupported. The overall responses of these participants modestly describe the phenomena that occur in the context of P2P lending in Indonesia. If measured separately between variables, the participants considered P2P lending as a risky application, hence they had small to no intention to use it. However, multivariate normality or joint normality will be difficult to achieve if the normality assumptions for each variable are not supported (Ghozali, 2017).

Furthermore, the data collection process was carried out without using a random sampling process. All participants can be involved in this research as long as they met the requirements as a borrower. This study also seeks to obtain data that represents the actual conditions so it does not filter participants' responses. Therefore, the researcher followed Kline's (2011) recommendation to carry out the bootstrap procedure as a form of adjustment for non-normal data.

During hypothesis testing, the maximum likelihood (ML) method was used to analyze the value of the influence of perceived risk on P2P lending usage intention. As shown in Table 5 and Fig. 2, the results show that perceived risk has a significant negative effect (estimate = −0.302; $p < 0.001$) on the emergence of intention to use P2P lending. Thus, H1 is accepted. Furthermore, the interaction variable also has a negative and significant effect (estimates = −0.010; $p < 0.001$) on the emergence of P2P lending usage intention. That is, the desirability of control weakens the effect of perceived risk on the emergence of intention to use P2P lending, hence H1 is declared accepted.

Table 6 shows that most of the model test results meet the goodness of fit criteria. Only the value of $p = 0.000$ does not meet the chi-square test criteria. Kline (2011) recommends conducting

Table 5 Result of path analysis.

Structural path	Standardized estimate	SE	Result
H1: Perceived risk → Usage intention	−0.302***	0.095	Supported
H2: Interaction → Usage intention	−0.010***	0.002	Supported

***Significant at the 0.001.
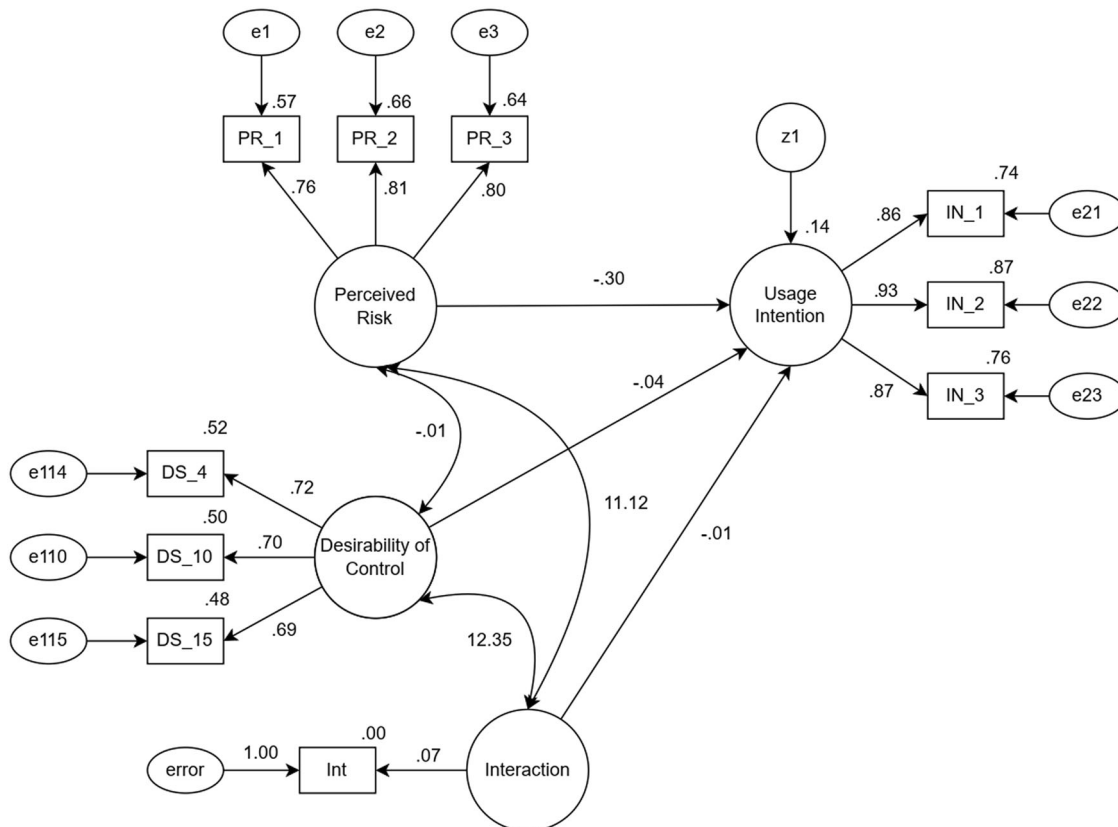
Fig. 2 The hypothesis test result of the desirability of control moderation. It shows the value of the model test as well as the value of the results of the moderation test using the interaction method.

Table 6 Result of model fit.

Index	Value	Result
CMIN	62.613	–
p	0.000	Not fit
CMIN/DF	2.087	Marginal
GFI	0.946	Fit
RMSEA	0.072	Fit

value generated from each data sample is then processed to obtain the average chi-square value. This average chi-square value will be the critical value for the chi-square test in testing the fit model. The model will be considered able to describe the research data if it has an insignificant Bollen–Stine p-value.

In this study, the Bollen–Stine bootstrap procedure resulted in a p-value of 0.025 ($p > 0.01$). That is, there is no significant difference between the data and the model proposed in this study. Thus, the research model is declared capable of describing the data obtained.

further diagnostics if the model does not meet the chi-square test criteria. Moreover, the chi-square test is sensitive to the distribution shape of the data. Data that does not meet the multivariate normality assumption may influence the chi-square value to be overestimated or underestimated than it should be (Kline, 2011). Therefore, the Bollen–Stine bootstrap procedure was carried out as a form of adjustment to the data in this study.

Based on the explanation of Bollen and Stine (1993), the bootstrapping technique works by resampling the research data. The data in the research will be assumed as population data. The bootstrapping process then draws samples from the data repeatedly and transforms the data from each sample to support the assumption of model accuracy with the data. The chi-square

Discussion

P2P lending is one of the business sectors in Indonesia that has rapid growth every year (Otoritas Jasa Keuangan, 2020). However, this business growth was followed by an increase in the number of reports of alleged criminal acts committed by P2P lending application providers (Lembaga Bantuan Hukum Jakarta, 2020a). This phenomenon is interesting because it shows that Indonesians still want to use P2P lending even though it has a high risk. This study then aims to determine the factors that influence the emergence of P2P lending behavior despite the accompanying risks.

This study found that overall perceived risk has a negative and significant effect on the emergence of P2P lending usage intention. These results are consistent with previous studies conducted by Gumussoy et al. (2017) and Ryu (2018) who also found a negative effect of perceived risk on usage intentions. In this study, perceived risk makes borrowers tend to be reluctant to use P2P lending because borrowers feel that they will not gain optimal benefits when using the application.

In the next stage, this study found a moderating effect of the desirability of control on the effect of perceived risk on the intention to use P2P lending. The influence of perceived risk becomes weaker on borrowers with high desirability of control. Borrowers with high desirability of control tend to be easier to take action or engage in risky situations. This finding is also consistent with the explanations of Burger and Cooper (1979), Hammond and Horswill (2002), and Trimpop (1994).

In line with Sari et al. (2017), borrowers only need additional funds to meet their urgent needs. The situation experienced by borrowers then becomes more urgent when their lending application is rejected by the bank and does not meet certain requirements. This whole situation then makes borrowers feel that their chances of survival are at stake. At the same time, P2P lending offers easier terms and faster processes. Their transactions also can be done anywhere and anytime. However, the presence of P2P lending is still not balanced with effective regulations to protect its users (Hidajat, 2020).

Borrowers with high desirability of control respond to the conditions they experience by continuing to apply for loans in the P2P lending application. High desirability of control makes borrowers tend to ignore the increasing number of complaints of alleged P2P lending crimes. They only focus on the results or consequences of the actions to be taken, namely receiving additional funds to fulfill their needs. The ease of access provided by P2P lending service providers also makes borrowers with high desirability of control feel in control and confident that they will get the desired results or consequences from their actions. So, they have the intention to apply for loan funds in the P2P lending application.

Meanwhile, perceived risk has a stronger influence on borrowers with low desirability of control. They tend to discourage using P2P lending because they are trying to avoid negative risks or consequences that they cannot control from these actions. In this way, they will still have control over their environment and experiences.

In addition, the test results show that the chi-square and probability values do not meet the model fit test criteria. Following the direction of Kline (2011), the researcher then carried out a diagnosis to find out why the model did not pass the chi-square test. The diagnosis process then found that convenience or non-probability sampling technique causes the data to be not normally distributed. As a result, the chi-square value becomes higher than it should be so it seems to reject the proposed model.

To solve the chi-square calculation problem, Kline (2011) recommends performing a bootstrap procedure and calculating the values of absolute fit indexes which is more robust to the shape of the data distribution and the number of samples. The results of the Bollen–Stine Bootstrap procedure then show that the model still meets the goodness of fit criteria. In addition, the values of absolute fit indexes showed that the model proposed can explain the covariances in the sample data.

Theoretical and practical implications. There are several theoretical implications of this research. The effect of perceived risk on usage intention is weaker when the individual has a high desirability of control. In the context of borrowing behavior, individuals with a high desirability of control are increasingly trying to get certainty that they will have access to additional funds. They will increasingly ignore the various risks of the action to receive the loan.

The government can draft regulations that require online lending service providers to tighten lending procedures. Loans can only be made to people who do have the potential to repay their loans. This strategy needs to be done because consumer appeals and education that targets cognitive processes are potentially less effective in preventing people with high desirability of control from using online lending applications. In addition, this strategy can be used to prevent potential defaults that harm both parties.

Conclusion and limitations

Overall, this study found that the desirability of control negatively moderated the effect of perceived risk on P2P lending usage intention. The higher the desirability of control an individual has, the weaker the influence of perceived risk on the intention to use P2P lending. Borrowers with high desirability of control will ignore the various risks they perceive because they still intend to use P2P lending to obtain the loan they need. Meanwhile, borrowers with low desirability of control prefer not to use P2P lending applications because they try to avoid situations or actions with a high level of uncertainty and risk.

However, this study has some limitations. The sampling technique used in this study is convenience sampling. This technique is used as an alternative to the random sampling technique which is constrained by the data protection policy of consumer financial services. However, the use of non-probability techniques affects the shape of the distribution of the data obtained and the processing procedures. To overcome this limitation, future researchers can work with government institutions and fintech companies during the data collection process. Thus, future researchers still can obtain data using random sampling techniques without violating data protection policies. In addition, the accuracy of data analysis will increase.

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Author contributions

SAI analyzed and interpreted the data regarding P2P lending borrowers, and was a major contributor in writing the manuscript. S compiled a research design based on the P2P lending phenomenon and the previous theoretical background. All authors read and approved the final manuscript.

Competing interests

The authors declare no competing interests.

Ethical approval

This study received ethical approval from the Research Ethics Committee, Faculty of Psychology, Gadjah Mada University (Ethics approval number: 394/UN1/FPsi.1.3/SD/PT.01.04/2021). The procedure used in this study adheres to the tenets of the Declaration of Helsinki.

Informed consent

This study did not ask respondents to state their identity other than age, gender, and field of work. Informed consent was obtained before the respondent proceeded to the stage of filling out the online survey. The information written includes an overview of the research, procedures carried out to maintain the confidentiality of respondent data, and researchers who can be contacted if further explanation is needed.

Additional information

Supplementary information The online version contains supplementary material available at https://doi.org/10.1057/s41599-023-01785-w.

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