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FACTORS INFLUENCING BACKER FUNDING INTENTION IN CROWDFUNDING: PSYCHOLOGICAL CONTRACT VIOLATION PERSPECTIVE

Qun Zhao^{1,4}, Chun-Der Chen^{2,*}, and Jin-Long Wang³

Key words: crowdfunding, funding intention, psychological contract violation, perceived reciprocity.

ABSTRACT

Literature has highlighted the importance of psychological contract violation (PCV) on employee attitudes and behaviors in an organization. However, few studies have empirically introduced this concept in a crowdfunding context. This study aims to propose a comprehensive framework to examine the effects of perceived product innovation, PCV and trust in a crowdfunding platform on backer attitudes and their funding intentions. Results show that perceived reciprocity for backers and PCV are the most important factors leading to backers' funding intentions. Moreover, perceived reciprocity channels the effects of perceived product innovation, PCV, and trust in the crowd-funding platform on backers' funding intention. Both theoretical and practical implications are also discussed.

I. INTRODUCTION

Crowdfunding has been attracting widespread attention in recent years. These Internet-based platforms are a financial boon for individuals and group entrepreneurs worldwide who have a dream but lack the funding to realize it (e.g., Belleflamme et al., 2014; Mollick, 2014). Kickstarter is an example of a reward-based crowdfunding platform. Since its official launch in 2009, Kickstarter has repeatedly created miracles, including many projects that successfully raised millions of dollars (Mollick, 2014). According to the Massolution crowdfunding report, the total amount of global fundraising more than doubled to US\$43.4 billion in 2015 from US\$16.2 billion in 2014. It is estimated that by 2025, fundraising will surpass

US\$300 billion (André et al., 2017). In addition, the report emphasized the striking growth in Asian crowdfunding platforms particularly, with a growth rate of 320%, and the total amount of funds reaching US\$3.4 billion. Asia is now the world's second-largest crowdfunding market, after North America.

In spite of the tremendous growth of crowdfunding, there are several hidden risks, such as delayed product delivery, patent infringements, and even malicious fraud. The innovative, projection-based smartwatch Ritot, that displays diverse information compared to conventional watch screens on the wearer's wrist or arm, can be considered an example. This project exceeded its own goal of raising US\$50,000 in just one week after it was posted on Indiegogo, and eventually raked in total funds of about US\$1.4 million. This watch was originally expected to be delivered in June 2015, but by then, not even the product prototype was feasible. Another example is of 3D Systems, which sued the start-up Formlabs for not successfully delivering the product after fundraising. Kickstarter, which assisted Formlabs in the fundraising, was also named in the suit (Zhao et al., 2017). Although most project creators strive to honor their promises, more than 75% of the crowdfunded projects have delayed product delivery or do not ultimately deliver products that were promised (Mollick, 2014), thereby causing dissatisfaction among backers and decreasing their confidence in crowdfunding. The Massolution report states that the success rate of crowdfunding projects on most platforms is less than 50% (Zhao et al., 2017). Due to the increasing reports of contract violations in crowdfunding projects, this research introduces the psychological contract theory into the crowdfunding context. In this study, we analyzed the impact of perceived product innovation, PCV, and trust in crowdfunding platforms on the attitude of backers (i.e., perceived risk, perceived reciprocity) and their subsequent behavior (i.e., funding intention) from three aspects—project, psychological contract, and platform.

The contributions of this study are manifold. First, we extend PCV to the crowdfunding context and hope to understand the crucial role of PCV in influencing backer-proposer relationships. Studies have discussed PCV in the context of organizational relationships (e.g., Niehoff and Paul, 2001),

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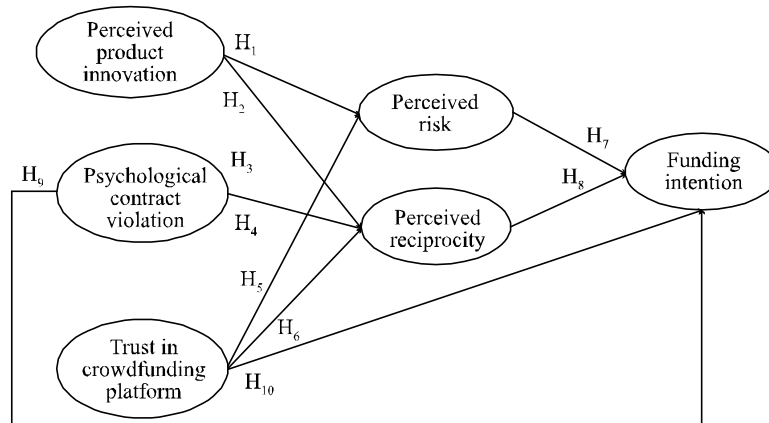


Fig.1. Conceptual structure

IT-outsourcing interfirm relationships (e.g., Koh et al., 2004), and buyer-seller transactions in the online marketplace (e.g., Pavlou and Gefen, 2005; Chiu et al., 2013), but few studies have discussed PCV in crowdfunding. There have been increasing reports of proposers violating contracts in crowdfunding projects; thus, this research posits that perceived PCV of backers in crowdfunding will have an important effect on their funding intention. Second, reciprocity is a mechanism underlying social exchange (Gouldner, 1960). Bagozzi (1995) argued that reciprocity is embedded in consumer-firm relationships and there should be a balance between “giving” and “receiving” in a good consumer-firm relationship. Research on reciprocity in marketing management is still in a nascent stage, and Bagozzi (1995) emphasized that future research on relationship marketing should explore the psychological aspect of reciprocity and how it fulfills its role in the daily exchanges of consumers. This study discusses the effect of perceived reciprocity on funding behaviors of backers. We hope the findings of this study will provide a new explanation as to why potential backers would still be willing to fund a crowdfunding project in spite of the potential threats of PCV in crowdfunding. Third, most of the research attention has been given to Western crowdfunding platforms (e.g. Kickstarter, Indiegogo), but only a few studies have explored perceptions, attitudes, and behaviors of backers on Asian platforms (Zhao et al., 2017). Because of cultural and legal differences, the findings from Western samples may not be generalizable to Asia. With the development of crowdfunding in Asian countries, our study expects to bring more insights into backer behaviors in Asia.

II. THEORETICAL BACKGROUND AND HYPOTHESES

Fig.1 identifies the key constructs and main relationships among them. As shown, this study mainly analyzes the impact of perceived product innovation, PCV and trust in crowdfunding platforms on the backers’ perceived risk and perceived

reciprocity, which in turn, influences their funding intention in reward-based crowdfunding.

1. Psychological contract violation

A psychological contract is defined as the mental beliefs and expectations of contracting parties about their mutual obligations in a contractual relationship, based on perceived promises of a reciprocal exchange (Rousseau, 1989), whereas a promise is treated as any communication of future intent. Several means can be utilized to convey the future intent, such as written documents, oral discussions, organizational practices, policies, and so on. As a psychological contract entails a trust of what one is obliged to provide based on perceived promises of a reciprocal exchange, when individuals encounter a discrepancy between what they expected would happen and what they perceive to have happened, it results in a contract breach (Dulac et al., 2008). PCV occurs when people experience negative emotions resulting from a contract breach, such as disappointment or frustration, or even anger or betrayal.

Scholars in the field of organizational behavior have repeatedly found the pivotal role of PCV in negative influence as the blueprint guiding employee cognitive perception and behaviors (e.g., Dulac et al., 2008). In the field of information systems and e-commerce, Chiang et al. (2012) found that PCV significantly decreased organizational commitment of IS personnel and subsequent leaving intention. Pavlou and Gefen (2005) found that PCV with an individual seller negatively affects the buyer’s perception of all community sellers in online auctions. However, in the crowdfunding context, this is one of the first studies to examine the role of PCV in affecting backer attitudes and funding intentions.

2. Perceived reciprocity

Gouldner (1960) defined reciprocity as the moral norm that explains the provision of benefits and engenders obligations to repay for the benefits received. Reciprocity refers to a set of rules agreed to by both parties during social exchanges; that is,

when one party provides help or certain resources to the other party, the latter is obliged to repay the former. Bock et al. (2005) argued that reciprocity is a mutually beneficial behavior, and individuals often benefit from one another to ensure sustained exchanges. Deckop et al. (2003) indicated that anyone who fails to repay his/her debts is likely to cause conflict and a breakdown in reciprocity, and thus threatens the stability of the social group. Studies have also indicated that reciprocal giving is key to increase the success of reward-based crowdfunding campaigns. For instance, André et al. (2017) found that the project pledges relying on reciprocal giving are more successful than others (e.g., pure utilitarian logic, altruism). They also suggested crowdfunding platforms should foster reciprocal relationships between proposers and backers.

In this study, perceived reciprocity refers to the perceived reciprocal obligations of backers to crowdfunding proposers. Crowdfunding provides a platform for both to establish reciprocal relationships. When the proposers promise to provide the backers with high-quality innovative products at discounted prices, based on the norm of reciprocity, the backers feel an obligation to help them realize their entrepreneurial dreams earlier and also to acquire their desired products as soon as possible by means of providing funds, giving advice, and so forth. Furthermore, how a consumer returns the favor to a product or service provider depends on how the former interprets the behavior of the latter (Keysar et al., 2008). Therefore, this study used perceived reciprocity to represent the willingness of backers to consciously maintain a reciprocal relationship with the project proposers.

3. Effects of perceived product innovation on perceived risk and perceived reciprocity

Perceived product innovation refers to the backers' subjective judgement of how much the products of a crowdfunding project differ from other actual or ideal products of the same type in terms of novelty and practicality (Stock and Zacharisa, 2013). Kulviwat et al. (2007) found that consumers experience both positive emotions, such as surprise, excitement, and happiness as well as negative emotions, such as annoyance, anxiety, and fear, when they think of product innovation. Forster et al. (2010) pointed out that novelty can be seen both as an opportunity to evoke consumer interest and curiosity and as a potential threat that raises public concerns about safety. When customers cannot feel the connection with products they have previously used, it leads to image inconsistencies. This could result in customers attempting to delay or resist adopting innovative products.

Perceived risk is the customer perception of the possibility of negative consequences after obtaining an object, or the degree of subjectively perceived loss after an individual has obtained an object (Featherman and Pavlou, 2003). Previous studies have shown divided opinions on the relationship between perceived product innovation and perceived risk. Ali et al. (1995) indicated that innovative products come with different usage methods that lead to increased technological risks for

consumers. However, Jung et al. (2014) studied the MMORPG (massively multiplayer online role-playing games) type in online games, and found that customers' perceived product innovation forms a positive attitude toward playing because designers tend to adopt user-centered designs and have friendly online user-game interface, while also simplifying the game mechanism, reducing operational complexity and barriers to use for players, leading to reduced perceived risk for players.

In crowdfunding, a higher level of backer-perceived product innovation means that the product has more novel design and unique functions. However, it could also indicate that the product differs more significantly with existing products in the market in terms of its appearance or use, which may increase the consumer-perceived operational complexity or safety concerns, thereby increasing consumers' perceived risks regarding the new product. In addition, these unique features or functions of innovative products might also require addition of newer technologies. This will increase backers' concerns about whether the new technology can be applied successfully or whether the new functions would meet expectations, leading to increased perceived funding risk. Hence, we propose the following hypothesis:

H1. Backers' perception of product innovation is positively associated with perceived risk.

Previous studies have indicated that product innovation serves as an important signal indicating that manufacturers will deliver higher quality products with more innovative designs than those in the market (e.g., Stock and Zacharias, 2013). Product innovation also proves that a company can keep up with the current trends in technological development and continue to provide consumers with more unique features to better satisfy their needs (Hsieh et al., 2008).

Perceived reciprocity refers to the backers' willingness to consciously maintain reciprocal and mutually beneficial relationship with the project proposers (Malhotra et al., 2017). Based on the norm of reciprocity (Gouldner, 1960), when backers can sense that the proposers have made considerable efforts in the research and development of innovative products with unique functions and the modification and improvement of existing products to better fulfill market needs, they may feel a reciprocal obligation to help the proposers achieve their entrepreneurial goals by means of financial support or advice on product development and so forth. Hence, this gives rise to the following hypothesis:

H2. Backers' perception of product innovation is positively associated with their perceived reciprocity.

4. Effects of PCV on perceived risk and reciprocity

Pavlou and Gefen (2005) defined PCV in the setting of online marketplaces as customers' perception of sellers' failure to perform their duties and obligations in the psychological contract. Hill et al. (2009) argued that customers' psychological contract is the perception of corporate responsibility, and PCV occurs when customers believe that corporate behavior

harms their own interests. PCV creates a sense of betrayal and unfair treatment, and thus increases people's need to monitor the relationship (Niehoff and Paul, 2001).

In online marketplaces, PCV makes consumers keep a more watchful eye on the possible opportunistic behavior of sellers to reduce any adverse consequences, thereby increasing their perceived risk in online shopping (Pavlou and Gefen, 2005). According to Prive (2014), as crowdfunding takes place on online platforms, information asymmetry exists between the two parties involved in financing. It is difficult for backers to obtain necessary data and make informed choices; hence, they are highly susceptible to fraud risks. Therefore, when they realize that PCV behaviors such as delivery delays, product misrepresentation or even fraud may exist in crowdfunding, their fear of adversity in the future will intensify, which will increase their perceived risk in funding a project. This study thereby hypothesizes the following:

H₃. PCV is positively associated with backers' perceived risk in crowdfunding projects.

Rabin (1993) divided reciprocity into positive and negative reciprocity and pointed out that positive reciprocity is a reward for friendly behavior, while negative reciprocity is retaliation for malicious behavior. When people are treated in an unfriendly manner, they often have a negative reciprocal response. When potential backers sense that project proposers have made great efforts to execute the proposal, based on the norm of reciprocity, they will feel a strong reciprocal obligation. Conversely, when the backers perceive that proposers on crowdfunding platforms are engaged in opportunistic or dishonest conduct, they will feel betrayed and disappointed (Niehoff and Paul, 2001; Malhotra et al., 2017). This will undermine the sense of reciprocity between backers and proposers, and reduce their fulfillment of reciprocal obligations. Hence, we develop the following hypothesis:

H₄. PCV is negatively associated with backers' perceived reciprocity.

5. Effects of trust in crowdfunding platform on perceived risk and perceived reciprocity

Trust is at the heart of uncertain interpersonal interactions and commercial exchanges (e.g., Morgan and Hunt, 1994) and plays an important role in risky scenarios (Mayer et al., 1995). McKnight et al. (2002) mentioned that consumers' trust in e-commerce websites that they are unfamiliar with or are using for the first time is influenced by institutional trust. Therefore, this study uses trust in the platform to represent backers' institutional trust in the crowdfunding platform. We posit that backers' institutional trust in the platform comprises aspects such as the security mechanism, refund mechanism, proposer review mechanism, and reputation of the platform. These can enhance backers' trust in the proposers. Previous studies have shown that institutional trust in the platform enhances consumers' trust in transaction partners, leading to trust-related

behaviors such as purchase, cooperation, and information sharing. For instance, Chiu et al. (2013) indicated that trust in online stores is positively related to buyers' repeated purchase intention.

In crowdfunding, backers' trust in the platform (such as the belief that the platform has adequate security mechanisms, strict project review and regulatory mechanisms, and a good reputation) will reduce their perceived risk in funding a project. Therefore, we propose the following hypothesis:

H₅. Backers' trust in a crowdfunding platform is negatively associated with perceived risk.

Trust means that one party has confidence in the reliability and integrity of the other party in an exchange (Morgan and Hunt, 1994). Reciprocity enhances the willingness of consumers to establish trust and commitment with exchange partners (e.g., Cialdini and Goldstein, 2004). Wu et al. (2008) conducted a survey of 308 printer users in Hong Kong and found that users' brand trust and brand loyalty positively affect their reciprocity, which in turn affects their future purchase intentions. Consumers with greater trust in a brand are often more willing to strengthen their reciprocal relationships with that supplier. For instance, they provide more personal use information and advice to those suppliers, believing that the supplier will not disclose or abuse their personal information. At the same time, they also hope that these suppliers will value their suggestions and provide safe and high-quality products or services in return. Therefore, trust can strengthen the reciprocal relationship between consumers and suppliers.

In crowdfunding, this study considers that backers' trust in a platform will increase their willingness to establish a reciprocal relationship with the proposers. A higher level of backers' trust in the platform means that the backers are confident that the platform will guarantee the product quality and the punctuality of delivery through corresponding mechanisms (e.g. strict review, tracking and punishment mechanisms). Such confidence will enhance the backers' willingness to repay the proposers. Hence, this study develops the following hypothesis:

H₆. Backers' trust in a crowdfunding platform is positively associated with their perceived reciprocity.

6. Effects of perceived risk and perceived reciprocity on backers' funding intention

Matic and Vojvodic (2015) explored the online shopping behavior of the Y-Generation and found that perceived risk negatively affects consumers' purchase intention. Amaro and Duarte (2015) explored the factors involved in consumers' intention to purchase travel products online. The study found that both trust and perceived risk are influencing factors, and trust influences consumers' intention to purchase travel products online due to consumers' perceived risk.

In crowdfunding, backers are regarded by researchers as consumers or customers (e.g., Ordanini et al., 2011). Therefore,

backers' funding intention is equivalent to consumers' purchase intention. Compared with face-to-face shopping, online shopping does not allow shoppers to touch or feel the actual products; therefore, it involves a higher level of risk (Hong and Cha, 2013). For crowdfunding activities based on online platforms, many products are merely concepts or prototypes at the fundraising stage, and there are many uncertainties such as delivery delays or failure to deliver. Therefore, backers will perceive a higher level of risk. They may be concerned that the product quality of the fundraising project may not live up to promises, that the proposers may delay the delivery, or that there may be counterfeits on the market. These concerns will reduce the possibility of the backers' funding. Consequently, we propose the following hypothesis:

H7. Backers' perceived risk is negatively associated with their funding intention.

Wu et al. (2008) verified the impact of reciprocity on consumers' purchase intention in Eastern culture. They found that brand loyalty, brand trust, and product familiarity would enhance consumers' reciprocal willingness and, thus, increase their purchase intention. Fehr and Gächter (2000) found that the reciprocal intention of decision-makers helps to enhance assistance and develop the relationship between partners in a mutually beneficial and friendly direction.

In crowdfunding, when proposers promise to provide backers with high-quality and innovative products at discounted prices, backers' perceived reciprocal obligations will be engendered. The greater the backers' reciprocal intention, the more they want to repay the proposers. Such repayments include funds, advice, and the like. Therefore, this study tests the following hypothesis:

H8. Backers' perceived reciprocity is positively associated with their funding intention.

7. Effects of PCV and trust in crowdfunding platforms on backers' funding intention

PCV is a crucial variable in organizational behavior. In the past, many scholars explored PCV from different perspectives and dimensions and revealed its role in predicting employees' negative behavior (e.g., Robinson and Rousseau, 1994). In the context of online marketplaces, Pavlou and Gefen (2005) argued that PCV perceived by customers includes fraud, contract default, product misrepresentation, delivery delays, product quality issues, and payment issues. The results of this study showed that PCV significantly reduces customers' online transaction intention and subsequent transaction behavior.

Mollick (2014) selected the fundraising projects on Kickstarter, the world's most influential crowdfunding platform, as a research target. The survey results showed that only 24.9% of the projects were delivered on time. In addition, according to CNN Money's report, among the top 50 fundraising projects with the highest amount of funds on Kickstarter, 84% eventually experienced delivery delays (Pepitone, 2012). As a result, backers were unable to fully understand the progress of

project implementation and were not sure whether they would receive the products as scheduled and whether the products received would match the original descriptions; these worsen their feeling of being cheated. Consequently, their funding intention regarding crowdfunding projects decreases. Hence, this study proposes the following:

H9. Backers' perception of PCV is negatively associated with their funding intention.

Previous studies have shown that trust has significant impact on users' willingness to engage in online transactions involving money and sensitive personal information (Gefen et al., 2003). The study by Hoffman et al. (1995) revealed an important reason behind consumers' hesitation in making purchasing decisions—they lack the basic trust in the products or services. Hong and Cha (2013) studied factors that influence consumers' online purchase intention and found that trust directly affects their purchase intention, while the lack of trust is the primary reason for consumers to give up buying products from online retailers.

In crowdfunding, when backers have a higher degree of trust in a platform, they will believe that the platform has set up mechanisms to review the proposers and restrain their opportunistic behavior. Thus, they have confidence in the quality of the products and the punctuality of delivery, which increases their funding intention. Hence, this gives rise to the following hypothesis:

H10. Backers' trust in a crowdfunding platform is positively associated with their funding intention.

III METHODOLOGY AND RESEARCH DESIGN

1. Sample and data collection

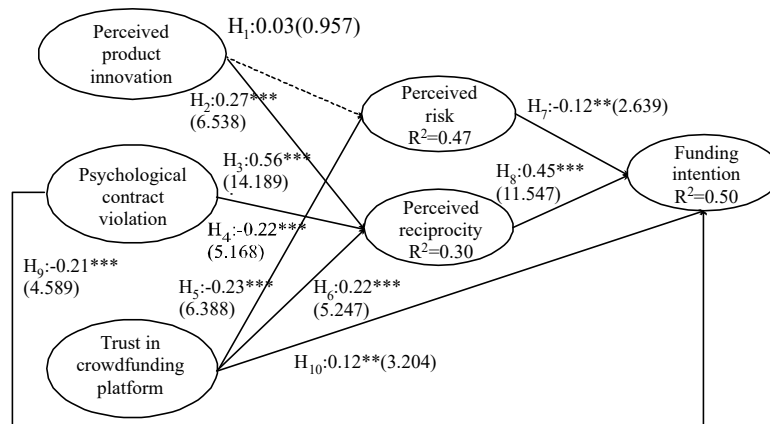
This study collected data from a sample of experienced backers of reward-based crowdfunding in China. It is considered appropriate for two reasons. First, the awareness of crowdfunding in Asia is increasing, with Asia now being the world's second largest crowdfunding market after North America (Zhao et al., 2017). According to estimates by the World Bank, China will generate 52 percent of the global total in crowdfunding by 2025, which will make China the largest crowdfunding market in the world (Shira, 2017). Second, previous studies have indicated that reward-based crowdfunding has the largest number of online platforms and is the fastest growing form (Kuppuswamy and Bayus, 2014). Our sample derives from backers who have funding experience on reward-based crowdfunding platforms in China; thus it is considered representative for the investigation factors influencing backers' funding intention in Asian countries.

Theoretically, the population to be studied should comprise all backers who have funding experience in China. However, due to the Personal Information Protection Act, access to all backers is prevented because of privacy concerns. Therefore, a non-probabilistic sampling procedure (i.e., convenience sampling)

Table 1 Reliability, correlation coefficients, and AVE results.

Construct	Cronbach's α	CR	AVE	TRU	PCV	PPI	PR	REC	FI
PPI	0.928	0.940	0.566	0.932					
PCV	0.936	0.937	0.832	-0.466	0.912				
TRU	0.964	0.964	0.869	0.377	-0.395	0.752			
PR	0.942	0.942	0.844	-0.480	0.653	-0.275	0.919		
REC	0.904	0.912	0.776	0.419	-0.426	0.432	-0.321	0.881	
FI	0.875	0.900	0.694	0.464	-0.535	0.354	-0.457	0.625	0.833

Notes: (1) The diagonal numbers in bold are the square root of AVE. (2) PPI: perceived product innovation; PCV: psychological contract violation; TRU: trust in crowdfunding platform; PR: perceived risk; REC: perceived reciprocity; FI: funding intention.



Notes:
 1. Solid arrow represents significant hypothesis; Dotted arrow represents non-significant hypothesis
 2. Significant levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$
 3. t -values for standardized path coefficients are described in parentheses.
 t -value $\geq 1.96^*$; t -value $\geq 2.58^{**}$; t -value $\geq 3.29^{***}$

Fig. 2. Results of path analysis.

was used to collect the data in this study. A questionnaire was posted on crowdfunding forums and discussion boards of main crowdfunding platforms from May 10 to July 11, 2018. To eliminate repeated responses, we removed responses with duplicate IP addresses (Zhao et al., 2017).

A total of 680 valid respondents were collected in this study. Of them, 53% were female, and 56% were aged between 31 and 50. Most of them received higher education (90% with a bachelor or graduate degree). All of the respondents had experience in funding a project on reward-based crowdfunding platforms. About 37% of them had funded twice, and 23% had even funded at least 3 times. Finally, half of them had spent more than RMB 500 (US\$73.1) on each fundraising project.

2. Measurement items

The measurement items in this study were adapted from prior literature and checked for reliability and validity. Items measuring perceived product innovation (PPI) were modified from Stock and Zacharias (2013). We developed the measurement of PCV and perceived risk (PR) from Pavlou and Gefen (2005). Measurement items for trust in crowdfunding platform

(TR) were modified from De Wulf et al. (2001). To measure the concept of perceived reciprocity (PRE), we used items from Wu et al. (2008). Our study used items from Ponte et al. (2015) to measure the concept of funding intention. Measurement items for involvement (INV) were modified from Choo et al. (2014). A 7-point Likert scale format rating from 1 (strongly disagree) to 7 (strongly agree) was used for all items. A list of the items is displayed in the Appendix.

IV DATA ANALYSIS AND RESULTS

1. Measurement model

This study followed the two-step procedure suggested by Anderson and Gerbing (1988) to analyze the collected data. First, confirmatory factor analysis (CFA) was conducted to test the measurement theory based on the overall model fit, construct reliability and validity. After that, a structural model was used to examine the structural relationships among the constructs. The CFA result indicated that the measurement model fit the data well ($\chi^2/df=2.395$; CFI=0.971; GFI=0.922;

AGFI=0.904; RMSEA=0.045; SRMR=0.042; NFI=0.952) (Hair et al., 2010). To validate the survey instrument, we analyzed its convergent and discriminant validity. Convergent validity was evaluated by inspecting the standardized path loading, composite reliability (CR), Cronbach's α , and average variance extracted (AVE) (Gefen et al., 2000). Respecting the criteria recommended by Fornell and Larcker (1981), we evaluated the measurement scales following three criteria: (1) all indicator factor loadings should be significant and exceed 0.5; (2) construct reliabilities should exceed 0.8; and (3) AVE by each construct should exceed the variance due to measurement error for that construct (e.g., AVE should exceed 0.5). As shown in Appendix, all the factor loadings ranged from 0.679 to 0.935, exceeding 0.5, showing high convergent validity. Moreover, the CR of the constructs ranged from 0.900 to 0.964, exceeding the threshold value of 0.8 (Hair et al., 2010), indicating good reliability. The AVE, which ranged from 0.566 to 0.869, was greater than the variance due to measurement error (Table 1). All three conditions for convergent validity were met.

Furthermore, discriminant validity is the degree to which the measures of two constructs are empirically distinct (Bagozzi et al., 1991). When the square root of each construct's AVE is larger than its correlations with other constructs, discriminant validity is supported. As shown in Table 1, the highest correlation between any pair of constructs was 0.653, which was between the PCV and PR. This figure was lower than the lowest square root of AVE among all constructs, which was 0.752 for perceived product innovation (PPI) and trust in crowdfunding platform (TRU). Therefore, the square root of AVE for each construct exceeded the correlations between the given construct and others. Hence, discriminant validity of the instrument was supported.

2. Structural model

AMOS 19 was employed to test the structural model and the model fit indices ($\chi^2/df=2.519$; CFI=0.969; GFI=0.919; AGFI=0.901; RMSEA=0.049; SRMR=0.051; NFI=0.949) indicate a good model fit. Then this study evaluated the structural model to examine the hypothesized relationships. As shown in Fig. 2, the outcomes show the standardized path coefficients are statistically significant, supporting the proposed hypotheses.

3. Hypothesis testing

Fig. 2 illustrates the result of the structural model analysis, including the R^2 and standardized path coefficients for all hypothesized relationships. The relationship between PCV ($\beta=0.56^{***}$, t -value=14.189), trust in crowdfunding platform ($\beta=-0.23^{***}$, t -value=6.388) and perceived risk are significant; however the relationship between perceived product innovation and perceived risk was not significant ($\beta=0.03$, t -value=0.957). Therefore, H_3 and H_5 were supported and H_1 was not. These antecedents explained 47% of the variance in perceived risk, with PCV contributing the largest proportion.

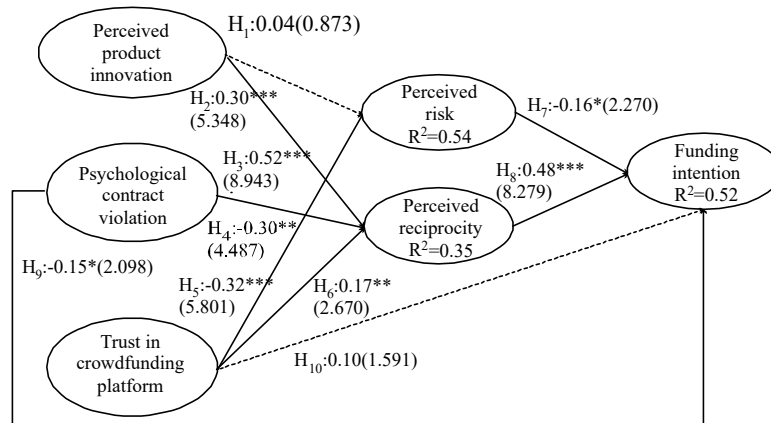
All the relationship between perceived product innovation ($\beta=0.27^{***}$, t -value=6.538), PCV ($\beta=-0.22^{***}$, t -value=5.168), trust in crowdfunding platform ($\beta=0.22^{***}$, t -value=5.247) and perceived reciprocity were significant (supporting H_2 , H_4 and H_6). These antecedents explained 30% of the variance in perceived reciprocity, with perceived product innovation contributing the largest proportion. Perceived risk ($\beta=-0.12^{**}$, t -value=2.639), perceived reciprocity ($\beta=0.45^{***}$, t -value=11.547), PCV ($\beta=-0.21^{***}$, t -value=4.589) and trust in crowdfunding platform ($\beta=0.12^{**}$, t -value=3.204) significantly affected funding intention, explaining the large variance of funding intention ($R^2=0.50$). Hence, H_7 , H_8 , H_9 and H_{10} were supported.

V. DISCUSSION AND IMPLICATIONS

1. Discussion of findings

In this study, we found that perceived reciprocity was the most important factor ($\beta=0.45^{***}$, t -value=11.547) influencing backers' funding intention. When backers strongly feel that proposers have made great efforts to provide products with innovative designs and unique functions, the backers will reciprocate by helping the proposers. The stronger they feel the perception of reciprocal obligation, the higher the backers' funding intention (H_8). Our findings are consistent with the findings of Wu et al. (2008) indicating that perceived reciprocity of consumers had significant effect on their future purchase intention in the context of printer product category. This suggests that crowdfunding proposers and platform administrators should build on increasing backers' perceived reciprocity as a starting point in project design, promotion and communication with backers.

We also demonstrate that PCV was the second key variable ($\beta=-0.421^{***}$, t -value=4.589) influencing backers' funding intention. In particular, PCV not only had significant and direct effect on backers' funding intention (H_9), but also affected funding intentions through perceived risk and reciprocity. That is, PCV increased backers' perceived risk ($\beta=0.56^{***}$, t -value=14.189) (H_3), which further influenced funding intention ($\beta=-0.12^{**}$, t -value=2.639) (H_7). This result is consistent with the finding of Pavlou and Gefen (2005) which verified PCV as a critical factor in buyer-seller relationship with PCV directly affecting buyer transaction intention and having indirect effect on transaction intention via perceived risk. Meanwhile, perceived reciprocity mediated backers' perception of PCV and their funding intention. In this study, PCV was found to have decreased backers' perception of reciprocal benefits ($\beta=-0.22^{***}$, t -value=5.168) (H_4), which further influenced their funding intention ($\beta=0.45^{***}$, t -value=11.547) (H_8). According to the findings of Pavlou and Gefen (2005), buyers with a higher degree of PCV are more likely to perceive less utility from their transactions; therefore, these buyers would be less willing to offer a price premium to sellers. Thus, our findings verified the necessity of extending PCV to crowdfunding.



Notes:
 1. Solid arrow represents significant hypothesis; Dotted arrow represents non-significant hypothesis
 2. Significant levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$
 3. t -values for standardized path coefficients are described in parentheses.
 t -value $\geq 1.96^*$; t -value $\geq 2.58^{**}$; t -value $\geq 3.29^{***}$

Fig. A1. Path analysis (high-involvement, $n=401$).

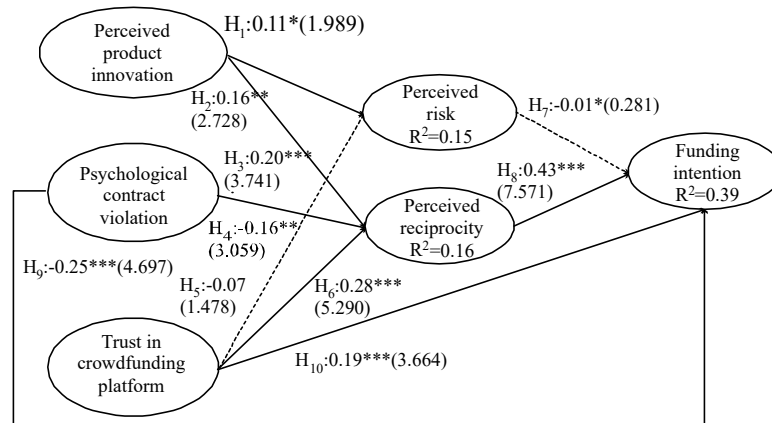
Moreover, this research indicated that backers' trust in a crowdfunding platform is the third important factor ($\beta=0.12^{**}$, t -value=3.204) which affects their funding intention (H_{10}). This echoes the findings of Chiu et al. (2013) and Pavlou and Gefen (2004) showing that trust in an online store had a direct effect on consumer purchase intention. Previous studies had considered investors as consumers (Ordanini et al., 2011); therefore, in the context of crowdfunding, backers' funding intention would be analogous to consumer purchase intention. When backers' perception of trust in a crowdfunding platform is higher, the more they believe that the platform will use corresponding mechanisms to constrain the opportunism of proposers, and have confidence in the quality of products they will receive and in timely delivery. Thus, a sense of trust in crowdfunding platforms is very important in influencing backers' funding intention. Finally, we also found that perceived risk had significantly negative effect ($\beta=-0.12^{**}$, t -value=2.639) on backers' funding intention (H_7). This is consistent with the finding of Matic and Vojvodic (2015) that perceived risk would negatively affect a Generation-Y consumer's willingness to shop online.

As mentioned, perceived reciprocity and PCV are the most important factors leading to backers' funding intention. Thus, crowdfunding proposers and platform administrators should increase perceived reciprocity of backers in designing and promoting projects, strengthen platform-based trust and punishment mechanisms to decrease backers' perceived risk, and mitigate the impact of PCV on backers' future funding behavior. For perceived reciprocity, we found that backers' perceived product innovation and trust in crowdfunding platforms had significantly positive effect on backers' reciprocity while PCV had negative effect on perceived reciprocity. In particular, this

research indicated that perceived product innovation ($\beta=0.27^{***}$, t -value=6.538) is the most important antecedent of perceived reciprocity (H_2), followed by trust in crowdfunding platform ($\beta=0.22^{***}$, t -value=5.247) (H_6). Therefore, when backers perceive the product of a crowdfunding project to be innovative and realize that the proposers have exerted great efforts to provide high-quality products, they will have greater reciprocal intention to repay the proposers. In addition, their trust in the platform will enhance their reciprocal intention. For example, the reputation, proponent review mechanism, and refund mechanism of the platform will strengthen the expectations of backers for receiving innovative and high-quality products in the future, thereby increasing their willingness to establish mutually beneficial relationships with the proposers.

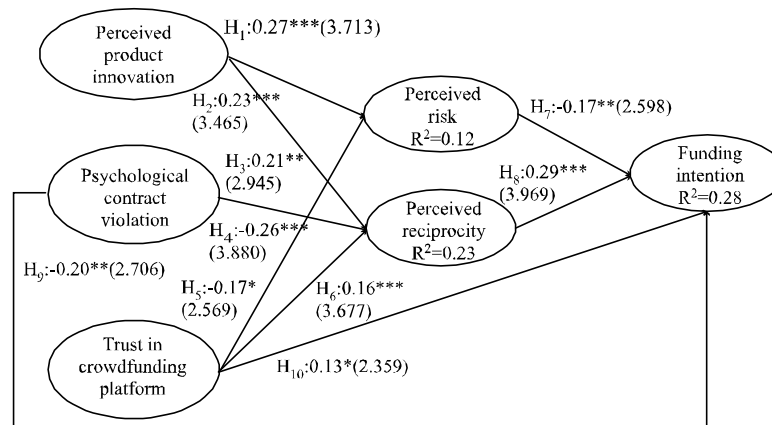
For the construct of perceived risk, this research found PCV having significantly positive impact on backers' perceived risk ($\beta = 0.56^{***}$, t -value=14.189) (H_3), while trust in the platform has a significantly negative impact on perceived risk ($\beta = -0.23^{***}$, t -value=6.388) (H_5). It shows that breach of promise by proposers and dishonest behavior during project implementation will significantly increase the perceived risk of backers when funding projects. In addition, trust in the crowdfunding platform can be converted into overall trust for backers in the crowdfunding proposers.

Despite that, the impact of perceived product innovation on perceived risk is not significant ($\beta=0.03$, t -value=0.957) (H_1). Previous studies have drawn two distinct conclusions about the relationship between product innovation and perceived risk. Some studies concluded that the barriers to use new products would increase the technological risks to consumers and, consequently, they would refuse to buy or use innovative products,



Notes:
 1. Solid arrow represents significant hypothesis; Dotted arrow represents non-significant hypothesis
 2. Significant levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$
 3. *t*-values for standardized path coefficients are described in parentheses.
 t -value $\geq 1.96^*$; t -value $\geq 2.58^{**}$; t -value $\geq 3.29^{***}$

Fig. A2. Path analysis (low-involvement, n=279).



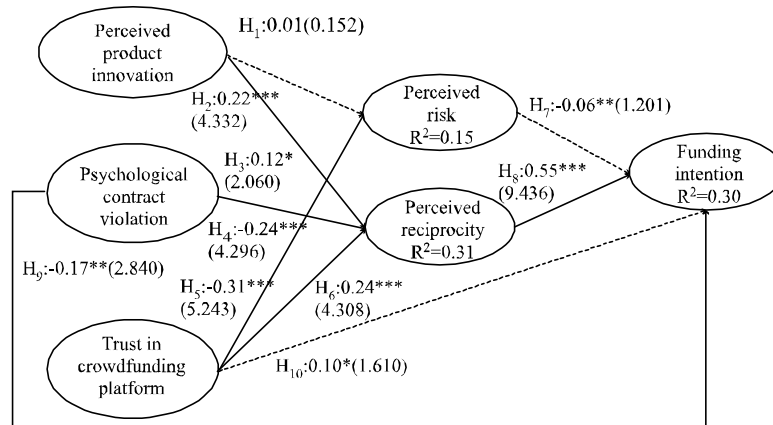
Notes:
 1. Solid arrow represents significant hypothesis; Dotted arrow represents non-significant hypothesis
 2. Significant levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$
 3. *t*-values for standardized path coefficients are described in parentheses.
 t -value $\leq 1.96^*$; t -value $\leq 2.58^{**}$; t -value $\leq 3.29^{***}$

Fig. A3. Path analysis (funding time=1, n=269).

so-called innovation resistance (e.g., Forster et al., 2010). However, other studies indicated that product innovation could reduce perceived risk of consumers regarding new products. This is because innovative products can improve the inadequacies of the products already experienced by users, in turn reducing the perceived risk (Jung et al., 2014). Hence, this study infers that, for H_1 , the insignificant relationship between perceived product innovation and perceived risk may result from a moderating effect. Thus, we conducted a multi-group analysis for our research framework to uncover deeper insights.

First, insignificant support for hypothesis (H_1) may result from the moderating effect of different levels of product involvement. According to Hoyer et al. (2011), product involvement is the extent of relevance of a product to an individual,

including the importance that customers attribute to a product, and their understanding of the product. Previous studies have indicated that involvement and risk are closely related. Venkatraman (1989) indicated that the reason customers get involved with a product is the enjoyment brought by the product, or their hope of obtaining expertise related to the product. When customers intend to avoid purchasing bad products, they tend to spend more effort in getting familiar with the product to reduce their purchase risk (Hong and Cho, 2011). But, in the crowdfunding context, Zhao et al. (2017) found that backer involvement is negatively associated with perceived risk. When backers are attracted to a product or believe that the product is important and valuable, they tend to spend more effort to know the product to reduce their anxiety. If backers have more



Notes:
 1. Solid arrow represents significant hypothesis; Dotted arrow represents non-significant hypothesis
 2. Significant levels: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$
 3. t -values for standardized path coefficients are described in parentheses.
 t -value $\leq 1.96^*$; t -value $\leq 2.58^{**}$; t -value $\leq 3.29^{***}$

Fig. A4. Path analysis (funding times ≥ 2 , $n=411$).

knowledge of the product, then their uncertainty of the product decreases. Thus, in this study, a grouped test using different levels of involvement (high-involvement vs. low-involvement) was conducted. It demonstrated that in the high-involvement group, perceived product innovation was found to have an insignificant effect on perceived risk ($\beta = 0.04$, t -value=0.873) (Fig. A1).

However, perceived product innovation was found to have a significantly positive effect on perceived risk ($\beta = 0.11^*$, t -value=1.989) (Fig. A2), indicating that backers with insufficient knowledge of innovative products would feel greater uncertainty. This uncertainty is often the source of their perceived risk and may affect their perception of the company and the product (Hong and Cho, 2011).

In addition, the insignificant support for hypothesis (H_1) could result from backers' different funding experiences. For the group with less funding experience (i.e., only once), perceived product innovation was found to have a significantly positive impact on perceived risk (Fig. A3). For the group with more funding experiences (at least 2 times), perceived product innovation was found to have insignificant effect on perceived risk ($\beta = 0.01$, t -value=0.152) (Fig. A4). In summary, when designing crowdfunding projects, if proposers overemphasize the innovative technology used in the product and the distinctive features that separate it from other products on the market, potential backers (e.g. backers with low involvement or limited funding experiences) may be concerned about the final realization of crowdfunding project products, which will then increase their perceived risk and lower their funding intention when funding a project.

2. Theoretical implications

This study contributes to the literature in three ways. First,

we have demonstrated the necessity to extend the PCV concept to crowdfunding. PCV has been studied primarily in the context of organizational relationships; however, the negative effect of PCV on the backer-proposer relationship within the crowdfunding context is still not well understood. The integration of PCV in the research framework of this study could provide a better understanding of the backer-proposer relationship within the crowdfunding context. Second, more than 75% of crowdfunded projects were found to have delayed product delivery or to have ultimately failed to deliver the product as promised. The success rate of crowdfunding projects on most platforms is lower than 50% and has been decreasing in recent years. Thus, understanding what affects backers' funding intention becomes compelling. This study indicates that backers' perceived reciprocity is the most important factor in increasing funding intention, and also helps decrease the negative effect of PCV on funding intention. Thus, the results of this study provide a new explanation for backers' willingness to invest when PCV occurs frequently in the crowdfunding context. We expect these findings to provide a meaningful suggestion to crowdfunding platform administrators and proposers that fostering a reciprocal relationship is important in decreasing the negative effect of PCV and increasing backers' funding intention. Third, this research also conducted a multi-group analysis for finding deeper insights. When grouped testing was performed based on involvement and funding experience, the findings indicate that low involvement or the group with two or fewer funding experiences was stimulated by perceived product innovation with increased perceived risk. Meanwhile, in high involvement or the group with more than two funding experiences, the influence of perceived product innovation and perceived risk was not significant. This finding can provide an explanation for the non-significant effect of perceived product

innovation on perceived risk in crowdfunding.

3. Managerial implications

This study also provides relevant insights for managers. Crowdfunding has become popular around the world. Therefore, for managers and project proposers of crowdfunding platforms, the aim of presenting fundraising projects on these platforms is not to attract a large number of viewers but to turn these viewers into backers. Thus, this study mainly focuses on discussing factors influencing backers' funding intention by analyzing the effects of project-related factors, platform-related factors, and the dishonesty issues during project implementation (i.e., PCV) on backers' attitudes and subsequent behaviors. Based on the overall model, we found that backers' perceived reciprocity and PCV are the most important factors affecting funding intention; and PCV will influence their funding intention through perceived reciprocity and perceived risk. To enhance funding intention, therefore, this study suggests that actions be taken to increase the level of perceived reciprocity and reduce the perceived risk. The following practical insights or contributions provided by this study can serve as practical guidelines to prescribe how perceived reciprocity can be increased and PCV can be reduced.

In terms of improving backers' perceived reciprocity, the overall model suggests that perceived product innovation and trust in the crowdfunding platform both have a significantly positive impact on reciprocity, whereas PCV has a negative impact on the same. Therefore, to increase the perceived reciprocity, emphasis should be placed on the benefits brought to the backers by product innovation and the trust-related mechanism of the platform. In addition, as PCV would negatively affect the degree of reciprocity, it is recommended that crowdfunding platforms should strengthen the qualification review of project proposers and link their dishonest behavior to a national credit system, so as to prevent their opportunistic behavior. Second, PCV also results from the gap in backer understanding of project products (i.e., incongruence). Therefore, it is especially important to strengthen the communication between proposers and potential backers. For example, a Q&A section and even a real-time online communication system similar to ones on e-commerce platforms, such as Taobao's AliWangWang chat tool, could be set up on the websites of crowdfunding projects. Through the chat tool, customers can easily ask sellers various questions about products and services. If sellers can resolve the questions in a timely, patient, and polite manner, consumers will gain a better understanding about the product with a good impression of the seller's good manners, which will very likely be rewarded by a purchase.

When it comes to reducing PCV and strengthening backer trust in the crowdfunding platform, this study suggests that measures should be taken at least three levels—national regulations, platform governance, and crowdfunding projects—to regulate a healthy development of the industry, reduce the occurrence of PCV, and, thus, enhance backers' trust in the crowdfunding platform and participation in crowdfunding.

The more specific measures are as follows: First, at the national regulatory level, more efforts should be put into legislation. As crowdfunding is still an emerging activity, there are limited laws and regulations on crowdfunding promulgated by countries around the world. As a result, the current cost of contract default for crowdfunding proposers is relatively low, and a significant proportion of projects demonstrate contract defaults, such as delivery delays after successful fundraising. Therefore, this study suggests that legislation on the crowdfunding industry should be enacted as soon as possible to launch a series of laws and regulations on the operation of the industry and protect the legitimate rights and interests of all parties. Second, at the crowdfunding platform level, trust-related mechanisms (such as review, security, and refund mechanisms) should be improved to strengthen the management of the fundraising project implementation and restrain proposers' opportunistic behaviors. This serves to reduce the occurrence of PCV. Third, at the crowdfunding project level, proposers should demonstrate their competency by providing documentation related to their educational qualifications, patents held, social resources, successful management experience, and so forth, so as to enhance backers' trust in their ability as well as their positive expectation of receiving high-quality products in the future. These strategies could help reduce backers' perceived risk and increase their funding intention.

VI. LIMITATIONS AND FUTURE RESEARCH

Although this study has produced meaningful results, there are limitations to what can be accomplished in a single study. First, scholars should be cautious in generalizing the findings to other countries (e.g., US, Europe) since phenomena may vary in different cultures and institutional contexts. Thus, cross-cultural issues and comparisons between different types of crowdfunding platforms are suggested for future research. Furthermore, the types of fundraising projects are extensive, but this study focused only on projects related to innovative products. With an increasing number of event-type projects on crowdfunding platforms, future studies should include intangible objects (e.g., events or services). Finally, our data collection involved convenience sampling, and future research should use other methods such as sampling from crowdfunding platforms' databases of backers, which may provide a more accurate picture of backers' behaviors.

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APPENDIX

Scales and measures.

Construct	Adapted Scale	Scale Source	Standardized loading
Perceived Product Innovation	Most crowdfunding products are novel.	Stock and Zacharisa (2013)	0.679
	Most crowdfunding products are inventive.		0.737
	Most crowdfunding products differ significantly in terms of their newness from existing products on the market.		0.734
	Most crowdfunding products are exceptional.		0.789
	Most crowdfunding products are not predictable.		0.720
	Most crowdfunding products offer unique advantages to me.		0.709
	Most crowdfunding products offer higher quality than existing products.		0.766
	Most crowdfunding products offer higher value than existing products.		0.760
	Most crowdfunding products can solve problems.		0.714
	Most crowdfunding products lead to significant cost saving.		0.838
	Most crowdfunding products are supportive to simplify users' processes.		0.756
Most crowdfunding products deliver high benefits for users.	0.808		
Psychological contract violation	In general, the probability of project proposers fail to meet their contractual obligations is high.	Pavlou and Gefen (2005)	0.914
	In general, the probability of project proposers do a good job of meeting their contractual obligations is high.		0.928
	In general, the probability of project proposers fail to fulfill the most important contractual obligations is high.		0.895
Trust in crowdfunding platform	Crowdfunding platforms as legal and popular platforms give me a feeling of trust.	De Wulf et al. (2001)	0.934
	I have trust in crowdfunding platforms.		0.933
	Crowdfunding platforms give me a trustworthy impression.		0.935
	I believe crowdfunding platforms will keep its promises and commitments.		0.927
Perceived risk	There is a considerable risk involved in funding projects on crowdfunding platforms.	Pavlou and Gefen (2005)	0.922
	There is a high potential for loss involved in funding projects on crowdfunding platforms.		0.928
	My decision to fund on a project on crowdfunding platforms is risky.		0.906
Perceived reciprocity	I hope that the project proposers can offer me products as they promised.	Wu et al. (2008)	0.782
	I am willing to give money to project proposers so that I can get the product I want.		0.928
	I am willing to cooperate with the project proposers.		0.924

Funding Intention	The probability that I would consider to fund a crowdfunding project is high.	Ponte et al. (2015)	0.834
	If I were to fund a project, I would consider to fund on these crowdfunding platforms.		0.745
	The likelihood of my funding to a crowdfunding project from these platforms is high.		0.870
	My willingness to fund a crowdfunding project from these platforms is high.		0.877