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Investigating factors influencing the continuity of financial technology usage: The case of Indonesia

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ABSTRACT

This study aims to investigate the factors that influence the continuity of fintech usage by taking Indonesia as a case. Factors that drive the continuity of fintech usage are perceived benefit, perceived risk, perceived ease of use, and perceived usefulness with fintech usage adoption as a mediating variable. Data was obtained from 343 fintech users located in Indonesia. These data were then analyzed by applying the Structural Equation Modelling (SEM). The results indicate that perceived benefit and usefulness positively and significantly affect the adoption and the continuity of fintech usage. However, the perceived risk and ease of use have no significant effect on the adoption and the continuity of fintech usage. Additionally, fintech usage adoption positively and significantly influences the continuity of fintech usage. Fintech usage adoption mediates the effects of perceived benefits and usefulness on fintech usage continuity but does not mediate the influence of perceived risk and ease of use on the continuity of fintech usage. The findings contribute to the knowledge of the perceived benefit and usefulness for users to adopt and continue fintech usage. The government needs to continue improving digital financial literacy to aware users of fintech.

Contribution/Originality: This study differs from the previous studies advanced in the literature as we utilize fintech usage adoption as a mediating variable and examine the direct relationship between fintech usage adoption and the continuity of fintech usage.

1. INTRODUCTION

Financial technology (fintech) refers to the integration of financial services with technological developments, facilitating consumer access to innovative financial solutions such as savings and investments, online payments, financial planning, peer-to-peer lending, mobile financial services and crowdfunding (Dorfleitner, Hornuf, Schmitt, & Weber, 2017; Knewtson & Rosenbaum, 2020; Liu, Chan, & Chimhundu, 2024; Mamonov, 2020; Schueffel, 2016; Shao, Zhang, Li, & Guo, 2019). This payment technology is essential for the advancement of financial inclusion and economic growth in the global world including in Indonesia (La Rocca, 2024; Mardiana, Faridatul, Herlindawati, Tiara, & Mardiyana, 2020; Razzaque, Cummings, Karolak, & Hamdan, 2020; Wang, Guan, Hou, Li, & Zhou, 2019; Wonglimpiyarat, 2011). Fintech services can facilitate access to financial services and promote greater economic inclusive participation (Lasmini & Zulvia, 2021; Muzdalifa, Rahma, Novalia, & Rafsanjani, 2018).

The Indonesian Fintech Association (AFTECH) in 2023 indicated a growing demand for digital financial services in Indonesia, particularly among individuals aged 26 to 35 years (Asosiasi Fintech Indonesia, 2024). Notable companies in Indonesia offering fintech services include OVO, Gopay, Dana, Shopeepay, Linkaja, paylater, Doku, and Bareksa. These companies offer innovative solutions in financial transactions, payments, lending, investment, and other financial services, thereby modernizing the sector, generating new job opportunities, and attracting foreign investment (Kumar, Wong, Chauhan, Shubhankar, & Oetama, 2023; Nurhayani, Dongoran, Syah, & Sagala, 2024; Sekarningrum, 2022).

Recognizing the above potential of fintech for the economy, the government of Indonesia (GOI) through the Financial Services Authority, locally called Otoritas Jasa Keuangan (OJK) created a supportive ecosystem including regulations and appointed the Indonesian Fintech Association (AFTECH) as the organizer of digital financial expansion (Irso, 2023; Otoritas, 2024). The task of this organization is to ensure the development of fintech to enhance financial inclusion, strengthen the financial sector and foster inclusive and sustainable economic growth (Otoritas, 2024).

However, the present development of the fintech industry faces challenges such as data security and low financial literacy of its users. These challenges consequently affect consumers' and users' trust and the sustainable usage of fintech services (Sahroni, Santiago, & Redi, 2023). Data security is an important concern as it is essential to protect the integrity and confidentiality of consumers' financial information. Additional challenges encompass consumer protection, suitable regulation and disparities in technology access across various segments of society (Cahyadi, Tarigan, Masman, Trisnawati, & Wijaya, 2024). The recent data indicate that there is a decline in the fintech industry services. The total assets of peer-to-peer (P2P) lending services dropped by 5% in the fourth quarter of 2023. There was a 3.24% decline in the number of online loan accounts in November 2023 (Annur, 2024; Saputra, 2024). Global investments in fintech showed a sharp decrease of investment from US$ 88.8 billion (2022) to US$ 46.3 billion (2023) and the total number of transactions in fintech fell from 7,515 in 2022 to 4,547 in 2023 hitting the lowest levels since 2017 (Ruddenklau, 2024). These declining trends raise concerns about the future sustainability of fintech usage. Therefore, for this reason, there is an urgent need for further research particularly to analyze the factors behind these declines, identify the challenges faced by the industry and develop policies to ensure the sustainability and growth of the fintech sector.

There have been many studies advanced in the literature investigating factors that affect fintech usage continuity. For instance, Jain and Raman (2023) found that the perceived benefits factor significantly influences the continuity of fintech usage. This finding was further confirmed by Alkadi and Abed (2023); Razzaque et al. (2020); Akturan and Tezcan (2012); Gao and Bai (2014); Hu, Ding, Li, Chen, and Yang (2019) and Ming and Jais (2022). The primary reason that perceived benefits affect the continued use of fintech is that users recognize fintech as offering economic advantages, facilitating seamless transactions and providing convenience. The economic advantage relates to the equilibrium between reduced financial expenses and the financial benefits derived from the utilization of fintech. A seamless transaction represents an improved process in which consumers engage in swift transactions facilitated by accessible and sophisticated financial service platforms, thereby integrating the fields of financial institutions and information technology (Alkadi & Abed, 2023; Razzaque et al., 2020).

In addition to the perceived benefits, perceived risk factors, especially legal risks significantly influence the continued use of fintech. The perceived risk encompasses the possibility of data loss and the uncertainties linked to the adoption of new technology (Gefen, Srinivasan Rao, & Tractinsky, 2003; Hutapea & Wijaya, 2021; Li, Khaliq, Chinove, Khaliq, & Oláh, 2023; Tang, Ooi, & Chong, 2020; Zhang & Yu, 2020). According to Hutapea and Wijaya (2021); Li et al. (2023) and Tang et al. (2020) the categories of perceived risk associated with fintech are as follows: (1) security risk which pertains to the protection of personal data and transactions from threats such as hacking, data theft, or misuse. (2) Financial risk which concerns potential monetary losses arising from hidden costs, fraud, or transaction discrepancies. (3) Performance risk which relates to the service's inability to meet expectations,

including system malfunctions or transaction problems. (4) Privacy risk which involves the possible misuse of personal information such as identity and transaction details. (5) Legal risk which is connected to uncertainties regarding regulations and legal protections for users of fintech services.

Among these risk categories, financial and security risks have an adverse impact on the intent to consistently utilize fintech services (Abd Malik & Syed Annuar, 2019; Diana & Leon, 2020; Forsythe, Liu, Shannon, & Gardner, 2006; Gerlach & Lutz, 2019; Mufarih, Jayadi, & Sugandi, 2020; Putritama, 2019; Tanadi, Samadi, & Gharleghi, 2015). As a result, perceived benefits enhance retention whereas perceived risks, especially among female users, might reduce the intention (Nurlaily, Aini, & Asmoro, 2021). Customers tend to interact with a service when they perceive that the advantages outweigh the associated risks (Ryu, 2018).

According to Bergmann, Maçada, de Oliveira Santini, and Rasul (2023) besides perceived benefits and perceived risks, the continuation of fintech is influenced by its perceived ease of use and perceived usefulness. However, these two factors influence the persistence of fintech when mediated by user satisfaction and trust. Furthermore, it was found that in Western countries, satisfaction plays a significant role in the continued use of fintech which is marked by high human development index levels and greater use of electronic payments. Among these two factors, the perceived ease of use is identified as the primary driver of continued fintech usage (Davis, 1989; Hu et al., 2019; Kanchanatanee, Suwanno, & Jarernvongrayab, 2014; Niu, Wang, & Zhou, 2022; Nugraha, Setiawan, Nathan, & Fekete-Farkas, 2022; Pambudi, Roswinanto, & Meiria, 2023). Studies that addressed the importance of perceived usefulness include the works of Bangkara and Mimba (2016); Davis (1985); Gao and Bai (2014); Hu et al. (2019); Jangir, Sharma, Taneja, and Rupeika-Apoga (2022) and Mufarih et al. (2020). Bangkara and Mimba (2016) and Mufarih et al. (2020) show that if users perceive fintech as user-friendly, they are more likely to continue using it. The perceived ease of use and perceived usefulness are essential factors influencing fintech users' decisions to continue utilizing fintech services. However, perceived benefits, risks, ease of use, and usefulness also affect the adoption of fintech usage. Studies that confirm a direct relationship between perceived benefits and fintech usage adoption include Davis (1985); Davis (1989); Gan and Wang (2017); Banna, Hassan, Ahmad, and Alam (2022); Hassan et al. (2022); Mascarenhas, Perpétuo, Barrote, and Perides (2021); Ryu (2018) and Sari (2022).

While previous studies that validated the connection between the perceived risk and fintech services adoption were Ali, Raza, Khamis, Puah, and Amin (2021); Chan, Troshani, Rao Hill, and Hoffmann (2022); Diana and Leon (2020); Hassan et al. (2022); Abd Malik and Syed Annuar (2019) and Ming and Jais (2022). These studies confirmed that perceived risk can negatively affect the intent to adopt fintech.

Furthermore, studies that showed the perceived ease of use is a crucial determinant in the adoption of fintech services were conducted by Sum Chau and Ngai (2010) and Akturan and Tezcan (2012) to name just two studies. However, the perceived ease of use significantly impacts the adoption of fintech services though its effect may be less pronounced compared to the perceived usefulness (Kesharwani & Singh Bisht, 2012; Shaw, 2014; Venkatesh & Davis, 2000).

Next, studies that showed the perceived usefulness directly influence fintech adoption were undertaken by Purwantini and Anisa (2021) and Nugraha et al. (2022). Purwantini and Anisa (2021) pointed out that the practicality of a technology system substantially impacts an individual's choice to use it continuously. Users are more inclined to technology adoption when they perceive it and they will enhance their tasks efficiently. In the world of fintech, this entails accelerating transactions while mitigating the risk of inaccuracies.

Based on the above previous studies, it can be confirmed that perceived benefit, perceived risk, perceived ease of use, and perceived usefulness influence the continuity of fintech usage. However, the previous studies have weaknesses in examining the effect of the fintech usage adoption on the fintech usage continuity. Additionally, the previous studies are not entirely conclusive in examining significant factors influencing the fintech usage adoption and the fintech usage continuity. Therefore, this study not only bridges the above research gap but more

importantly highlights factors that need to be given attention in determining the fintech adoption and the continuity of fintech usage to mitigate the declining phenomenon of the development of the fintech industry.

This study is ordered in the following structures: in section 2, we highlight the theoretical background that supports the proposed research model, variable relationships and hypothesis. In Section 3, we elaborate in detail on the source of data and methods of data analysis for evaluating the proposed framework. Section 4 addresses the results and discusses the results of the study derived from the analytical data analysis subject to research questions. Finally, we draw conclusions, policy implications and limitations of this study.

2. LITERATURE REVIEW

2.1. Theoretical Framework

As discussed in the introduction, previous studies indicated that fintech usage continuity is directly related to perceived benefits, perceived ease of use, perceived risks, and perceived usefulness. These four factors are also directly related to the adoption of fintech usage (Bergmann et al., 2023). The adoption of fintech usage is closely linked to the fintech usage continuity (Hu et al., 2019; Kim, Kim, Lee, & Kim, 2019; Nurlaily et al., 2021; Putritama, 2019; Roh, Park, & Xiao, 2023; Ryu, 2018). The theoretical framework that supports these studies is the theory of Reasoned Action (TRA) advanced by Ajzen and Fishbein (1977) and the theory of the Technology Acceptance Model (TAM) highlighted by Venkatesh and Davis (2000). These studies accommodate these two basic theories since TRA explains how a person's behavior is determined by their intention to perform that behavior which in turn is influenced by two main factors, namely attitude towards behavior and subjective norm (Ajzen & Fishbein, 1977). TAM postulates that the acceptance of technology is predicted by the users' behavioral intention which is determined by the perception of technology's usefulness in performing the task and the perceived ease of its use (Venkatesh & Davis, 2000). Therefore, TRA and TAM are applied to examine variables in the research model.

However, recent studies reveal that TRA and TAM have limitations (Ajibade, 2018). The TAM can elucidate individual adoption choices. However, it inadequately addresses the complexities involved in organizational adoption where elements such as regulatory compliance, operational integration and systemic risks are significant factors (Ajibade, 2018). Both theories fail to address social influences, facilitating conditions and behavioral uncertainty resulting in notable gaps when applied to complex fintech ecosystems (Saadah & Setiawan, 2024). These indicate the necessity for creating more comprehensive theoretical models that can more effectively consider individual and institutional factors in the continuity of fintech usage.

2.2. Variables Relationship and Hypothesis Development

Studies that examined the influence of the perceived benefit of fintech adoption have been undertaken by Mascarenhas et al. (2021) and Ryu (2018). These studies suggest that the fintech users' benefits received from fintech services increased fintech usage adoption. These benefits include ease of transactions, cost efficiency, and improved financial accessibility. These findings correspond with the Technology Acceptance Model (TAM), asserting that greater perceived benefits could promote users' intentions and behaviors toward adopting fintech. These findings were also supported by Gan and Wang (2017); Hassan et al. (2022) and Sari (2022) since they found a positive correlation between perceived benefits and the intent to utilize digital applications. Following these studies, we hypothesize that

H_1: Perceived benefit positively and significantly affects the fintech usage adoption.

The perceived ease of use is also a critical factor in the fintech service adoption influencing users' interaction with the technology used (Sum Chau & Ngai, 2010). However, Venkatesh and Davis (2000) argued that although perceived ease of use is essential, its impact may differ compared to perceived usefulness. The perceived ease of use includes a straightforward payment method, accessible customer service, and simple transactions, which positively

influence the intention to adopt fintech (Akturan & Tezcan, 2012; Sum Chau & Ngai, 2010). Thus, we anticipate that

H_2: Perceived ease of use positively and significantly affects the adoption of fintech usage.

Perceived risk can adversely influence the intention to adopt fintech (Abd Malik & Syed Annuar, 2019; Ali et al., 2021; Chan et al., 2022; Diana & Leon, 2020; Hassan et al., 2022; Ming & Jais, 2022; Tang et al., 2020). These studies show that risks like data security issues and financial loss make consumers more aware and cautious, affecting their willingness to use fintech services. As a result, higher perceived risk usually leads to a lower intention to adopt these technologies. In light of this understanding, we assume that

H_3: Perceived risk negatively and significantly influences the adoption of fintech usage.

Purwantini and Anisa (2021) further remarked that the success rate of a technology system significantly influences a person's decision to continue using it. Users are more likely to adopt technology that helps them complete tasks more efficiently. In fintech, this means enabling transactions while reducing time and lowering the risk of errors.

The Technology Acceptance Model (TAM) states that perceived usefulness or the belief that a technology will enhance performance significantly influences the intention to use it (Davis, 1989). The study findings by Nugraha et al. (2022) show that the perceived usefulness directly affects the intention to adopt fintech. Research on consumer behavior indicates that people who see a system as beneficial are more likely to adopt fintech services (Akturan & Tezcan, 2012; Gao & Bai, 2014; Hu et al., 2019; Ming & Jais, 2022). Therefore, we hypothesize that

H_4: Perceived usefulness positively and significantly influences fintech usage adoption.

The perceived benefit is crucial for the ongoing use of fintech services, as described by the Theory of Reasoned Action (TRA). This theory indicates that a positive view of perceived benefits, like transaction ease and economic gains enhance the intention to continue using the service. Research shows that perceived benefits, especially economic ones significantly influence the ongoing intention to use fintech services (Ajzen & Fishbein, 1977; Mascarenhas et al., 2021). Consequently, perceived benefit is crucial in influencing the intention and ongoing behavior of fintech users as delineated by TRA. Hence, we anticipate that

H_5: Perceived benefit positively and significantly affects fintech usage continuity.

The Theory of Reasoned Action (TRA) elaborates that a person's intent to behave is determined by the following two primary factors: the attitudes toward the behaviors and the subjective norms. The perceived ease of use is linked to the attitude towards behavior in the TRA concept. Users who perceive fintech services as user-friendly are inclined to develop a favorable disposition towards these services. Thereby, it enhances their intention to keep utilizing them (Irimia-Diéguez, Velicia-Martín, & Aguayo-Camacho, 2023; Sheppard, Hartwick, & Warshaw, 1988). The study findings by Wilson, Alvita, and Wibisono (2021) revealed that there is a positive correlation between perceived ease of use and repurchase intention. This conclusion is confirmed further by supplementary research which indicates that users who regard technology as user-friendly (easily used) have more inclination to have greater perceived ease of use and engage with it again (Ali et al., 2021; Amin, Rezaei, & Abolghasemi, 2014; Aren, Güzel, Kabadayı, & Alpkan, 2013; Kim, Galliers, Shin, Ryoo, & Kim, 2012; Lee & Charles, 2021; Meilatinova, 2021; Visakha & Keni, 2022). Therefore, we hypothesize that

H_6: Perceived ease of use positively and significantly influences fintech usage continuity.

The perceived risk substantially influences fintech usage continuity, as described by the Theory of Reasoned Action (TRA). Elevated perceived risks such as financial, legal, security, and operational risks, foster negative attitudes toward fintech services. Therefore, they diminish users' intention to continue utilizing them. Previous studies estimate that perceived risk undermines user trust and has a negative significant effect on the intent to use the continuity of fintech usage. Providers must mitigate the risks mentioned by implementing enhanced security measures, assurance of transparency and enhancement of user education to promote usage continuity (Ajzen & Fishbein, 1977; Mascarenhas et al., 2021; Purnama, Suryadi, & Andarwati, 2023). Therefore, we posit that

H_7: Perceived risk negatively and significantly influences the fintech usage continuity.

The Theory of Reasoned Action (TRA) by Ajzen and Fishbein (1977) claims that users' attitudes towards continued use of fintech services are related to perceived usefulness. TRA suggests that a person's attitude toward behavior and subjective norms create behavioral intention which influences actual behavior. When users see fintech services as helpful, they tend to maintain a positive view of continued use. A positive attitude and factors like social influence and environmental pressure increase the intention to keep using fintech services. Perceived usefulness is important for creating positive attitudes that promote continued use of fintech services. Previous research by Wen, Prybutok, and Xu (2011) and Wilson (2019) confirmed this further indicating a positive significant effect of perceived usefulness on the repurchase intention and the continuity of fintech usage. Thus, we make another hypothesis.

H_8: Perceived usefulness positively and significantly influences the continuity of fintech usage.

Fintech services are adopted based on their ongoing usage. The Theory of Reasoned Action (TRA) suggests that a person's intention to behave is shaped by their attitudes and the norms they perceive from others. Positive perceptions of the simplicity and benefits of fintech services with trust in social network support and encourage their initial adoption (Ajzen & Fishbein, 1977; Mahyarni, 2013; Nurlaily et al., 2021; Roh et al., 2023). TRA offers insights into the psychological and social determinants giving influence on initial adoption and continued utilization of fintech services (Ajzen, 1985; Chen, Chan, & Hashim, 2023; Nurlaily et al., 2021; Roh et al., 2023). Thus, we infer that

H_9: Fintech usage adoption positively and significantly affects fintech usage continuity.

Fintech adoption significantly impacts the link between perceived benefits and ongoing fintech usage. The Theory of Reasoned Action (TRA) suggests that the intention to use technology is shaped by attitudes, subjective norms, and perceived control over behavior. Positive views on benefits can increase the intention to use fintech services, encouraging their continued use. Research shows that subjective norms and perceived behavioral control can predict intentions and behaviors regarding fintech usage. They assist service providers in creating strategies to enhance adoption and continued use (Ajzen, 1985). According to this, the next hypothesis is as follows:

H_{10}: Fintech usage adoption mediates the effect of perceived benefit on the continuity of fintech usage.

Perceived ease of use is the comfort and confidence users have when using fintech services. Users are more likely to adopt fintech technology if they trust its use. This adoption results in ongoing use, as users perceive the technology as simple and advantageous over time. Studies indicate that how easily users find fintech services affect their intention to keep using them positively. It promotes adoption and ongoing use (Irimia-Diéguez et al., 2023; Nurhayani et al., 2024). The Theory of Reasoned Action (TRA) suggests that the intention to act is shaped by attitudes toward the action and subjective norms including the inclination to use fintech services (Ajzen, 1985; Ajzen & Fishbein, 1977). Based on this, the following hypothesis needs to be tested.

H_{11}: Fintech usage adoption mediates the perceived ease of use influence on the continuity of fintech usage.

The Theory of Reasoned Action (TRA) emphasizes how subjective norms and attitudes influence behavioral intentions. Positive views on fintech benefits and supportive social norms can reduce the negative effects of perceived risk and encourage ongoing use. Perceived behavioral control which includes the ability to manage risks and confidence in fintech service security can enhance the intention to continue using fintech services despite perceived risks (Ajzen, 1985; Ajzen & Fishbein, 1977; Nurlaily et al., 2021). Then, the next hypothesis is made as follows:

H_{12}: Fintech usage adoption mediates the influence of perceived risk on the continuity of fintech usage.

According to the Theory of Reasoned Action (TRA), the fintech services' perceived usefulness or the recognition of their benefits is pivotal. TRA posits that behavioral intentions are shaped by personal attitudes towards the behavior and prevailing subjective norms involving perceptions of the usefulness of using fintech services. Users exhibiting a positive disposition and robust intention to adopt fintech are inclined to sustain long-

term utilization of the service usage. This intention mediates the correlation between perceived usefulness and the continuity of fintech usage (Ajzen, 1985; Ajzen & Fishbein, 1977). Based on this, another hypothesis needs to be tested as follows:

H_{13}: Fintech usage adoption mediates the effect of perceived usefulness on the continuity of fintech usage.

2.3. Proposed Research Model

Considering the above theoretical framework and variable relationships, the proposed conceptual model in this study is illustrated in Figure 1.

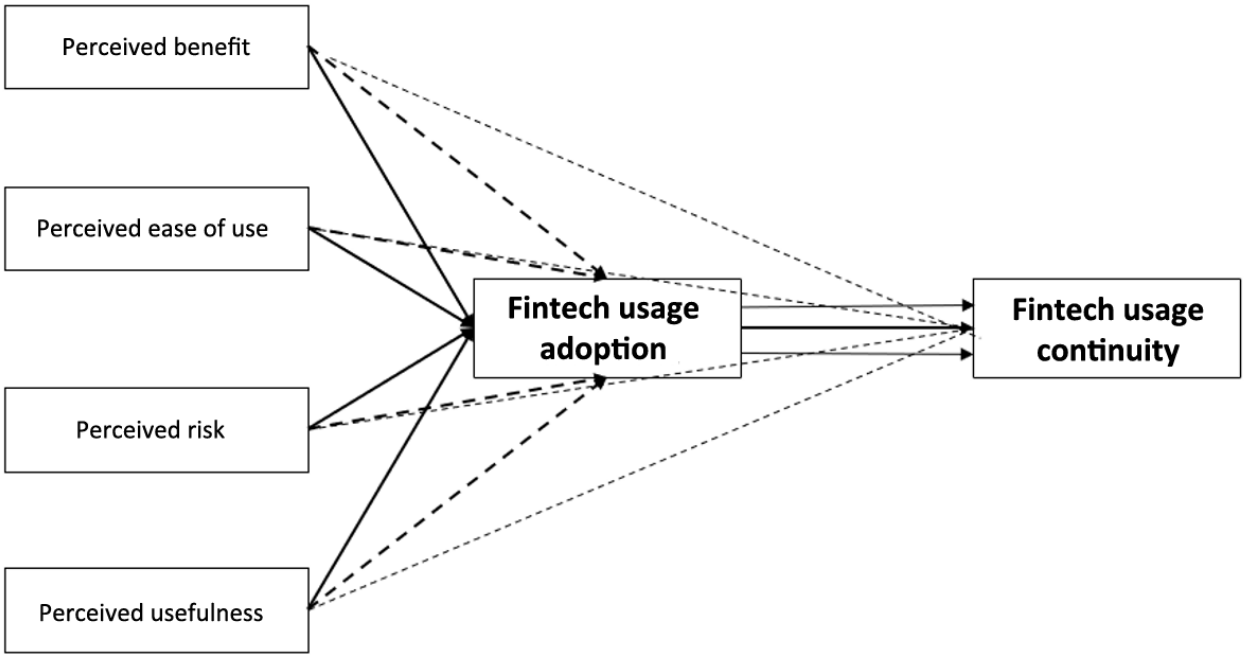

Figure 1. The research (Conceptual) model.

3. METHODS

3.1. The Research Design

The research design of this study briefly began by identifying the problem of fintech usage continuity and its urgency to conduct this study. After completing these parts, we then reviewed the previous empirical research to justify the variables and the model that were examined in the study. Then, we highlighted the research gap and the novelty of this study by comparing the variables used in this study with the variables used in the previous studies. These first steps aimed to justify the rationale of variables in the model examined in this study.

The next step was data collection. However, before data were collected, we determined the unit analysis, the research location, the source of data, the sampling method, and the instrument to collect the data. Finally, we analyzed the data. In the data analysis, we employed two types of data analysis methods. First, by applying the descriptive analysis method to address the characteristics of the respondents sampled under the study. Second, by employing the Structural Equation Model (SEM). The rationale for applying SEM was that this method was able to estimate variables that have multiple relationships. Similarly, SEM can estimate the relationship between unobserved variables and manifest variables or indicator variables (Hair, Hult, Ringle, & Sarstedt, 2022). For more details, the steps were as follows:

3.2. Data Collection and Sampling

Data was collected in the province of Jakarta. The reason to select this province was because Jakarta is the capital city of Indonesia and in this location fintech users and fintech services were dominant. We collected data

from March 2024 to June 2024. The rationale for this duration was partly because we assumed that we would be able to collect respondents by online questionnaire during these four months.

The unit of analysis of this study focused on users of fintech services, particularly OVO, Gopay, Dana, Shopeepay, Linkaja, and Paylater. These six fintech services were dominant in Jakarta. However, the number of the population of these six fintech users in Jakarta was unknown. As a result, we applied a non-probability sampling method to sample the fintech users of the six fintech services as respondents of this study.

To determine the number of respondents sampled, we followed Hair, Black, Anderson, and Babin (2010) as they suggested that the number of samples ideally in SEM needs to be from 15 to 20 observations for each exogenous variable. As there were 4 exogenous variables, there should be at least 60 respondents. By noting that suggestion, we collected 343 respondents under this study to avoid untruthful and strategic bias given by the respondents when they responded to the online questionnaire administered on Google Forms. The online questionnaire was given to 343 respondents covered questions related to 6 demographic characteristics (i.e., gender, age, highest education level, type of fintech service used, and frequency of use) and 33 indicators of all variables under the survey (see Table 2).

Furthermore, we used the Likert scale to measure indicators of each variable. This Likert scale used five response choices to indicate the agreement degree, trust or attitude of the respondents towards the given indicator statements or questions. Each respondent was asked to select an option that best reflects their opinions or attitude toward the statements or questions. We used a 1-5 Likert scale as follows: (1) strongly disagree that the respondent strongly disagree or has a negative attitude towards the statement or question posed. (2) Disagree that the respondent disagree or has a negative attitude towards the statement or question posed. (3) Neutral that respondent were neutral or did not have a specific attitude towards the statement or question posed. (4) Agree where respondents agree or have a positive attitude towards the statements or questions posed; and (5) strongly agree that the respondent exhibits strong agreement or has a very positive attitude towards the statement or question posed.

3.3. Variables Estimated and Method of Data Analysis

Variables estimated consist of one dependent and four independent variables with one mediating variable. Fintech usage continuity serves as the dependent variable used in this study whereas the independent variables are perceived benefit, perceived ease of use, perceived usefulness, and perceived risks. The mediating variable used in this study is fintech usage adoption. This study selected variables for fintech usage continuity and adoption based on the TRA and TAM models as these variables are backed by empirical evidence in the previously discussed literature. The chosen variables form a model to examine the factors influencing the ongoing use of fintech with fintech adoption as a mediating variable. Table 2 shows the dimensions and indicators for each estimated variable.

The method to analyze the data to estimate the research model was the Partial Least Squares Structural Equation Modelling (PLS-SEM) using Smart PLS 4.0 software (Hair et al., 2010). PLS-SEM with SmartPLS 4.0 is appropriate for this study's analytical needs. PLS-SEM effectively tests theoretical frameworks predictively and handles complex structural models with multiple constructs and relationships. SEM estimates complex cause-effect relationships with latent and observed variables making it useful for analyzing theoretical frameworks. PLS-SEM effectively balances explanation and prediction aligning with current research needs and making it a suitable choice for drawing significant empirical conclusions (Asra, Agung, Munawir, & Novi, 2022; Hair et al., 2022).

There were six stages in applying the SEM analysis: (1) Defining individual constructs to have the measurement of model specification. (2) Formulating a measurement model to estimate loading factors by drawing a path diagram, measuring variables and constructing latent, and adding error terms. (3) Estimating construct reliability and variance extracted to know the reliability and validity of the goodness of fit model. (4) Formulating structural model. (5) Examining model validity by testing the hypothesis and structural relationship of variables

and (6) drawing conclusion to confirm whether or not the data analysis is theoretically justified (Asra et al., 2022). The analysis was conducted using Smart PLS 4.0 with one-tailed testing of the hypothesis at a significance level of 0.05. The analysis of the inner model concentrated on the coefficient of determination (R2) and path coefficients (Hair et al., 2022).

4. RESULTS AND DISCUSSION

4.1. Results

4.1.1. Characteristics of Respondents

The result of data analysis concerning the characteristics of respondents can be seen in Table 1. Based on gender, out of a total of 343 respondents, the majority are female (58%), while male account for 42%. Furthermore, based on age categories, Gen Z dominates with 68.2%. Whereas Gen Millennial is at 23.9% followed by Gen X at 6.4%, and Gen Baby Boomers at only 1.5%. In terms of education, most respondents hold a bachelor's degree (55.7%) while those with master and doctoral degrees account for 9.6% and 1.5%, respectively. The remaining 33.2% do not hold a bachelor's degree.

In terms of fintech services, about 36.7 % of the respondents surveyed used GOPAY fintech service followed by OVO (27.4%), Shopeepay (23.6%), Dana (5.2%), Paylater (1.7%), and LinkAja (0.3%). The rest of the 5% of respondents used other categories of fintech services. Moreover, in terms of the frequency of using fintech services, nearly half of the respondents (49.6%) used these fintech services more than five times a week. About 16.6% of respondents used fintech services twice a week, 14.9% once a week, 11.4% three times a week, and 7.6% four times a week (see Table 1).

Table 1. Characteristics of respondents based on gender, age, educational background, types of fintech services used, and the frequency of using fintech services.

Description	Category	Total	Percentage (%)
Gender	Male	144	42.0
	Female	199	58.0
Total		343	100
Age	Gen Z	234	68.2
	Gen millennials	82	23.9
	Gen X	22	6.4
	Gen baby boomers	5	1.5
Total		343	100
Educational level	Not a bachelor's degree	114	33.2
	Bachelor degree	191	55.7
	Master's degree	33	9.6
	Doctorate	5	1.5
Total		343	100
Types of fintech services used	Gopay	126	36.7
	OVO	94	27.4
	Shopeepay	81	23.6
	Dana	18	5.2
	LinkAja	1	0.3
	Paylater	6	1.7
	Others	17	5.0
Total		343	100
The frequency of using fintech services	Once a week	51	14.9
	Twice a week	57	16.6
	Three times a week	39	11.4
	Four times a week	26	7.6
	More than five times a week	170	49.6
Total		343	100

Source: Calculated from questionnaires.

Table 2. Outer loadings results related to the reliability test.

Variables	Dimensions	Indicators	Outer loading	Composite reliability	Cronbach's alpha	Result
Perceived benefit (PB)	Economic benefit	Cheaper price (PB1)	0.824	0.845	0.727	Reliable
		Save money (PB2)	0.834			Reliable
		Using multiple services at low cost (PB3)	0.754			Reliable
	Seamless transaction	Use multiple services simultaneously (PB4)	1.000	0.840	0.778	Reliable
	Convenience	Quick use (PB5)	0.838	0.891	0.816	Reliable
		Use anywhere and anytime (PB6)	0.828			Reliable
		Easily use (PB7)	0.899			Reliable
Perceived ease of use (PEOU)	Easiness	Easily use compare to traditional payments (PEOU1)	1.000	0.872	0.777	Reliable
	Clean and understandable	Clear and easy to grasp (PEOU2)	1.000			Reliable
	Easy to learn	Easy to learn (PEOU3)	1.000			Reliable
Perceived risk (PR)	Financial risk	Financial loss may occur (PR1)	0.850	0.866	0.767	Reliable
		Fraud may occur (PR2)	0.864			Reliable
		Financial loss may occur if not compatible with other services (PR3)	0.764			Reliable
	Performance risk	Issue with credit status (PR4)	0.921	0.914	0.812	Reliable
		Incorrect payment (PR5)	0.914			Reliable
	Security risk	Misuse of personal information (PR6)	0.854	0.918	0.866	Reliable
		Personal information not secure (PR7)	0.912			Reliable
		Unauthorized access to personal information (PR8)	0.899			Reliable
Perceived usefulness (PU)	Can meet the needs	Meet my needs (PU1)	1.000	0.914	0.874	Reliable
	Being fast	Save time (PU2)	1.000			Reliable
	Effectiveness	Increase effectiveness (PU3)	1.000			Reliable
	Useful	Overall useful (PU4)	1.000			Reliable
Fintech usage adoption (FUA)	Frequent use	More often than traditional financial services (FUA1)	1.000	0.924	0.836	Reliable
	Continuance	Current use and will continue to use (FUA2)	1.000			Reliable
	Experience	Have a lot experience (FUA3)	0.931			Reliable
		Benefit from use fintech (FUA4)	0.922			Reliable
	Actual use	Make many transactions using fintech (FUA5)	1.000			Reliable
Fintech usage continuity (FUC)	Consider to use	Consideration in using fintech (FUC1)	1.000	0.901	0.833	Reliable
	Continue to use	Willingness to use continuously (FUC2)	1.000			Reliable
	Will be recommended	Will use in the future (FUC3)	1.000			Reliable

Source: Calculated from questionnaires.

4.1.2. Model Measurement

The results of the outer loading analysis to evaluate the reliability and validity of the indicators used to measure variables in the study are shown in Table 2. According to Table 2, all indicators in the outer model have composite reliability above 0.7. These results indicate that the reliability of each indicator is adequate for measuring its respective construct.

Furthermore, the findings of the Average Variance Extracted (AVE) within the outer model are shown in Table 3. As determined by the Average Variance Extracted (AVE) for each construct presented, the findings from the validity assessment demonstrate that each construct accounts for over 50% of the variance in its respective indicators. The Average Variance Extracted (AVE) value for each construct exceeds 0.5. These results indicate that each indicator is valid.

Table 3. Results of the average variance extracted (AVE) in the outer model.

Variables	Dimensions	AVE	Conclusion
Perceived benefit (PB)	Economic benefit	0.644	Valid
	Convenience	0.732	Valid
Perceived ease of use (PEOU)	Easiness	0.699	Valid
	Clear and understandable		Valid
	Easy to learn		Valid
Perceived usefulness (PU)	Can meet the needs	0.726	Valid
	Being fast		Valid
	Effectiveness		Valid
	Useful		Valid
Perceived risk (PR)	Financial risk	0.684	Valid
	Performance risk	0.842	Valid
	Security risk	0.790	Valid
Fintech usage adoption (FUA)	Experience	0.859	Valid
Fintech usage continuity (FUC)	Intention to adopt	0.754	Valid
	Will adopt		Valid
	Will recommend		Valid

The results of the Heterotrait-Monotrait (HTMT) ratio are shown in Table 4. According to Table 4, the HTMT value for each variable is below 0.9. This demonstrates the discriminant validity of each construct within the scope of this study. In other words, there is a significant level of difference between the constructs being studied.

Table 4. Results of the Heterotrait-Monotrait ratio (HTMT) for the outer model.

	FUA	FUC	PB	PEOU	PR	PU
FUA						
FUC	0.790					
PB	0.612	0.607				
PEOU	0.527	0.533	0.676			
PR	0.065	0.088	0.145	0.085		
PU	0.754	0.754	0.705	0.647	0.056	

The results of hypothesis testing are given in Table 5. According to Table 5, out of the 13 hypotheses, seven hypotheses are supported while six are not. This conclusion is derived from assessing the path coefficients and p-values or t-values obtained through the Smart PLS application. These seven hypotheses are H1, H4, H5, H8, H9, H10 and H13, while H2, H3, H6, H7, H11 and H12 do not support the hypothesis.

The findings indicated that perceived benefit and usefulness positively and significantly affect the adoption of fintech usage. These two factors also significantly affect the continuity of fintech usage. However, perceived ease of use and perceived risk do not significantly affect the adoption of fintech usage and the continuity of fintech usage.

Further, fintech usage adoption affects significantly the continuity of fintech usage. The fintech usage adoption also mediates the effects of perceived benefit and perceived usefulness on fintech usage continuity. However, fintech usage adoption does not mediate the effect of perceived ease of use and perceived risk on the continuity of fintech usage (see Table 5).

Table 5. The estimated results of path coefficients, significance levels, and the conclusions of the hypothesis tests.

No	Hypothesis	Path coefficients	T statistics (|O/STDEV)	p-values	Conclusion
H1	Perceived benefit positively and significantly affects the adoption of fintech usage.	0.168	2.846	0.002	Supported
H2	Perceived ease of use positively and significantly affects the adoption of fintech usage.	0.078	1.237	0.108	Not supported
H3	Perceived risk has a negative effect on fintech usage adoption.	0.010	0.229	0.410	Not supported
H4	Perceived usefulness positively and significantly influences fintech usage adoption.	0.525	7.870	0.000	Supported
H5	Perceived benefit positively and significantly affects fintech usage continuity.	0.087	1.803	0.036	Supported
H6	Perceived ease of use has a positive effect on fintech usage continuity.	0.046	0.864	0.194	Not supported
H7	Perceived risk negatively and significantly influences fintech usage continuity.	-0.055	1.422	0.078	Not supported
H8	Perceived usefulness positively and significantly influences the continuity of fintech usage.	0.277	4.384	0.000	Supported
H9	Fintech usage adoption positively and significantly affects fintech usage continuity.	0.439	7.833	0.000	Supported
H10	Fintech usage adoption mediates the effect of perceived benefit on fintech usage continuity.	0.074	2.762	0.003	Supported
H11	Fintech usage adoption mediates the effect of perceived ease of use on fintech usage continuity.	0.034	1.185	0.118	Not supported
H12	Fintech usage adoption mediates the effect of perceived risk on fintech usage continuity.	0.004	0.228	0.410	Not supported
H13	Fintech usage adoption mediates the effect of perceived usefulness on fintech usage continuity.	0.230	5.534	0.000	Supported

4.2. Discussion

According to Table 5, out of the 13 hypotheses, seven are supported while six are not. Factors that positively and significantly affect the adoption of fintech usage are perceived benefit and usefulness. These two factors also positively and significantly affect the continuity of fintech usage. These findings indicate that the present fintech services under the survey have not only given economic benefits (a cheaper price, saving money and low cost in using fintech services), seamless transaction, and convenience (quick use, use anywhere and anytime, and easy use) but also useful for fintech users' respondents as they can meet the needs of users, being fast, effectiveness, and usefulness. This finding supports studies by Alkadi and Abed (2023); Razzaque et al. (2020); Akturan and Tezcan (2012); Gao and Bai (2014); Hu et al. (2019); Ming and Jais (2022); Purwantini and Anisa (2021) and Nugraha et al. (2022).

The insignificant effects of perceived ease of use and perceived risk on the adoption of fintech usage and the continuity of fintech usage suggest at least three reasons. First, it may be because fintech users' respondents ignored the risks and the importance of ease of use of fintech. Second, it may be because the fintech users' respondents value the benefits and usefulness of fintech more than the risk and ease of use of fintech. Third, it may be due to the lack of knowledge related to the use of fintech services. The risk indicators that are highlighted in this context include financial risks, performance risks, and security risks. Whereas the ease-of-use indicators in this study context include easiness, clean and understandable and easy to learn. These findings are in contrast to the previous studies conducted by Gefen et al. (2003); Hutapea and Wijaya (2021); Li et al. (2023); Tang et al. (2020); Zhang and Yu (2020); Diana and Leon (2020)l Forsythe et al. (2006); Gerlach and Lutz (2019); Abd Malik and Syed Annuar (2019); Mufarih et al. (2020); Putritama (2019) and Tanadi et al. (2015) as they found the ease of using fintech has a significant influence on the adoption of fintech usage and the continuity of fintech usage. Similarly, the insignificant effect of perceived ease of use on the adoption of fintech services and the continuity of fintech usage does not support the study's findings done by Sum Chau and Ngai (2010); Akturan and Tezcan (2012) and Venkatesh and Davis (2000).

Furthermore, fintech usage adoption significantly affects the continuity of fintech usage. The fintech usage adoption also mediates the effects of perceived benefit and perceived usefulness on fintech usage continuity. These findings are in line with previous studies conducted by Davis (1985); Davis (1989); Gan and Wang (2017); Hasanul, Hassan, Ahmad, and Alam (2022); Hassan et al. (2022); Mascarenhas et al. (2021); Ryu (2018) and Sari (2022). These findings suggest two things. First, the continuity of fintech usage by users' respondents are influenced or subject to frequent use, continuance, and experience as indicators of fintech adoption in this study. Second, it highlights the importance of the perceived benefit and usefulness of fintech for the users to adopt as well as to continue using fintech services.

However, fintech usage adoption does not mediate the effect of perceived ease of use and perceived risk on the continuity of fintech usage. As noted previously, this may be because the fintech users' respondents value the benefits and usefulness of fintech more than the risk and ease of use of fintech in adopting and continuing fintech usage. These findings do not support previous studies undertaken by Ali et al. (2021); Chan et al. (2022); Diana and Leon (2020); Hassan et al. (2022); Abd Malik and Syed Annuar (2019) and Ming and Jais (2022).

Therefore, the perceived benefit and usefulness of fintech are the determinant factors leading to the adoption and the continuity of fintech usage by fintech users' respondents under the survey. While perceived ease of use and perceived risks have no significant effects on the adoption and the continuity of fintech usage. The knowledge contribution and implications of these findings are as follows: First, the findings contribute to the knowledge of the importance of the perceived benefit and usefulness of fintech in comparison with the perceived ease of use and perceived risks for users to adopt and continue fintech usage. Second, the fintech services need to give more attention to adding more benefits and usefulness of fintech to encourage the consumers to adopt fintech on the one hand, and users to sustain the continuity of fintech usage on the other hand. Finally, the government needs to continue improving digital literacy and digital financial literacy to aware consumers and the users about the risks and ease of use of fintech.

5. CONCLUSION

This study aimed to investigate the factors that influence the continuity of financial technology (fintech) usage by taking Indonesia as a case. Factors hypothesized to drive the continuity of fintech usage are perceived benefit, perceived risk, perceived ease of use and perceived usefulness with the adoption of fintech usage as a mediating variable. This research enhances knowledge of theories by incorporating and expanding upon established frameworks of the Theory of Reasoned Action (TRA) and the Technology Acceptance Model (TAM).

The findings indicated that perceived benefit and perceived usefulness positively and significantly affect the adoption of fintech usage. These two factors also affect the continuity of fintech usage. However, perceived ease of use and perceived risk do not significantly affect the adoption of fintech usage and the continuity of fintech usage. The fintech usage adoption affects significantly the continuity of fintech usage. The fintech usage adoption also mediates the effect of perceived benefit and perceived usefulness on fintech usage continuity. However, the fintech usage adoption does not mediate the effect of perceived ease of use and perceived risk on the continuity of fintech usage. These findings confirm the theories of Reasoned Action (TRA) and the Technology Acceptance Model (TAM) but do not support the findings of the previous studies advanced in the literature particularly related to the effects of perceived ease of use and the perceived risks on the adoption of fintech and the continuity of fintech usage.

The knowledge contribution and policy implications of these findings are as follows: First, the findings contribute to the knowledge of the importance of the perceived benefit and usefulness of fintech in comparison with the perceived ease of use and perceived risks for users to adopt and continue fintech usage. Second, the fintech services need to give more attention to adding more benefits and usefulness of fintech to encourage the consumers to adopt fintech on the one hand, and users to sustain the continuity of fintech usage on the other hand. Third, the government needs to continue improving digital literacy and digital financial literacy to aware consumers and users about the risks and ease of use of fintech.

However, this study has certain limitations which are as follows: First, this study utilized a cross-sectional design relying on subjective self-reports obtained from fintech users from six fintech services located in Jakarta. Second, the sampling method used was by employing a non-probability sampling method to select 343 respondents. This sampling method cannot be generated for the whole of Indonesia. Third, the model developed was limited to variables of perceived benefits, perceived ease of use, perceived risk, perceived usefulness, the adoption of fintech, and the continuity of fintech usage. Fourth, the instrument used to collect the data relied heavily on the online questionnaire administered on Google Forms which may offer inaccurate or strategically biased responses given by the respondents. Therefore, caveats apply to interpret the estimated results of the study.

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Institutional Review Board Statement: The Ethical Committee of the Faculty of Economics and Business, Universitas Tarumanagara, Indonesia has granted approval for this study (Ref. No. 072-D/127/FE-UNTAR/I/2025).
Transparency: The authors declare that the manuscript is honest, truthful and transparent, that no important aspects of the study have been omitted and that all deviations from the planned study have been made clear. This study followed all rules of writing ethics.
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