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Behavioral and Risk Factors in SME FinTech Adoption: Evidence from Indonesian Small Enterprises

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Abstract. The integration of financial technology (FinTech) into small and medium enterprises' (SMEs') financing systems has become a pivotal force in enhancing financial inclusion across developing economies. However, SME adoption remains uneven due to behavioural, technological, and perceived-risk barriers. This study develops a fundamental behavioural–financial model that unites the Theory of Planned Behaviour (TPB), the Technology Acceptance Model (TAM), and Perceived Risk Theory to examine FinTech adoption among Indonesian SMEs. Using a quantitative approach, survey data were collected from 160 SME owners and managers in East Java Province. The analysis employed Partial Least Squares–Structural Equation Modelling (PLS-SEM) to test the relationships among behavioural intentions, technological perceptions, and risk awareness. The results demonstrate that both behavioural constructs (attitude, normative beliefs, and perceived control) and risk perception significantly influence FinTech adoption, while technological acceptance variables exert only an indirect effect. This indicates that the willingness to use FinTech among SMEs is strongly shaped by social norms and trust in financial systems rather than by perceived usefulness alone. The novelty of this research lies in the integration of perceived risk into the TPB–TAM framework, offering a more comprehensive understanding of FinTech behaviour within emerging economies. The proposed model provides an empirical foundation for policymakers and financial institutions to design inclusive, low-risk FinTech ecosystems that foster SME resilience and sustainable economic growth.

Keywords: Theory of Planned Behavior, Technology Acceptance Model, Perceived Risk

1. Introduction

Financial Technology (FinTech) regulation has become a global challenge for the financial and banking industries. The issues faced by developed and developing countries differ significantly due to their distinct socio-demographic contexts (Alattass, 2023; Alshannag et al., 2025; Huarng & Yu, 2022). However, this situation presents an opportunity for developing countries to catch up by formulating more adaptive regulatory frameworks. It is hoped that the expansion of FinTech in Indonesia can develop appropriately and securely in the future (Buckley et al., 2016). In general, FinTech refers to the use of technology to deliver financial solutions and plays a vital role in the modern financial ecosystem. While FinTech is instrumental in democratising access to credit for unbanked and underbanked consumers worldwide, it is also increasingly being adopted by well-served customers seeking faster services and greater transparency.

Previous studies have integrated various behavioural theories to explain technology adoption. For instance, several researchers have combined the Value–Belief–Norm Theory with the Theory of Planned Behaviour (TPB) (Lee et al., 2023), the TPB with the Theory of Perceived Risk (Pillai et al., 2022), and the TPB with the Hedonic Motivation System Adoption Model (Perez et al., 2023). Moreover, some scholars have merged the TPB with the Technology Acceptance Model (TAM), incorporating two constructs from TPB into the TAM framework. This integration addresses TAM's limitation in explaining behavioural control in information system usage by complementing it with TPB components. Consequently, the combination of these theories enables a more comprehensive analysis of the factors influencing attitudes and behavioural intentions toward information system adoption, particularly the intention to use financial technology (Mathieson, 1991).

The limitations of the TAM and the TPB lie in their inability to account for the potential risks faced by micro, small, and medium-sized enterprises (MSMEs) when compared with the benefits of using FinTech. The novelty of this study is the inclusion of risk as an integral component of the proposed model. By integrating TAM, TPB, and perceived risk, this research aims to develop a more comprehensive framework for predicting the factors that influence the adoption of FinTech among small and medium enterprises (SMEs) (Coffie et al., 2021).

One of the models that explain the utilisation of FinTech is the TAM, which is considered appropriate because it provides a strong yet straightforward explanation of technology acceptance and user behaviour (Davis, 1985). The TAM posits that an individual's intention to use technology is influenced by their belief in their ability to use it and their subjective evaluation of the benefits that can be derived from its use (Morgan-Thomas & Veloutsou, 2013; Kusuma & Kusumawati, 2023).

The TAM, which is a modification of the Theory of Reasoned Action (TRA), explains that perceived ease of use, perceived usefulness, and attitude influence the intention to use technology, which subsequently affects its actual use. In several previous studies, although TAM has often been used as a foundational model for further development (Muk & Chung, 2015), the variables of perceived ease of use and perceived usefulness are recommended to remain integral to the model. This is because, in addition to predicting users' intentions, they also help to estimate user behaviour in accepting a particular technology (Svendsen et al., 2013).

The belief perspective is constructed through the combination of various characteristics, qualities, and attributes of specific information that collectively shape behavioural intentions. Intention refers to a decision to act, formed through a desired stimulus or means, which leads to behaviour either consciously or unconsciously. It is this intention that serves as the starting point for the formation of an individual's behaviour.

The TPB is considered appropriate for explaining behaviours that require planning (Ajzen, 1991). TPB is an extension of the TRA, which provides empirical evidence that the intention to perform certain actions arises from two determinants: subjective norms and attitudes towards the behaviour. Several

years later (Ajzen, 2012) introduced an additional component, perceived behavioural control, which transformed the original Theory of Reasoned Action into the TPB.

According to Martins et al. (2014), perceived risk has a significant impact on users' interest in payment systems. Therefore, the intention to adopt FinTech-based financing may also be influenced by perceived risk. In addition, perceived cost is believed to affect the intention to use technology, as users possess varying perceptions of the expenses involved in operating a system (Kleijnen et al., 2004), which in turn impacts their intention to use it. Previous studies have shown that perceived cost influences the intention to use additional services such as mobile banking and mobile commerce (Wu & Wang, 2005); however, it remains unclear whether the same effect applies to FinTech lending.

Although the small and medium enterprise (SME) sector is a vital contributor to employment, diversification, and productivity in most economies, it continues to face significant credit constraints, particularly in developing countries such as Indonesia. Nevertheless, the emergence of digital innovation in the FinTech industry offers an alternative source of financing that has been widely adopted (Charaia et al., 2021).

This study highlights the importance of promoting FinTech usage among SMEs in developing countries and the need for appropriate regulations to encourage adoption. Recent studies in emerging economies emphasize that digital information quality, financial knowledge, and user mindset play a crucial role in shaping sustainable participation in digital financial services (Subedi, 2024). Furthermore, digital awareness, technology trust, and access to digital banking have been found to significantly enhance financial inclusion, particularly among underserved groups such as women in developing countries (Nepal, 2025). The purpose of this analysis is to identify theoretical frameworks that can strengthen SMEs' attitudes towards financial technology and enhance their intention to use FinTech services. This research is significant as it provides valuable insights into improving SMEs' behavioural readiness for financial technology adoption. Furthermore, the findings of this study are expected to make a substantial contribution to policymakers, financial institutions, and other relevant stakeholders.

2. Literature Review

Research on financial technology largely draws upon two fundamental theoretical frameworks, namely the TAM and the TPB. Although these theories have been widely applied to explain user acceptance of financial technology, certain important aspects still require greater attention, particularly when FinTech is used for payment systems. While the TPB has proven to be an effective model for explaining intention, perceived behavioural control, and behavioural prediction, it does not fully capture the potential risks involved in FinTech usage (Shin, 2010). Therefore, integrating the Technology Acceptance Model, the Theory of Planned Behaviour, and the concept of perceived risk is expected to provide a more comprehensive understanding of the factors that strengthen the adoption and use of financial technology.

Bank Indonesia Regulation Number 18/40/PBI/2016 concerning the Implementation of Payment Transaction Processing was established to support the development of FinTech and e-commerce in Indonesia. This regulation covers several key aspects, including the facilitation of FinTech and e-commerce innovation, the protection and comfort of consumers, and the maintenance of fair competition among FinTech industry players in Indonesia. Furthermore, FinTech can be specifically defined as the application of digital technology aimed at facilitating financial intermediation.

In addition, Regulation Number 31/POJK.05/2016 concerning the Pawnshop Business and Regulation Number 77/POJK.01/2016 concerning Information Technology-Based Lending and Borrowing Services are part of Indonesia's regulatory framework governing FinTech activities. These regulations demonstrate the government's efforts to respond to the rapid growth of FinTech in the country. Establishing such regulations is essential to ensure legal certainty, investor confidence, and a sense of security for users of FinTech services.

Bank Indonesia also supports business actors in Indonesia by providing a comprehensive evaluation of FinTech. The presence of FinTech for SMEs is expected to assist in the development of their businesses, particularly in terms of access to financing. FinTech includes peer-to-peer (P2P) lending, which enables SMEs that do not meet conventional bank loan requirements to obtain financial support (Pauwels, 2013). Ultimately, the implementation of FinTech can help increase the availability of capital, including through schemes such as the People's Business Credit (KUR).

The innovations offered by financial technology (FinTech) are extensive across all sectors, ranging from Business to Business (B2B) to Business to Consumer (B2C). Examples of financial activities related to FinTech include: (a) buying and selling shares, (b) financial payments, (c) money lending and peer-to-peer credit, (d) money transfers, (e) small business investments, and (f) financial planning for personal finances. FinTech has a significant influence on people's financial activities, making them simpler and more efficient (Kraus et al., 2016). It enables individuals to access a variety of financial products and enhances financial literacy, allowing the public to experience the tangible benefits of FinTech.

Understanding the types of FinTech is essential in order to recognise its uses and advantages (Ardiansyah, 2019; Garad et al., 2025; Hassan et al., 2024; Kusumawati et al., 2022). Moreover, FinTech has been shown to have a direct relationship with the extent to which digital technology is applied in managing tax obligations and the level of fiscal discipline within a country (Ivanchenkova et al., 2022).

According to Bank Indonesia, FinTech can be classified into several categories: (1) Peer-to-peer lending and crowdfunding: In this type, FinTech acts as an intermediary connecting investors with capital seekers (Belleflamme et al., 2014); (2) Market aggregator: FinTech serves as a platform for comparing financial products by collecting and compiling financial data to be used as a reference by users. This classification is also referred to as a comparison site or financial aggregator; (3) Risk and investment management: FinTech in this category functions as a financial planner in the form of a digital application; (4) Payment, settlement, and clearing: This classification includes FinTech services related to payments, such as payment gateways and electronic wallets (e-wallets).

TPB explains that attitudes towards behaviour are a key factor in predicting actions. However, it is also important to consider an individual's attitude when examining subjective norms and assessing perceived behavioural control. When individuals hold a positive attitude, receive support from those around them, and perceive the behaviour as convenient, their intention to perform that behaviour is likely to increase. Planned behaviour is a variable adapted from TPB, which is widely recognised as an effective model for explaining intentions, perceived behavioural control, and actual behaviour (Hamzah & Mustafa, 2019). TPB itself is an extension of the TRA. The TRA model was expanded by incorporating the element of behavioural control, which is expected to moderate the relationship between intentions and behaviour.

The main distinction between the TPB and the TRA lies in the inclusion of perceived behavioural control as an additional determinant of intentions and behaviour. According to TPB, understanding behaviour depends on both motivation and ability. These cognitive-behavioural models suggest that human actions are guided by three key considerations: (1) attitude, (2) normative beliefs, and (3) control beliefs (Hamzah & Mustafa, 2019). The theory posits that the likelihood of individuals performing certain behaviours increases if they believe the behaviour will lead to desired outcomes, if they perceive that important others expect them to act in that manner, and if they believe they possess the necessary resources and opportunities to do so. TPB further explains that behavioural intentions are influenced by one's attitude towards the behaviour, the subjective norm, and perceived behavioural control (Ajzen, 1991)

H1: Attitude, normative beliefs, and perceived behavioral control have a significant positive effect on MSMEs' intention to adopt FinTech.

The Technology Acceptance Model (TAM) was first introduced by Davis (1985). TAM is a very popular model used to explain and predict system usage. Later development of TAM involved behavioral intention as a new variable that was directly influenced by the perceived benefits. The model was later developed by Davis et al. (1989) into a model that is more efficient in explaining and predicting users' interests in technology. The model, which is a modification of the TRA, explains that perceived ease of use, perceived usefulness, and attitude affect the intention to use, which then impacts the actual use of technology. In some previous studies, although TAM has been used as a basic model for development (Muk & Chung, 2015), the variables perceived ease of use and perceived usefulness are still recommended to remain in use because, in addition to being able to predict user intention, they can also estimate user behavior in accepting a technology. The development of TAM occurred in three phases: adoption, validation, and extension. In the adoption stage, it was tested and applied in a large number of information system applications. In the validation phase, researchers noted that TAM provides accurate measurements of acceptable behavior in various technologies. The extension phase involved studies introducing several new variables and determining the relationships among TAM constructs (Momani et al., 2017).

H2: Perceived usefulness and perceived ease of use have a significant positive effect on MSMEs' intention to adopt FinTech.

Risk management has become increasingly politicized and contentious in various activities. Polarized views, controversy, and open conflict have become widespread. Recent research on risk perception has provided a new perspective on this issue, emphasizing that mistrust in risk analysis and risk management plays a central role. Recognizing the importance of trust and understanding how risk is perceived, risk management considers risk acceptance an essential component (Slovic, 1993). The risks associated with activities always attract the attention of FinTech users. If it is associated with the use of a system or technology, then perceived risk can be explained as a risk awareness or privacy risk regarding using personal data, and information can be obtained and misused by irresponsible parties (Amaro & Duarte, 2015)

Higher perceived risk negatively affects users' attitudes toward technology, and vice versa. Therefore, perceived risk is expected to have a detrimental impact on the attitudes of technology users (Martins et al., 2014). Furthermore, perceived risk has been shown to negatively influence the attitudes and behaviors of mobile banking users; thus, it is also expected to adversely affect the attitudes of FinTech users.

H3: Perceived risk has a significant positive effect Intention to Adopt FinTech of MSMEs.

3. Methodology

3.1. Data

This study employs a quantitative research method, which is based on the philosophy of positivism. The population in this study consists of all small and medium enterprises (SMEs) in Sidoarjo Regency. The data used in this research consist of both primary and secondary data. Secondary data were obtained from official records and reports provided by the MSME Office Center. Primary data, on the other hand, were collected directly from respondents through questionnaires without any intermediary. The primary data in this study represent the responses provided by the research subjects to the questionnaire items.

3.2. Population and sampling

The population of this study consists of all SMEs registered at the Office of Cooperatives and SMEs in Sidoarjo Regency, East Java Province, Indonesia, totaling approximately 1,342 enterprises. This study employs purposive sampling, a non-probability sampling technique in which samples are selected based on specific criteria relevant to the research objectives and determined by the researchers, as shown in Table 1.

Table 1. The criteria of sample

No.	Criteria	Number of MSMEs
1.	Number of SME owners in Sidoarjo Regency	1,342
2.	SMEs that have been established for more than 5 years	955
3.	SMEs that have a clear business location	350
4	SMEs engaged in the food and beverage sector	250
5	SMEs registered with the Cooperatives and SMEs Office	188

To ensure the data remained relevant to the research purpose, specific criteria were applied to select an initial pool of 188 respondents. Following the distribution of questionnaires, an 85% response rate was recorded. Consequently, 160 respondents met the requirements and were included in the final analysis.

3.3. Data collection technique

In this study, the data were obtained through questionnaires. A questionnaire is a set of written questions designed to collect information from respondents regarding themselves or topics they are familiar with. The questionnaires were distributed directly to the respondents by visiting them at their places of activity to ensure the collection of accurate data. The primary purpose of data analysis is to generate information that helps solve research problems. The analysis in this study employed descriptive statistics, data quality tests, classical assumption tests, and hypothesis testing using the Partial Least Squares (PLS) program for Windows.

Structural Equation Model

Intention to Adopt FinTech = β_0 + 1 Planned Behaviors + β_2Technology Acceptance Model + β_3 Perceived Riskβ + e_1

The constructs that have been empirically tested are the core components derived from the TPB, namely attitude, normative beliefs or subjective norms, and control beliefs or perceived behavioral control. This conceptual distinction is explicitly reflected in the operational definition of variables in Table 2, where the TPB is operationalized through these three dimensions.

Table 2. Variable Operational

Variable	Indicators	Source
Theory Planned Behavior	1. Attitude 2. Normative beliefs 3. Control beliefs	Hamzah and Mustafa (2019)
Theory Acceptance Model	1. Perceived usefulness 2. Perceived ease of use 3. Attitude	Fishbein and Ajzen (1975)
Perceived Risk	1. Financial Risk 2. Performance Risk 3. Psychological risk 4. Social Risk	Martins et al. (2014)

In this study, FinTech is positioned as the research context, while the dependent variable is SMEs' intention to adopt FinTech services.

3.4. Data analysis technique

The analysis of the primary data collected through questionnaires followed a structured, multi-stage procedure to ensure data quality, measurement accuracy, and the validity of statistical inferences. All analyses were conducted using Partial Least Squares–Structural Equation Modeling (PLS-SEM)

implemented in SmartPLS software, which is appropriate for predictive models with latent constructs and relatively small to medium sample sizes.

First, descriptive statistical analysis was performed to summarize respondents' demographic and business characteristics and to examine response distributions for all measurement items. This step included the calculation of means, standard deviations, minimum and maximum values, and frequency distributions to identify potential anomalies, missing data patterns, or extreme values.

Second, data quality screening was conducted prior to model estimation. Questionnaires with incomplete responses, inconsistent answer patterns, or excessive missing values were excluded from further analysis. Normality was assessed descriptively (skewness and kurtosis), recognizing that PLS-SEM does not require multivariate normality. Multicollinearity among indicators and constructs was preliminarily examined using variance inflation factor (VIF) values to ensure that collinearity did not bias parameter estimates.

Third, the measurement model was evaluated to establish validity and reliability of the constructs. Indicator reliability was assessed using outer loadings, with values above 0.70 considered acceptable. Internal consistency reliability was examined using Cronbach's alpha and composite reliability (CR), with threshold values of 0.60 for exploratory research and 0.70 for established constructs. Convergent validity was assessed through the average variance extracted (AVE), requiring values greater than 0.50. Discriminant validity was evaluated by examining cross-loadings and ensuring that each indicator loaded more strongly on its associated construct than on others.

Fourth, after confirming the adequacy of the measurement model, the structural model was assessed. Path coefficients representing the hypothesized relationships among the TPB, TAM, perceived risk, and intention to adopt FinTech constructs were estimated. The coefficient of determination (R^2) was examined to evaluate the explanatory power of the model for the endogenous variable (intention to adopt FinTech). Effect sizes (f^2) were also considered to assess the relative contribution of each exogenous construct.

Fifth, hypothesis testing was conducted using a bootstrapping procedure with a large number of resamples (e.g., 5,000) to obtain robust estimates of standard errors, t-statistics, and p-values. The statistical significance of each hypothesized relationship was determined based on t-values and corresponding p-values, with a significance level of 5%. Although the hypotheses are conceptually directional, a two-tailed test was applied to provide a conservative assessment of significance.

Finally, the overall model results were interpreted by integrating statistical significance, explanatory power, and theoretical consistency with the TPB–TAM–Perceived Risk framework. This step ensured that conclusions regarding SMEs' intention to adopt FinTech were supported not only by statistical evidence but also by sound theoretical reasoning, thereby enhancing the replicability and credibility of the findings.

4. Results

The data obtained from the questionnaire responses were tabulated using Microsoft Excel. Subsequently, several tests were conducted, including validity and reliability tests of the research instruments. After all the data met the necessary requirements, a significance test was performed to examine the influence of all the variables under study.

Table 3. Outer Loading

	Financial Technology	Perceived Risk	TAM	TPB
X1-1				0.946
X1-2				0.800
X1-3				0.905
X2-1			0.910	
X2-2			0.970	
X2-3			0.750	
X3-1		0.735		
X3-2		0.741		
X3-3		0.972		
X3-4		0.812		
Y1-1	0.976			
Y1-2	0.813			
Y1-3	0.853			

Based on Table 3, the outer loading values indicate that all indicators for each variable, namely Financial Technology, Perceived Risk, Technology Acceptance Model (TAM), and Theory of Planned Behavior (TPB), have loading values greater than 0.7. This result shows that the correlation between each indicator and its corresponding construct demonstrates a high level of reflective validity. Therefore, the indicators in this study can be considered valid measures of their respective latent variables.

Table 4. Construct Reliability and Validity

	Cronbach'a Alpha	Rho_A	Composite Reliability	AVE
Intention to Adopt FinTech	0.643	0.960	0.615	0.753
Perceived Risk	0.735	1.024	0.725	0.696
TAM	0.710	0.831	0.763	0.639
TPB	0.632	0.888	0.744	0.574

Based on Table 4, it can be concluded that the composite reliability values are above 0.7 for each variable, and the Cronbach's alpha values are above 0.6. Therefore, the measurement items for each variable can be considered reliable.

Table 5. Path Coefficients

Hypotheses	Original Sample	Sample Mean	Standard Deviation	T Statistics	P Value
TPB → Intention to Adopt FinTech	0.437	0.455	0.111	3.934	0.000
TAM → Intention to Adopt FinTech	0.031	0.038	0.037	0.831	0.406
Perceived Risk → Intention to Adopt FinTech	0.537	0.512	0.120	4.488	0.000

The results presented in Table 5 provide information about the influence of each variable examined in this study. The data indicate that when the p-value is less than 0.05, the relationship between the variables is considered significant. The analysis results in Table 4 show that only the variable representing the TAM and the intention to adopt FinTech does not exhibit a significant relationship.

Relying solely on traditional frameworks such as the TPB or the TAM is insufficient to fully explain the rapid growth of financial technology. These theories tend to overlook an important consideration, namely the inherent security risks associated with FinTech. As a result, the integration of risk related factors is essential, particularly when examining fintech adoption among small and medium sized

enterprises. Nevertheless, the TPB remains central to this study. The findings demonstrate that this framework significantly influences SMEs' intention to adopt FinTech. Its three core constructs Attitude, Subjective Norms, and Perceived Behavioral Control are shown to be valid and reliable determinants of SME decision-making.

The relationship between these factors and actual usage is conceptually sound and consistent with the characteristics of the FinTech ecosystem. Attitude toward behavior functions as a key catalyst for adoption. A positive attitude emerges when SMEs perceive FinTech not merely as a technological tool, but as a practical solution that is rapid, efficient, user friendly, and capable of enhancing operational profitability. Importantly, when these perceived benefits exceed the associated risks, a favorable attitude is formed, which directly predicts both behavioral intention and actual usage **(**Aggarwal et al. (2023).

Furthermore, subjective norms play a pivotal role in strengthening FinTech adoption. In the contemporary business environment, SMEs are strongly influenced by external pressures from key stakeholders, including customers who prefer payments via e wallets or QRIS, suppliers who require digital transfers, competitors that have already digitalized their operations, and government initiatives that promote cashless transactions. Collectively, these social influences establish FinTech as the new standard for conducting business, thereby compelling SMEs to conform to prevailing market expectations (Baharuddin et al., 2023).

In contrast, the findings indicate that the TAM does not have a significant effect on FinTech adoption in this study. Although this result challenges conventional assumptions, it can be explained by the widespread penetration of modern technology. In the context of commonly used FinTech applications, perceived usefulness and perceived ease of use appear to have reached a saturation point.

As Bhujel (2024) observes, when users are already familiar with mobile applications, ease of use is no longer a differentiating factor but a baseline expectation. As a result, variations in user behavior are better explained by factors beyond the core TAM, including trust, security risk, and regulatory support. This perspective aligns with Sultana et al. (2023), who argue that extended TAM models incorporating risk and security considerations are better suited to explain FinTech adoption than the traditional TAM framework. In practice, SMEs are fully aware of inherent risks such as data breaches, digital fraud, and high interest rates, yet they continue to adopt FinTech because the tangible benefits substantially outweigh the potential drawbacks. Fintech offers rapid access to capital, efficient transaction processing, and payment flexibility that traditional financial institutions cannot match.

Recent studies indicate that user decisions are influenced not by risk alone, but by a strategic evaluation of risk versus reward. Adoption persists as long as the perceived financial and non-financial benefits outweigh potential threats. For example, a cross sectional study of mobile FinTech users in China by Wei et al. (2025) applied the Perceived Value Risk framework, showing that adoption intention is driven by the net perceived value, defined as the surplus of benefits over risks. When this value remains positive, users maintain their intention to adopt even in high-risk environments. Similarly, in Indonesia, Wijaya et al. (2025) examined factors affecting continued FinTech usage. Their findings revealed that perceived benefit and perceived usefulness significantly influence adoption, whereas perceived risk had no statistically significant effect. The study concluded that users prioritize utility and tangible advantages over security concerns, effectively disregarding risks when perceived benefits are substantial.

5. Discussion

Strengthening SMEs' intention to adopt FinTech is not sufficient if it only relies on the theoretical approaches of the TPB and the TAM, because the use of financial technology also often poses risks to users. Therefore, risk factors must be a major concern for FinTech users, especially SMEs.

The TPB is a psychological framework that aims to explain and predict human behavior. In relation to financial technology, the theory provides insights into users' adoption and usage behaviors. FinTech

refers to the application of technology in financial services, including activities such as mobile banking, digital payments, and peer-to-peer lending (Rusadi & Benuf, 2020). The adoption and use of FinTech platforms and services are influenced by various factors, such as perceived usefulness, perceived ease of use, trust, and social influence. The TPB helps to explain how these factors shape individuals' intentions to adopt and use FinTech.

According to the TPB, attitudes refer to an individual's overall evaluation of a behavior. In the context of financial technology, attitudes can be shaped by factors such as perceived usefulness, which is defined as the extent to which individuals believe that using FinTech will benefit them financially, enhance convenience, or improve their financial management. Attitudes may also be influenced by perceived ease of use, which refers to how easily individuals can use FinTech platforms and services (Tan et al., 2019).

Subjective norms in TPB represent the social pressures or influences that affect an individual's behavioral intentions. In the case of FinTech adoption, subjective norms may include the influence of family members, friends, or colleagues who have already adopted and used FinTech. Social norms and recommendations from trusted sources can shape individuals' perceptions regarding the appropriateness and desirability of using FinTech.

Perceived behavioral control in the TPB refers to an individual's perception of their ability to perform a behavior successfully. In the context of financial technology adoption, perceived behavioral control can be influenced by factors such as financial knowledge, technological literacy, and the availability of necessary resources, including access to smartphones and internet connectivity. Individuals who perceive a higher level of control over the use of FinTech are more likely to adopt and utilize these services.

Research studies have applied the TPB framework to examine the adoption and use of FinTech. A study by Rosengren and Bondesson (2017) investigated the adoption of mobile banking services using the TPB framework. The study found that attitudes, subjective norms, and perceived behavioral control significantly influenced individuals' intentions to adopt mobile banking. Similarly, studies that applied the TAM to the FinTech context have explored the relationships among perceived usefulness, perceived ease of use, and users' intentions to adopt and use FinTech services. These studies have provided valuable insights into the factors that influence individuals' attitudes and behaviors toward FinTech adoption.

Perceived usefulness refers to the degree to which users believe that a particular technology will enhance their performance, increase productivity, or help them achieve their goals. In the context of financial technology, perceived usefulness relates to how individuals perceive the benefits of using FinTech services, including convenience, efficiency, cost savings, access to a wider range of financial products, and improved financial management.

Perceived ease of use refers to the extent to which users believe that a technology is easy to operate and requires minimal effort or technical skills. In the context of FinTech, perceived ease of use may involve factors such as user-friendly interfaces, clear instructions, and intuitive navigation that facilitate users' engagement with FinTech platforms and services (Lee et al., 2003).

The TAM primarily focuses on individual-level technology adoption. However, the adoption and use of FinTech often involve multiple stakeholders, including financial institutions, regulatory bodies, and the broader ecosystem. This wider scope may not be adequately addressed by the traditional TAM (Ahmad, S., et al., 2021). Moreover, FinTech is a rapidly evolving field characterized by frequent innovations and the continuous emergence of new services. The traditional TAM may not fully capture the unique features and functionalities of the latest FinTech solutions, such as blockchain-based technologies, digital wallets, and decentralized finance (DeFi) platforms (Fernández-Rovira et al., 2021).

TAM was originally developed in a Western context, and its applicability across different cultures and contexts may vary. Cultural factors, such as attitudes, values, and social norms, can influence users' acceptance and adoption of FinTech differently across regions and demographic groups (Al-Gahtani et al., 2007). FinTech involves handling financial transactions and personal information, which may give rise to concerns regarding security, privacy, and potential financial risks. However, TAM might not fully capture the complex nature of perceived risk and its impact on users' acceptance of FinTech (Lin et al., 2020). Moreover, FinTech operates within a highly regulated environment, where compliance with regulatory requirements is crucial. TAM may not adequately address the influence of regulatory factors, legal frameworks, and institutional barriers on FinTech acceptance. Additionally, users' demographics, prior experience with technology, and financial literacy can affect their acceptance and adoption of FinTech. However, TAM might not adequately account for these individual differences.

The relationship between perceived risk and FinTech is an important aspect to consider when examining users' acceptance and adoption of FinTech services. Perceived risk refers to individuals' subjective assessment of the potential negative consequences or uncertainties associated with adopting and using a particular technology or service. It can manifest in various forms, such as concerns about data security, privacy breaches, fraud, financial losses, or the reliability of the technology itself. These perceived risks can influence users' attitudes and intentions toward adopting and using FinTech. Research has indicated that perceived risk plays a significant role in shaping users' acceptance and adoption behaviors in the FinTech domain. Individuals who perceive higher levels of risk are more likely to exhibit hesitation or resistance toward adopting and using FinTech services (Kapoor & Vij, 2018).

FinTech involves the use of technology to manage sensitive financial transactions and personal information. Perceived risk can influence users' trust and confidence in FinTech platforms and services. Higher levels of perceived risk may erode trust, leading to reduced acceptance and adoption of FinTech solutions. Perceived risk plays a crucial role in users' decision-making processes, as individuals tend to weigh potential benefits against perceived risks before adopting and using FinTech services. Therefore, higher perceived risk can act as a barrier, causing individuals to hesitate or reject FinTech solutions (Premkumar, 2003).

6. Conclusion

The results of this study provide robust support for the application of the TPB in strengthening the adoption of FinTech among SMEs in Indonesia, one of the developing countries. The key determinants influencing MSMEs' FinTech adoption are attitude, normative beliefs, and control beliefs. Despite the presence of perceived risks, the substantial benefits perceived by SMEs in utilizing FinTech platforms motivate them to embrace these technologies. Consequently, the findings highlight the potential for regulators to facilitate simpler and lower-risk FinTech platforms, thereby encouraging greater FinTech usage among MSMEs and enhancing the efficiency of their business operations. This research also underscores the significance of FinTech for industrial collaboration, as greater adoption among SMEs promotes smoother cooperation and development within the industry.

However, a limitation of this study lies in its focus solely on SMEs, neglecting the broader societal context where FinTech has become increasingly important. To address this limitation, future researchers are encouraged to include a more diverse sample representing the general public and to incorporate age-related criteria to yield more comprehensive and detailed insights.

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