Understanding Sustainable Fintech Adoption Across Generations in Pakistan

Waseem Subhani[1], Aima Tahir[2], Muhammad Azeem Naz[3],
Muhammad Umair Nazir[4], and Najjia Ejaz Chaudhry[5]

Abstract

This study looks into the factors influencing a person's decision to adopt financial technology. This study integrates and extends the TAM model to examine customer behavioral changes toward technological acceptance. This study examines the impact of intention to use as a dependent variable and the link between perceived ease of use and perceived usefulness and intention to use fintech in Pakistan. Furthermore, this study examines the moderating effect of perceived risk on the said relationships. This study used a quantitative research technique and acquired data using a cross-sectional design. The study surveyed Pakistani millennials and Generation Z. Google forms were used to disseminate questionnaires to bank customers in all four provinces of Pakistan. The study used Smart PLS software to test and confirm the idea. The study indicates a significant relationship between perceived ease of use, perceived usefulness, and intention to use fintech. In addition to direct relationships, perceived risk strongly moderates perceived ease of use, intention to use, perceived usefulness, and intention to use. This study contributes to the literature by combining extending TAM and analyzing its factors among Pakistani millennials. Generation Z., The study's conclusions, have ramifications for companies considering implementing both fintech products and service providers, as well as inspiring the Pakistani government to expand fintech adoption.

Keywords: Fintech, Intention to Use, Perceived Ease of Use, Perceived Risk.

Introduction

Technological advancements bring innovation and rapid development to every aspect of human life, completely altering a person's daily activities. Along with developments in everyday life, it also brings rapid development in businesses and the financial sector (Xia et al., 2023). Financial technologies (Fintech) have been introduced in the financial industry so businesses and customers can do their transactions more quickly and easily (Rahman et al., 2024). The word "Fintech" is extracted from two words, i.e., "Fin" from financial and "Tech" from technology (IMF, 2022).

[1]*Institute of Business Administration, University of the Punjab, Lahore, Pakistan.*
Corresponding Author Email: waseemsubhani@yahoo.com
[2]*Institute of Business Administration, University of the Punjab, Lahore, Pakistan. Email: aima.tahir123@gmail.com*
[3]*School of Commerce and Accountancy, University of Management and Technology, Lahore.*
Email: mazeem1297@gmail.com
[4]*The Minhaj University, Lahore. Email: umairizan@hotmail.com*
[5]*Institute of Business Administration, University of the Punjab, Lahore, Pakistan. Email:Jiyach114@gmail.com*

Instead, the Financial Stability Board (FSB) describes it as a technology that has aided in forming new business models and financial sector innovation (FSB, 2019).

Fintech helps businesses and consumers do online transactions with more security; they can directly deal with each other and easily keep track of their transactions, and their transaction costs are also meager (FSB, 2019). Banking companies and many different payment domains have rapidly shifted from cash-based to non-cash-based payment methods for much easier transactions. Other than that, there has been an increase in the trend of e-commerce and digital currencies as well (Li et al., 2023a). So, with technology development, it is essential to work on financial technology (Fintech) as well because the digital economy is considered one of the most critical factors in the growth of an economy.

It has become essential to the financial sector because of practical and constant innovations in fintech. From 2010 to 2015, almost $50 billion was invested in this industry, and only talking about 2015, there have been investments of $19 billion and nearly 12000 new startups worldwide, which are expected to grow more and more in the future (Perwitasari, 2022). After the COVID-19 pandemic, businesses have shifted more rapidly towards online business. However, it was challenging for organizations to understand consumers' perspectives to increase their intention to use Fintech products because their intention to use FinTech is still being determined (Zhang et al., 2023). Fintech services are not only about digitalizing the financial sector and e-banking. A lot more importance should be given to the consumer perspective to innovate technology after understanding their needs correctly (Ali et al., 2021).

Around the globe, fintech has reshaped how their agencies and customers perform, and on a worldwide level, the monetary sector is transferring hastily toward fintech (Irimia-Diéguez et al., 2023). However, considering Pakistan is the sixth biggest populated country in the world, its economy is still based mainly on a cash flow financial system with nearly eighty-five percent of its populace. This is due to the meager funding inside the Fintech sector (Azeem et al., 2023). According to a report, the country's total number of bank branches is also deficient; for every 10000 adults, only one branch is available in Pakistan, which is nothing compared to the average of 16.38 in Asia (Magazine Desk, 2021). It is evident that a significant portion of the population still lacks accessibility to banks and finance. In Pakistan, 80% of financial services are provided by banks, so many unbanked populations hinder them from contributing to economic activity, resulting in only 14% of financial inclusion in Pakistan (Sangarathas, 2023; Rizvi et al., 2020). Among SARC countries, Pakistan is far behind other countries in using financial technologies, and still, on a large scale, the Pakistani population uses cash for their financial payments and transactions (Imam et al., 2022) (Table 1). In this regard, this study is significant in understanding the factors behind the low usage of Fintech in Pakistan compared to other countries.

Table 1: People of SAARC Countries Using Fintech

SAARC countries	% of people using Fin-Tech for their transactions
Pakistan	10%
Bangladesh	30%
India	69%
Nepal	49%
Afghanistan	14%
Sri Lanka	64%

In the literature, many studies investigate the impact of fintech evolution on the growth of companies and the economies of different countries (Mainardes et al., 2023). However, in a developing country like Pakistan, where a large population is still not using these technologies, it is vital to understand the consumer perspective as well (Alalwan et al., 2024). To understand the technology acceptance behavior of consumers, the TAM model is used in this study, which has great importance and validity in understanding people's decision-making while using new technology (Miswanto & Nonis, 2022). Perceived ease of use and perceived usefulness are the main variables of this model (Davis et al., 1989). Perceived usefulness, according to the TAM, is the extent to which one believes that employing the technology will improve their performance (Wang et al., 2021). PE is the extent to which an individual assumes that adopting a specific system will be free from attempts and efforts (Gupta et al., 2023).

In a country like Pakistan, where the ratio of corruption and crime is higher, people are afraid to use and link their money with online devices because of its risk factors. According to Chan et al. (2022), while the type of risk in fintech and e-commerce is the same, the risk connected with both industries substantially affects their demand. So, this study investigates the impact of perceived risk as a moderator between PE, PU, and the intention of using financial technology.

Theoretical Background
TAM Model

Many theories were used in the literature of technology acceptance studies and, specifically, in the context of fintech acceptance. TRA, TPB, TAM, and UTAT are the most commonly used theories (Aldaarmi, 2024; Igamo et al., 2024; Azeem et al., 2023; Lee et al., 2023; Odei-Appiah et al., 2022). However, this study will use the integrated model of TAM, which covers the main factors that help a person in their decision-making and provides behavioral explanations about their usage intention.

Davis evolved the Theory of Reasoned Action (TRA) into the Technology Acceptance Model (Davis, 1989), which was the inaugural model to address how psychological factors impact people's adoption of technology (Davis, 1989). Through TAM, Davis (1989) created and verified better metrics for forecasting and justifying technology use. PEOU and PU are the main variables of this model.

Of all the other technology acceptance, TAM is simple to use and implement, making it better than other models. Studies from the past two decades provide substantial evidence supporting the results of TAM. According to Singleton et al. (1993), despite all the benefits a theory provides, the usefulness of the theory could be determined by examining the variance a theory can explain in predicting a human's behavior.

Perceived Ease of Use:

PE explains that a person thinks using technology will be easy and that no particular expertise is required to use it while performing tasks (Zaidi et al., 2023). Financial technology (fintech) is an innovation that makes it easier and faster for people to conduct financial transactions. Fintech depicts a broader customer population with financial services and is rapidly acquiring user bases worldwide (Alshari & Lokhande, 2022).

Trying a new technology is difficult for people because they must be hesitant. Especially in using financial technology, when a person is doing an online transaction and online investment, they are extra careful because their finance is involved in it (Sharma et al., 2024). If a person does not know how to use these technologies and finds it difficult to operate, there is a meager chance of using

fintech products or services (Alsmadi et al., 2022). A study shows that when people believe that using a particular fintech product and service is easy to use and operate, their intention and actual usage increase (Bajunaied et al., 2023).

PE was determined by the effectiveness of adopting fintech services, including evaluating the Fintech available outlook and the simplicity of using various electronic devices to access fintech services (Gupta et al., 2023). Earlier studies that related PE to technological adoption showed that PE impacts fintech use intention (Azeem et al., 2023; Zhang et al., 2023; Ashraf et al., 2022; Wang et al., 2021), but some studies show that PE does not need to help in using technology and in some studies, PE does not have significant relation on a person intention to use a fintech product or service (Chin et al., 2021; Irawan et al., 2021). As the results are mixed and the link between the PE and fintech use intention is unclear, we are further investigating this point in Pakistan and propose the following hypothesis:

H1: The perceived ease of use significantly and positively impacts the intention to use fintech.

Perceived Usefulness

The perceived usefulness of a technology is regarded as a crucial component in its adoption. Perceived usefulness, according to the TAM, is the degree of belief a user has while using the recent financial technology in growing task overall performance is known as perceived usefulness (Jafri et al., 2024; Wahga et al., 2023; Karim et al., 2022; Nurfadilah & Samidi, 2021; Davis et al.,1989). PU can also be described as a measure of what people think and how much their performance will increase by using a particular technology in performing that task (Bommer et al., 2023). With the help of fintech, the public has access to cutting-edge financial services, including online payments, financial planning, crowdsourcing, peer-to-peer financing, budgeting, savings, and more, thanks to the increase in the combination and relation of internet technology and the financial sector (Nasution et al., 2023; Xie et al., 2021). So, to use these technologies, a person needs to think that using them will be helpful for him.

When a person is trying anything new, they must be hesitant to try new things, and maybe people are not comfortable trying new things because they do not feel comfortable and try to avoid it as much as they can (Hoque et al., 2024; Noreen et al., 2022). People must think that using a particular financial technology is helpful for them and will increase their effectiveness in achieving their tasks. (Majid, 2021).

If users see how a new technology will benefit them more in their daily work, they should be motivated to adopt it. Previous studies (Davis, 1993; Venkatesh et al., 2003; Huang et al., 2022; Bommer et al., 2023; Khanet al., 2023; Majid, 2021) demonstrated that PU can play a significant role in how willing users are to adopt new technology. Previous empirical studies also revealed that if the people who use these technologies think it is more valuable, they are likely to adopt new technology like Fintech (Najib et al., 2021). However, the study of Singh et al. (2020) shows that it is not essential that perceiving technology as applicable will change the decision of a person about using it because it shows insignificant results, so this study is going to investigate this factor in this study further and propose a following hypothesis:

H2: Perceived usefulness significantly and positively impacts the intention to use fintech.

Perceived Risk as a Moderator

Perceived risk is another important reason for consumers' low intention to use fintech. Perceived risk is a user's adverse effects and ambiguity regarding a service (Ha et al., 2024). PR refers to a person's harmful consequences and uncertainty related to a Fintech service (Jangir et al., 2022).

Using a new technology is a difficult decision for a person. Especially when these technologies are related to financial transactions, people cannot start using them so quickly because their finances are involved (Shuhaiber et al., 2023). Using new financial technology is risky because a user does not believe that it is safe to use these technologies. In the past, it was seen that many people who use financial technologies become victims of fraud and do not find it safe to do a monetary transaction (Mainardes et al., 2023). This is because in financial technology, it is easy to hack the system online, and in this way, hackers can access all of a person's personal information. Hence, a person finds it risky to use financial technologies. A past study also shows that if a person believes that using a particular financial technology is risky and uncertain for them, then the usage intention and actual usage of a person decreases (Jangir et al., 2022; Xie et al., 2021).

Perceived risk has gotten much attention in the research literature on buyers' behavior toward technology acceptance (Ali et al., 2021; Ryu, 2018). In earlier studies, Al-Afeef (2024) found that the risk associated with e-commerce deters people from using the service, which lowers the adoption of fintech. According to Chan et al. (2022), while the type of risk in fintech and e-commerce is the same, the risk connected with both industries substantially affects their demand. Khamis et al. (2021) suggested that because of security and financial concerns, perceived risk is one of the most essential elements that may significantly affect adopting fintech.

In literature, many studies also use perceived risk as a moderator. Laksamana et al. (2022) and Qalati et al. (2020) found that perceived risk in online shopping moderates the relationship between trust and consumers' purchase intention. Li et al. (2023b) found that perceived risk does not moderate the relation between perceived security and the usage of online banking by customers. It has been analyzed that perceived risk moderates the relationship between the intention of using Bitcoin users and their actual behavior (Anser et al., 2020). So, it has been analyzed that perceived moderate relationships differently from different perspectives. This study will investigate the role of perceived risk as a moderator between perceived ease of use, perceived usefulness, and intention to use fintech, and it will propose the following hypothesis.

H3: Perceived risk moderates the relationship between Perceived ease of use and intention to use fintech.

H4: Perceived risk moderates the relationship between Perceived usefulness and intention to use fintech.

Figure 1: Conceptual framework
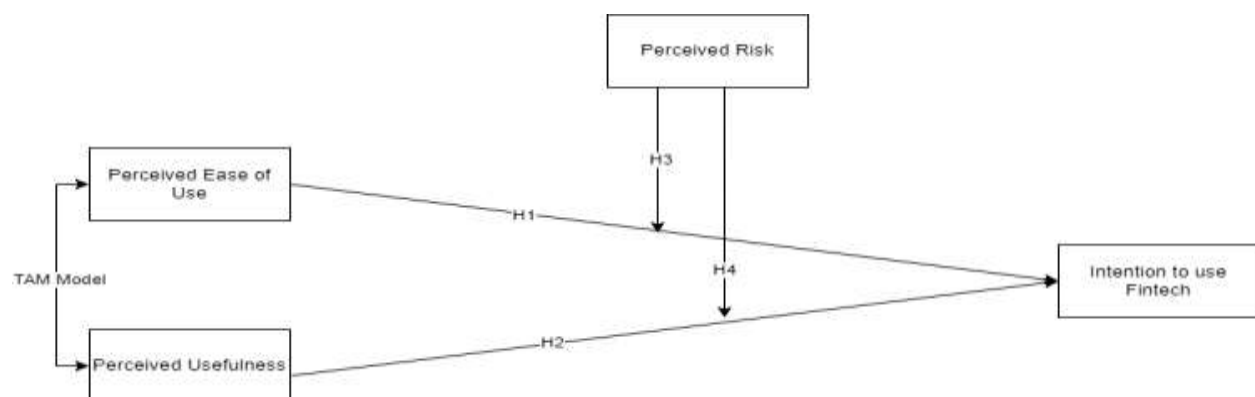
Methodology

This study aims to discover which factors influence consumers' intentions to utilize Fintech in a developing country like Pakistan. To meet the purpose of the current empirical investigation, a research model with three latent variables has been developed. To test the research model, the study employs a quantitative technique that relies heavily on data collection. This study used the cross-sectional method, with all data collected simultaneously, saving time and being cost-effective in a natural setting. The questionnaire was adapted using questions that had already been validated and used in previously published studies. The current study used an online questionnaire survey to obtain data from Pakistani Millennials and Generation Z with limited awareness of financial technologies. This study asks responders to be familiar with traditional and modern banking operations. To reach this population, bank customers were given surveys. This study used the Likert scale to operationalise each component, with items on a 5-point scale. The survey web link was distributed to bank consumers from the millennial and Gen-Z groups who needed knowledge of fintech products and services. To accurately represent data, a questionnaire was sent across all four provinces of Pakistan. Data was distributed between regions based on population ratios, allowing for easy generalisation of sample results. The questionnaires were distributed online using Google Forms. Out of the distributed surveys, 251 were returned. However, this response rate meets the minimal requirement of 140, as calculated by the G-power calculator.

There were two sections to the questionnaire. The first section dealt with the introduction and demography, while the second half covered all structures and their linked components. The perceived usefulness five-item scale was adapted from Nurfadilah and Samidi (2021), the perceived ease of use four-item scale from Nurfadilah and Samidi (2021), the perceived risk four-item scale from Chan et al. (2022), and the intention to use fintech four-item scale from Khatun and Tamanna (2021).

Data Analysis

Validity and Reliability

This study utilised Smart-PLS to analyse the model using reliability, discriminant, and convergent validity criteria (Hair et al., 2016). Composite reliability (CR) was used to evaluate internal consistency and reliability. Table 2 indicates satisfactory composite reliability since all constructs had CR values of > 0.708. AVE was employed to assess the convergent validity of all components. Table 2 reveals that all constructs have satisfactory AVE values (≥ 0.50) (Hair Jr. et al., 2017; McNeish et al., 2018).

Table 2: Reliability and Validity

Constructs	Items	Loading	CR	AVE
Intention to use	ITU1	0.89	0.91	0.77
	ITU2	0.92		
	ITU3	0.81		
	ITU4	0.91		
Perceived usefulness	PU1	0.85	0.90	0.72
	PU2	0.96		
	PU3	0.87		
	PU4	0.89		
	PU5	0.91		

Perceived ease of use	PEOU1	0.94	0.89	0.73
	PEOU2	0.91		
	PEOU3	0.93		
	PEOU4	0.83		
Perceived risk	PR1	0.95	0.95	0.84
	PR2	0.95		
	PR3	0.73		
	PR4	0.93		

Heterotrait-Monotrait (HTMT)

Discriminant validity implies that the constructs are unconnected and not reflected in each other. The study assessed discriminant validity using the Heterotrait-Monotrait (HTMT) ratio, identifying 95% of discriminant validity. Table 3 indicates that the data is discriminant-validated, as all values are below the threshold of 0.90 (Franke & Sarstedt, 2019).

Table 3: Heterotrait-Monotrait (HTMT)

	ITU	PE	PU
ITU			
PE	0.821		
PU	0.746	0.83	

Collinearity Statistics (VIF)

After evaluating the measurement model, go on to the structural model. This study also investigated multicollinearity. Table 4 demonstrates that all VIF values are less than 3.3, indicating no multicollinearity issues (Hair et al., 2018).

Table 4: Collinearity Statistics VIF

	ITU	PE	PU
ITU			
PE	2.971		
PU	2.971		

Direct Effect

Table 5 displays the direct correlations between the independent and dependent variables. The study found a significant relation between perceived usefulness and intention to use fintech (β = 0.188; t-value = 2.43, p-value $\geq$ 0.05). Also, the correlation between perceived ease of use and intention to use fintech was significant (β = 0.606; t-value = 8.718, p-value $\leq$ 0.05). This indicates that both H1 and H2 were accepted. Table 5 reveals the associated values between IVs and DV and their beta values, p-values, t-values, and decisions.

Table 5: Direct Effect

	β-value	t-value	p-value	Decision
PE -> ITU	0.606	8.718	0	Accepted
PU -> ITU	0.188	2.143	0.032	Accepted

Moderating Effect
The current study also explored the conditional effect of perceived risk between perceived usefulness and perceived ease of use towards intention to use fintech. Table 6 shows the results of the relationships, which show that perceived risk is significantly moderating among the relationships. So, the hypotheses H3, and H4 were accepted.

Table 6: Moderating effect

	β-value	t-value	p-value	Decision
PR x PE -> ITU	0.211	5.297	0	Accepted
PR x PU -> ITU	319	8.085	0	Accepted

Discussions
This study explored the relationship between perceived ease of use, usefulness, and intention to use fintech. The study also examined the role of perceived risk as a moderator. The accepted H1 reveals that customers are likely to continue with their conventional method of conducting financial transactions if the user interface of fintech goods and services is unfriendly and users need help comprehending how to use it. These results go in line with previous studies (Bommer et al., 2023; Ashraf et al., 2022; Khatun & Tamanna, 2021; Wang et al., 2021; Majid, 2021). Thus, a person will have the highest ITU fintech products and services when he/she believes using a technology is easy for him/her.
Similarly, the rejected H2 shows a significant direct relationship between perceived usefulness and intention to use fintech. This finding regarding the hypothesis states that PU has a significant relation with ITU and is in line with the findings of existing studies (Hoque et al., 2024; Zhang et al., 2023; Ashraf et al., 2022; Majid, 2021; Keng-soon et al.,2019). These results show that when users feel that using a particular technology is helpful, they have higher intentions to use the specific financial technology in Pakistan.
The moderating role of perceived risk produced a wide range of results. Some researchers propose that perceived risk moderates the relationship between PU and ITU (Jangir et al., 2022; Xie et al., 2021; Patil et al., 2020; Rastogi et al., 2018; Cho et al., 2018). Other researchers disputed the agreement above and found negligible results were perceived risk does not moderate the link between PE and ITU (Al-Afeef, 2023; Ali et al., 2021; Dwivedi et al., 2019; Ryu, 2018), claiming that all moderators do not need to be significant. However, when ITU is implemented, it is deemed to pose a high risk. If employees or stakeholders perceive risk in adopting fintech technology, they may hesitate to utilize or misuse it, resulting in diminished efficiency and production. As a result, this study investigates the moderation of perceived risk as a critical component that can influence the success of fintech's intention to use in Pakistan. We discovered a positive coefficient of perceived risk on the central hypothesis, supporting study hypotheses H3 and H4. Both hypotheses yielded significant and consistent results.

Theoretical Implications
While fintech adoption has grown in importance in recent years, more research needs to be done on user perspectives in Pakistan. Understanding the elements influencing fintech adoption is crucial for increasing it among individuals. TAM is commonly employed in technology acceptance theories; however, this study focuses on the characteristics that encourage millennials and Generation Z to utilize financial products and services more frequently. This study suggests that while TAM was previously employed to study individuals' perceptions of technology use, it could

be expanded further (Majid, 2021). This study broadens the model by including external factors such as perceived risk, enhancing its explanatory power, and providing new insights. This study suggests that while PE is essential in developing a technology, individuals should not solely rely on ease of use to adopt fintech. Individuals may initially intend to employ something other than financial technologies, but if they find them easy to use, they may use them to improve task effectiveness. According to Xie et al. (2023), the impact of public relations (PR) on an individual's intention and utilization of technology can limit their decision-making process. This study found that even if consumers have hostile intentions and see financial technology as unsafe, they will continue to utilize it for global transactions.

Practical Implications

This study's findings and conclusions have significant practical implications. The perceived usefulness of fintech products and services has a beneficial impact on intention to use. This knowledge can help fintech companies raise awareness about the benefits of financial technology. Fintech companies should focus on reducing people's perceived risk of using financial technologies. Financial companies should prioritize internet security to minimize risk and fraud during transactions. Fintech companies and banks should secure their systems to prevent hackers from accessing sensitive information, especially for large transactions and investments. Fintech companies with secure systems and proven track records should emphasize the safety of their products and services (Chan et al., 2022).

References

- Al-Afeef, M. A., Alsmadi, A. A., & Alrawashdeh, N. (2024). The Behavioral Intention of Fintech Usage: Applying Theory of Planned Behavior in Jordan. In *Digital Technology and Changing Roles in Managerial and Financial Accounting: Theoretical Knowledge and Practical Application*, *36*, pp. 15-25). Emerald Publishing Limited.
- Al-Afeef, M., Fraihat, B., Alhawamdeh, H., Hijazi, H., AL-Afeef, M., Nawasr, M., & Rabi, A. (2023). Factors affecting middle eastern countries' intention to use financial technology. *International Journal of Data and Network Science*, *7*(3), 1179-1192.
- Alalwan, A. A., Baabdullah, A. M., Al-Debei, M. M., Raman, R., Alhitmi, H. K., Abu-ElSamen, A. A., & Dwivedi, Y. K. (2024). Fintech and contactless payment: help or hindrance? The role of invasion of privacy and information disclosure. *International Journal of Bank Marketing*, *42*(1), 66-93.
- Aldaarmi, A. A. (2024). Fintech Service Quality of Saudi Banks: Digital Transformation and Awareness in Satisfaction, Re-Use Intentions, and the Sustainable Performance of Firms. *Sustainability*, *16*(6), 2261.
- Ali, M., Raza, S. A., Khamis, B., Puah, C. H., & Amin, H. (2021). How perceived risk, benefit and trust determine user Fintech adoption: a new dimension for Islamic finance. Foresight, *23*(4), 403–420. https://doi.org/10.1108/FS-09-2020-0095
- Alshari, H. A., & Lokhande, M. A. (2022). The impact of demographic factors of clients' attitudes and their intentions to use FinTech services on the banking sector in the least developed countries. *Cogent Business & Management*, *9*(1), 2114305.
- Alsmadi, A., Alfityani, A., Alhwamdeh, L., Al_hazimeh, A., & Al-Gasawneh, J. (2022). Intentions to use FinTech in the Jordanian banking industry. *International Journal of Data and Network Science*, *6*(4), 1351-1358.
- Ashraf, M., Hafeez, R., & Sajid, A. N. (2022). Factors affecting the adoption of Fin-tech in Pakistan based on the Unified Theory of Acceptance and Use of Technology Model: An empirical study on financial inclusion in Pakistan. *Journal of Financial Technologies (Fintech), Inclusion and Sustainability*, *1*(1), 9-26.

- Azeem, K., Sheikh, S. M., & Rahman, S. U. (2023). Perceived Usefulness, Experience and FinTech Acceptance in Pakistan: An Economic Analysis. *Pakistan Journal of Humanities and Social Sciences*, *11*(4), 4333-4348.
- Bajunaied, K., Hussin, N., & Kamarudin, S. (2023). Behavioral intention to adopt FinTech services: An extension of unified theory of acceptance and use of technology. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(1), 100010.
- Bommer, W. H., Milevoj, E., & Rana, S. (2023). A meta-analytic examination of the antecedents explaining the intention to use fintech. *Industrial Management & Data Systems*, *123*(3), 886-909.
- Chan, R., Troshani, I., Rao Hill, S., & Hoffmann, A. (2022). Towards an understanding of consumers' FinTech adoption: the case of Open Banking. *International Journal of Bank Marketing.* https://doi.org/10.1108/ijbm-08-2021-0397
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management science, 35*(8), 982-1003.
- Festinger, L. A. (1957). *Theory of cognitive dissonance. Row and Peterson, Evanston, IL. Fintech and the IMF.* IMF. Retrieved 2022, from https://www.imf.org/en/Topics/fintech.
- *FSB report assesses FinTech developments and potential financial stability implications.* (2019, February 14). Www.fsb.org. https://www.fsb.org/2019/02/fsb-report-assesses-fintech-developments-andpotential-financial-stability-implications.
- Franke, G., & Sarstedt, M. (2019). Heuristics versus statistics in discriminant validity testing: a comparison of four procedures. *Internet research, 29*(3), 430-447.
- Gupta, K., Wajid, A., & Gaur, D. (2023). Determinants of continuous intention to use FinTech services: the moderating role of COVID-19. *Journal of Financial Services Marketing*, 1-17.
- Ha, M. T., Tran, K. T., Sakka, G., & Ahmed, Z. U. (2024). Understanding perceived risk factors toward mobile payment usage by employing extended technology continuance theory: a Vietnamese consumers' perspective. *Journal of Asia Business Studies*, *18*(1), 158-182.
- Hoque, M. Z., Chowdhury, N. J., Hossain, A. A., & Tabassum, T. (2024). Social and facilitating influences in fintech user intention and the fintech gender gap. *Heliyon*, *10*(1).
- Huang, S. Y., & Lee, C. J. (2022). Predicting continuance intention to fintech chatbot. *Computers in Human Behavior*, *129*, 107027.
- Igamo, A. M., Al Rachmat, R., Siregar, M. I., Gariba, M. I., Cherono, V., Wahyuni, A. S., & Setiawan, B. (2024). Factors influencing Fintech adoption for women in the post-Covid-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(1), 100236.
- Imam, T., McInnes, A., Colombage, S., & Grose, R. (2022). Opportunities and Barriers for FinTech in SAARC and ASEAN Countries. *Journal of Risk and Financial Management, 15*(2), 77. https://doi.org/10.3390/jrfm15020077
- Irimia-Diéguez, A., Velicia-Martín, F., & Aguayo-Camacho, M. (2023). Predicting FinTech innovation adoption: the mediator role of social norms and attitudes. *Financial Innovation*, *9*(1), 36.
- Jafri, J. A., Amin, S. I. M., Rahman, A. A., & Nor, S. M. (2024). A systematic literature review of the role of trust and security on Fintech adoption in banking. *Heliyon*.
- Jangir, K., Sharma, V., Taneja, S., & Rupeika-Apoga, R. (2022). The moderating effect of perceived risk on users' continuance intention for FinTech services. *Journal of Risk and Financial Management*, *16*(1), 21.
- Karim, S., Rabbani, M. R., Bashar, A., & Hunjra, A. I. (2022). Fintech innovation and its application in Islamic banking from Pakistan. In *FinTech in Islamic financial institutions: Scope, challenges, and implications in Islamic finance* (pp. 157-174). Cham: Springer International Publishing.
- Khan, A. T., Kamran, R., Rehan, M. F., & Allahrakha, R. (2023). Factor Influencing Intention to Adopt Fintech in Pakistan: A Mediating Effect of Customer Attitude. *Pakistan Journal of Humanities and Social Sciences*, *11*(2), 2354-2366.

- Laksamana, P., Suharyanto, S., & Cahaya, Y. F. (2022). Determining factors of continuance intention in mobile payment: fintech industry perspective. *Asia Pacific Journal of Marketing and Logistics*, *35*(7), 1699-1718.
- Lee, C. T., & Pan, L. Y. (2023). Smile to pay: predicting continuous usage intention toward contactless payment services in the post-COVID-19 era. *International Journal of Bank Marketing*, *41*(2), 312-332.
- Li, C., Khaliq, N., Chinove, L., Khaliq, U., & Oláh, J. (2023a). Consumers' Perception of Risk Facets Associated With Fintech Use: Evidence From Pakistan. *SAGE Open*, *13*(4), 21582440231200199.
- Li, C., Khaliq, N., Chinove, L., Khaliq, U., Ullah, M., Lakner, Z., & Popp, J. (2023b). Perceived transaction cost and its antecedents associated with fintech users' intention: Evidence from Pakistan. *Heliyon*, *9*(4).
- Mainardes, E. W., Costa, P. M. F., & Nossa, S. N. (2023). Customers' satisfaction with fintech services: Evidence from Brazil. *Journal of Financial Services Marketing*, *28*(2), 378-395.
- Majid, R. (2021). The Role of Religiosity in Explaining the Intention to use Islamic FinTech Among MSME Actors. *International Journal of Islamic Economics and Finance (IJIEF), 4*(2), 207–232. https://doi.org/10.18196/ijief.v4i2.11833
- Miswanto, & Nonis, M. F. (2022). The Integration of Technology Acceptance Model (TAM) And Theory of Planned Behavior (TPB) on Online Purchase Intention of Shopee Marketplace Consumers. *Asia Proceedings of Social Sciences, 9*(1), 105– 106. https://doi.org/10.31580/apss.v9i1.2236
- Nasution, A. P., Prayoga, Y., Pohan, M. Y. A., & Siregar, Z. M. E. (2023). Adoption of Fintech by Labuhanbatu Students. *International Journal of Social Science and Business*, *7*(1), 43-49.
- Noreen, M., Mia, M. S., Ghazali, Z., & Ahmed, F. (2022). Role of government policies to fintech adoption and financial inclusion: A study in Pakistan. *Universal Journal of Accounting and Finance*, *10*(1), 37-46.
- Odei-Appiah, S., Wiredu, G., & Adjei, J. K. (2022). Fintech use, digital divide and financial inclusion. *Digital Policy, Regulation and Governance*, *24*(5), 435-448.
- Perwitasari, A. W. (2022). The effect of perceived usefulness and perceived easiness towards behavioural intention to use fintech by Indonesian MSMEs. *The Winners*, *23*(1), 1-9.
- Rahman, S. U., Nguyen-Viet, B., Nguyen, Y. T. H., & Kamran, S. (2024). Promoting fintech: driving developing country consumers' mobile wallet use through gamification and trust. *International Journal of Bank Marketing*.
- Rizvi, S. K. A., Naqvi, B., & Tanveer, F. (2020). *Is Pakistan Ready to Embrace Fintech Innovation?* Www.prdb.pk. https://www.prdb.pk/article/is-pakistan-ready-toembrace-fintech-innovation.
- Sangarathas, D. (2023). Does the current pre-experience in FinTech trigger MarTech usage behaviour? A literature review and pilot study in the context of relationship marketing. *Asian Journal of Marketing Management*, *2*(02).
- Sharma, D., & Munjal, P. (2024). Determining the key drivers of FinTech adoption in India. *International Journal of Process Management and Benchmarking*, *16*(4), 533-554.
- Shuhaiber, A., Al-Omoush, K. S., & Alsmadi, A. A. (2023). Investigating trust and perceived value in cryptocurrencies: do optimism, FinTech literacy and perceived financial and security risks matter? *Kybernetes*.
- Wahga, A. I., Majid, S., Ahmad, N., Aftab, I., & Awais, M. (2023). FinTech and Pakistan's Banking Industry: An Exploratory Study. *Journal of Policy Research*, *9*(4), 19-28.
- Wang, J., Zhao, S., Zhang, W., & Evans, R. (2021). Why people adopt smart transportation services: an integrated model of TAM, trust and perceived risk. *Transportation Planning and Technology, 44*(6), 629–646. https://doi.org/10.1080/03081060.2021.1943132
- Xia, H., Lu, D., Lin, B., Nord, J. H., & Zhang, J. Z. (2023). Trust in Fintech: Risk, governance, and continuance intention. *Journal of Computer Information Systems*, *63*(3), 648-662.

- Xie, J., Ye, L., Huang, W., & Ye, M. (2021). Understanding FinTech platform adoption: impacts of perceived value and perceived risk. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*(5), 1893-1911.
- Zaidi, S. A. M., & Shah, S. A. A. (2023). Fintech contribution towards economic prosperity in Pakistan. *Pakistan Review of Social Sciences (PRSS)*, *4*(1), 1-14.
- Zhang, W., Siyal, S., Riaz, S., Ahmad, R., Hilmi, M. F., & Li, Z. (2023). Data Security, Customer Trust and Intention for Adoption of Fintech Services: An Empirical Analysis from Commercial Bank Users in Pakistan. *SAGE Open*, *13*(3), 21582440231181388.