TPM Vol. 32, No. 2, 2025
ISSN: 1972-6325
https://www.tpmap.org/

EXPLORATION AND VALIDATION OF FINANCIAL TECHNOLOGY (FINTECH) INSTRUMENT FOR MICROFINANCE INSTITUTIONS (MFIS)

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Abstract
It is observed that Financial Technology (Fintech) has transformed the traditional system into tech-driven system to improve service accessibility, financial inclusion, and operational efficiency. This study explores Fintech instrument in Microfinance Institutions (MFIs) by compiling views, feedback and responses of practitioners of MFIs through in-depth interviews and focus groups. Thematic analysis was undertaken through NVivo for exploration of determinants and patterns that were extracted for identification of potential determinants. Moreover, a structured questionnaire was designed to collect relevant data based on extracted themes and construct that enable the researcher to validate the Fintech instrument. Results enable to propose determinants and constructs of fintech for MFIs that could help the researchers, policy makers and other stakeholders by designing potential Fintech strategies to mitigate emerging issues and concerns.
Keywords: Fintech Instrument, Validation, Microfinance Institutions (MFIs), Thematic analysis

1. INTRODUCTION

Digitalisation affected the demographic profile and transformed the individual and corporate affairs because of technological developments (Choi, Han, & Lee, 2024). It is reported that financial sector has been facing challenges due to globalization and internalization (Rabbani, Kayani, Bawazir, & Hawaldar, 2022). The global fintech population and its devastation in financial services clearly predicts disruptions in the MENA region, notably in the customer and product categories (Zalan & Toufaily, 2017). Fintech internationalization has revolutionary potential in developing nations where the banking system is in its early phases and there is a lack of financial inclusion. World Bank reported that 76% of global adults possess bank accounts including 71% in developing countries and 53% in MENA region (Bank, 2021; Demirgüç-Kunt, Klapper, Singer, & Ansar, 2022). SBP in 2023 estimates the banking penetration is still as low as 36% among adults (SBP, 2025). A significant positive association is noticed between financial inclusion and Fintech adoption in the presence of Fintech and financial inclusion (Badra, Jain, & Vichore, 2025; San Andres & Hernando, 2019). Fintech has transformed financial services through provision of innovative solutions. Fintech incorporates a wide variety of innovation, including peer-to-peer lending, AI driven digital and financial solutions, and digital banking (Harsono & Suprapti, 2024). It deals with various technical issues, such as scalability, privacy, security, interest, interoperability, consumption of energy, societal trust, moral issues, environmental consequences, and regulatory controversies, including the possibility of illegal activity. Therefore, sustainable development is critical to overcome these barriers and enabling widespread use of technologies (W. Liu, Zhou, & Li, 2025).

Exploring and evaluating fintech instruments is crucial for financial institutions, governments, and cutting-edge technology companies for growth. Fintech covers technological factors (e.g., cyber security, digital infrastructure), consumer related factors (e.g., perceive ease of use, trust), regulatory framework, and economic conditions (e.g., market competition, income level) (Balaskas, Koutroumani, Komis, & Rigou, 2024; Gomber, Koch, & Siering, 2017). Some studies investigated payments, digital currencies, investment, risk management, and regulatory technologies perspective (Baker, Filbeck, & Black, 2024; Haddad & Hornuf, 2019; Lee & Shin, 2018). But only few studies have proposed coherent and consensual fintech definition (Haddad & Hornuf, 2019; Rani & Kumar, 2024), while other researchers observe impact of fintech on traditional entrepreneurial practices (Milian, Spinola, & de Carvalho, 2019), and pointed out its implications in financial system (Zarrouk, El Ghak, & Bakhouche, 2021) including refinement of an instrument in the presence of "perceived ease of use, and perceived usefulness" (Davis, 1989; Venkatesh, Morris, Davis, & Davis, 2003), but these studies concentrate on technology acceptance. Most of the studies do not fully encompass the viewpoints of fintech adoption and application in MFIs. Therefore, a need to propose an instruments is more evident for specific contexts that might improve contextual relevance and content validity in fintech adoption (J. F. Hair, 2009; Straub, Boudreau, & Gefen, 2004). Therefore, this study explores determinants of Fintech for MFIs through a scientific and systematic process. This study adopted

multidisciplinary approach, and integrate insights from “Technology acceptance model (TAM)” (Davis, Bagozzi, & Warshaw, 1989), and “innovation diffusion theory (IDT)” (Miller, 2018) to provide comprehensive understanding related to fintech adoption.

2.0 LITERATURE REVIEW

Fintech has transformed the financial institutions by increasing inclusivity, accessibility, and efficiency (Arner, Barberis, & Buckley, 2015). Fintech indicates a combination of finance, technology management, and innovation (Q. Liu, Chan, & Chimhundu, 2024) and could increase services diversification, reduce cost, and optimize industrial conditions (Khan, Nouman, TENG, Khan, & Jadoon, 2017; Murinde, Rizopoulos, & Zachariadis, 2022). The study explores the determinants of fintech to validate its instruments by considering innovation, technology, digital finance, security, regulatory environment, market competition, and consumer behaviour for MFIs.

2.1 Theoretical Foundation

2.1.1. Innovation Diffusion Theory

Miller (2015); E. Rogers (1962) proposed the theory of innovation diffusion based on academic efforts of Rogers (1962) by reporting the occurance of innovation through a certain mechanism transmitted along specified channels in a social system over time, and associated with a new idea of reporting in other readings i.e. (Prescott, 1995; E. M. Rogers, 1995)It enables to identify factors such as observability, compatibility, trialability, and complexity. However, all these factors influence the extent and intensity of technological adoption (E. M. Rogers, Singhal, & Quinlan, 2014). MFIs can use fintech to enhance productivity, boost outreach to un-served population, and enhance service availability to promote digital financial inclusion (Sangwan, Nayak, Sen, & Sangwan, 2023).

2.1.2. Technology Acceptance Theory (TAT)

Davis (1989), introduced technology acceptance theory (TAM) by indicating "perception of usefulness" and "perception of ease of use" that could influence technology adoption Sulistiyarini (2012). TAM includes “ease of use”, Perceive usefulness”, “attitude”, behavioural intension to use technology”, and the “actual use”. The utilization of technology regularly could increase performance; deliver user-friendly tech-solutions and boost financial literacy for financial services.

2.1.3. Unified Theory of Acceptance and Use of Technology (UTAUT)

Unified Theory of Acceptance and Use of Technology (UTAUT) represents a collection of performance expectancy, hedonic motivation, effort expectancy, social influence, habits, and enabling conditions (Venkatesh, Thong, & Xu, 2012). Moreover, revised version of UTAUT model incorporated employee acceptance and utilisation of technologies, while considering overall purpose of organisations (Jahankhani et al. (2017). Similarly, performance expectations helps in widespread use of mobile banking (Yaseen, El Qirem, & Dajani, 2022), internet banking and fintech (Mohd Thas Thaker, Allah Pitchay, Mohd Thas Thaker, & Amin, 2019). In addition, habits and facilitating conditions also increases fintech adoption (Maniam, 2024).

2.2. Perceived Usefulness (PU) and Perceived Ease of Use (PEU)

Perceived Usefulness (PU) describes the user’s belief related to advantages and effectiveness of using financial technological solutions to increase financial management (Davis, 1989). It is reported that perceived benefit of fintech application could help to create favourable feelings among users regarding convenience, efficiency and better decision making by adopting latest technologies (Subhani, Tahir, Naz, Nazir, & Chaudhry, 2024). Similarly, Perceived Ease of Use (PEU) could help users regarding strong perception towards ease of use that could lead to loyalty and satisfaction for fintech adoption by reinforcing benefits of fintech to users (Amnas, Selvam, Raja, Santhoshkumar, & Parayitam, 2023; Kumar & Rani, 2024). PEU indicates that technology is simple to use and no extra expertise is required while performing the tasks (Zaidi & Shah, 2023). Fintech could make it easier for users to do financial transactions (Alshari & Lokhande, 2022) because manual activity could be difficult for users while making financial transactions (Jangir, Sharma, Taneja, & Rupeika-Apoga, 2022).

2.3. Technology as Fintech Determinant

Financial technology and issues resulting from its acceptance, development, and application in financial sector are factors for technological adoption. These factors requires adopting of modern financial technologies to mitigate the emerging challenges (Lavrov, 2011). It necessitates the fintech due to Neural networks (Rivas, Parras-Gutiérrez, Merelo, Arenas, & García-Fernández, 2017); IoT, Artificial Intelligence (AI) observed by (Schulte & Liu, 2018), and bitcoin hardware evaluation (Agarwal, Gill, Upadhyay, Dangi, & Chythanya, 2024). Technology is an essential element of fintech by improving user experience and streamlining financial transactions. Therefore, big data analytics, artificial intelligence, and block chain could play a significant role in the security and efficiency of financial services (Singh, Sajid, Gupta, & Haidri, 2022).

2.4. Innovation as Fintech Determinant:

Financial innovation is essential to encourage the creation of innovative financial and non-financial products and services such as P2P lending, decentralized finance, digitization, and robo-advisor services, which have altered established financial institutions. Innovation can turn traditional techniques into the latest through disruptive innovation, acquisition, and tactics. With disruptive innovation institutes can differentiate from other traditional financial institutions with their updated niche services, easy to understand organizational forms, innovative culture and output driven system. The emergence of open banking improves association between fintech enterprises and banks, which increases access to financial services (Siek & Sutanto, 2019). Fintech enterprises use technology for

payments, personal finance, capital market, and financial data management. Fintech enterprises use technology for payments, personal finance, capital market, and financial data management (Giaretta & Chesini, 2021).Fintech set-ups have used digital transformation strategies and cutting-edge approaches to fulfill the needs of their customers (Gomber et al., 2017; Qu, Chen, Wang, Yang, & Zhang, 2025). Identity verification and smart contracts has increased transparency and efficiency of financial transactions (Rahman, Titouna, & Nait-Abdesselam, 2025).

2.5. Perceived security as Fintech determinants:

Fintech adoption is based on security to prevent data from cyber security threats, and fraud prevention, that is essential for financial institutions (Oladinni & Odumuwagun, 2025). Strategic partners including the government and software developers play vital role in tackling cybercrime to control cyber security crimes such as common sense and investment in anti-virus software, still, cybercrimes activities are exists (Balan, Otto, Minasian, & Aryal, 2017). It is observed that plans, techniques, and methods have developed to mitigate information system risks, cybercrime actions to increase financial institution operation (Kopp, Kaffenberger, & Jenkinson, 2017). Regulatory technology adoption plays a major role in risk mitigation (Von Solms, 2021). Similarly, regulatory compliance, end-to-end encryption, and biometric authentication ensures fintech system integration (Deb, 2025).

2.6. Financial Inclusion and Digital Finance

Digital finance describes how financial institutions are becoming progressively digital. It comprises of all digital product & services of financial institutions, such as, home banking, trading services, chip cards, credit cards, billing, remittances, exchange system, app services and also ATMs (Bank, 2021). Digital finance provides accessibility to banking services through credit and payment services, that are otherwise not reachable where services of "prepaid" payments are not online (Rizzo, 2014). Although few digital services are fully established includes, ATMs that are more novel, less disruptive for financial institutions; including mobility (mobile banking, self-service, and mobile banking) incorporates both secure systems and biometric verification (Briere, Oosterlinck, & Szafarz, 2015).

3.0. RESEARCH METHOD

This study aims to explore and validate a fintech instrument for the MFIs based on existing literature, expert opinion and by approaching the relevant stakeholders. It explores the determinants of fintech by an "exploratory sequential mixed-method design" grounded in pragmatism (Clark & Creswell, 2008), where qualitative in-depth interviews were conducted in first step to gain insight into participants' perspectives to develop a structured instrument for the quantitative phase. Data was analyzed through Exploratory Factor Analysis (EFA) by compiling views/opinion through in-depth interviews of 16 professionals working with microfinance institutions (MFIs) who are engaged in fintech related activities. Moreover, focus groups were conducted as per protocol & procedure mentioned in the existing literature (Guest, Bunce, & Johnson, 2006; Marshall, Cardon, Poddar, & Fontenot, 2013; Sheth, Jain, Roy, & Chakraborty, 2022) until the saturation point. The interviews and focus groups have been recorded and transcribed prior to design a structured questionnaire in English. The questionnaire was translated into Urdu and back-translation was carried out under the supervision of language experts. It enables researchers to collect data through structured questionnaires to produce 235 valid responses that were processed for data analysis from relevant persons who are working in MFIs in the selected part of Pakistan. Purposive sampling technique was used to identify the potential respondents that followed snowball sampling technique for data collection from professionals of MFI who have knowledge about the major fintech activities in MFIs.

4.0 DATA ANALYSIS & RESULTS

Data analysis was undertaken in two phases i.e. firstly qualitative tools were applied to finalize constructs/determinants of the fintech based on available facts; secondly quantitative tools were used to extract the coefficients for the validation of the fintech instrument with the help of data collected by structured questionnaire. Qualitative data analysed using NVivo 10 software, through thematic analysis, coding, tree map, word tag cloud, and word tree to derive and verify themes (Braun & Clarke, 2006).

4.1. Qualitative Study Finding:

4.1.1. Word Tag Clouds

Word tag clouds indicate different sizes of words according to frequency or concepts in nodes and source through NVivo that is evident from Figure 1. These are most important themes of study include security, services, financial, technology, digital, innovation, banks, information, platforms, mobile, apps, online, risk, and data.

Figure 1. Word Tag Cloud

TPM Vol. 32, No. 2, 2025
ISSN: 1972-6325
https://www.tpmap.org/

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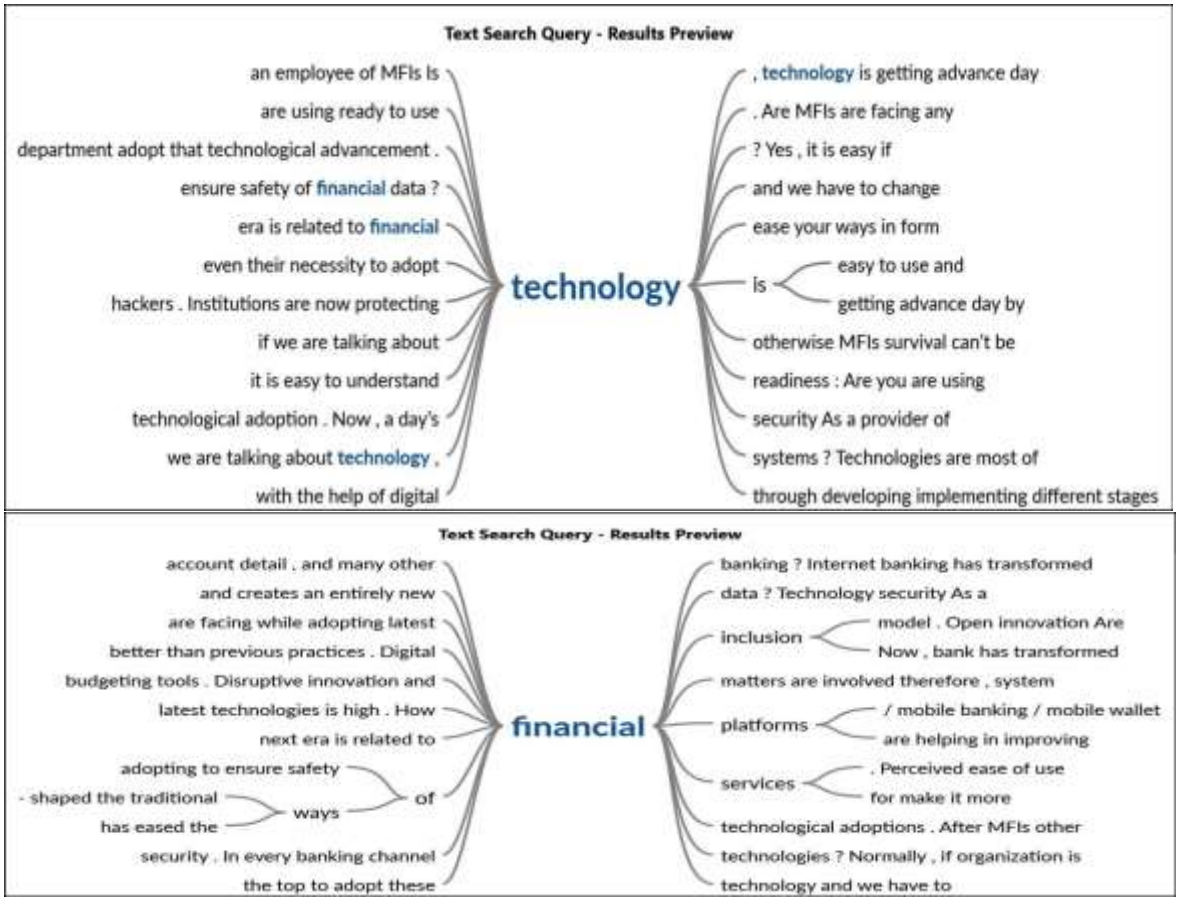
4.1.2. Analysis of Word Tree

Figure 2 shows word tree of word "financial" and "technology" that reveals the most important words based on in-depth interviews and focus groups of MFIs Professionals.

Figure 2.Test search query of word "Financial" & "Technology"



4.1.3. Tree Map Analysis

Tree map represents worth and significance of each theme indicated in Figure 3 that major determinants of fintech i.e. PEU, PU, user design interface, perceived security (information security, app security, technology security, network security, and smartphone security), innovation (product innovation, process innovation, open innovation, disruptive innovation, and sustainable innovation), technological readiness (absorption capacity), digital finance (digital financial platforms, internet banking, mobile banking, online banking, mobile wallet), and perceived risk (credit risk). In three map, more critical determinants occupy larger regions as compared to those are smaller. Digital Finance, Cyber-security, innovation, technological readiness, and perceived risk are now currently under focused as compared to user design interface, PU, & PEU.

Figure 3 Tree Map Analysis

4.2. Quantitative Phase

The output of Qualitative analysis enables researchers to identify the items related to determinants i.e. PEU, PU, PS, IC, TR, and digital finance. Consequently, six determinants of fintech items were extracted. The SPSS has also been utilized for quantitative measurement of the instrument's reliability and validity. Determinants and items

developed are placed in Table 1 as an outcome of qualitative analysis undertaken based on responses of relevant experts and professionals.

Table 1. Items of instrument

Determinants	Items Modified/ Developed
Perceived Usefulness	Fintech enables your MFI for convenient operations.
	Fintech enables your MFI for reliable operations.
	Fintech enables your MFI for fast operations.
	Fintech enables your MFI to ensure availability of all operations.
Perceived Ease of use	Mobile Apps of your MFI are user-friendly and guide your customers
	Fintech enables your stakeholders to perform their duties with ease and clarity
	Your Microfinance institution's mobile payment apps are user friendly through Fintech
	Fintech enables your MFI to perform secure operations.
	Your Microfinance institution's mobile payment menus are easy to navigate through Fintech
Perceived Security	Fintech enables your MFI to maintain secrecy and confidentially of user data.
	Fintech enables your MFI to ensure authentication of stakeholders.
	Fintech enables your MFI to secure operations through multiple digital financial platforms.
	Fintech enables your MFI to maintain and repair multiple digital financial platforms.
	Fintech enables your MFI for appropriate response, guidance, and follow-up
	Fintech enables your MFI to provide network security.
Innovation & compatibility	Fintech enables your MFI to provide quality and competitive products.
	Fintech enables your MFI to boost the institution image and brand awareness.
	Fintech enables your MFI to improve process and efficiency of operations.
	Fintech enables your MFI to improve use of latest technology
	Fintech enables your MFI to adopt innovation as per changing environmental situations
	Fintech enables your MFI to adopt emerging trends and technologies according to emerging trends.
	Fintech enables your MFI to transform previous traditional practices from traditional to modern practices.
	Fintech innovations enable MFI to offer more accessible and faster services
	MFI focuses on both sustainability and innovation through fintech to meet customer needs
Technological Readiness	Fintech enables MFI for technological adoption to make operations more smooth, efficient, and user friendly
	It enables MFI to increase productivity and manage tasks through better services quality.
	MFI are the initiators to explore and implement latest digital tools at institutions
	MFI prefer to verify physical documentations with electronic transactions for accuracy
	It transforms the manual information & operations to electronic/digital information & operations for accuracy and cross verification
	MFI are often felt difficult to understand digital financial platform
	Fintech enables your MFI to integrate existing technology into emerging technologies to work more effective.
	Fintech enables your MFI to upscale human capital/ stakeholders for appropriate use of readily available technology.
	Fintech enables your MFI to apply new knowledge and skills in offering products/services.
	Fintech enables MFI to absorb new knowledge as well as to prepare it for further purposes and to make it available.
	Fintech increases ability of MFI to work more effective by adopting new technologies.
Digital Finance/ Digitalization	Fintech enables to provide digital operations and products in an effective and efficient manner.
	Fintech enables MFI to provide internet banking, and mobile banking services to users to manage financial transactions
	Fintech enables MFI to provide secure digital financial operations using mobile wallets and others

	Fintech enables your MFI to support external platform in adoption of digital platforms.
	Fintech enables your MFI to atomize the digital operations
	Fintech enables your MFI to automate the digital operations to increase operational efficiency, decision making, and timely services delivery.

Source: Generated

4.2.1. Content Validity Test

The content validity of instrument was checked with the help of seven content specialists who were approached and four out of seven are the part of management of MFIs and three specialists/experts from the top universities of Pakistan who have an ample experience and competences. Experts analysed and provided feedback on research instrument by considering the proposed items. It is recommended that CVI (content validity index) computed at scale level (S-CVI) and item level (I-CVI). Instrument shows content validity consistent with (S-CVI ≥ 0.8; I-CSV ≥ 0.78) recommended threshold and considered satisfactory (Polit & Beck, 2006). Table 2 revealed that content validity considered satisfactory.

Table 2. CVI Analysis of Instrument

Item Code	E-1	E-2	E-3	E-4	E-5	E-6	E-7	No. Of agreements	Items of CVI
PU1	P	P	P	P	P	P	P	7	1
PU2	P	P	P	P	P	P	P	7	1
PU3	P	P	P	P	P	P	P	7	1
PU4	P	P	P	P	P	P	P	7	1
PEU1	P	P	P	P	P	P	P	7	1
PEU2	P	P	P	P	P	P	P	7	1
PEU3	P	O	P	P	O	P	P	5	.71
PEU4	P	P	P	P	P	P	P	7	1
PEU5	P	P	P	P	P	P	P	7	1
PS1	P	P	P	P	P	P	P	7	1
PS2	P	O	P	P	P	O	P	5	.71
PS3	P	P	O	P	P	P	O	5	.71
PS4	P	P	P	P	P	P	P	7	1
PS5	P	P	P	P	P	P	P	7	1
PS6	P	P	P	P	P	P	P	7	1
IC1	P	P	P	P	P	P	P	7	1
IC2	P	P	P	P	P	P	P	7	1.
IC3	P	P	P	P	P	P	P	7	1
IC4	P	O	P	O	P	O	P	4	.57
IC5	P	O	P	P	O	P	P	5	.71
IC6	P	P	P	P	P	P	P	7	1
IC7	P	P	P	O	P	P	O	5	.71
IC8	P	O	O	P	P	P	P	5	.71
IC9	P	P	P	P	P	P	P	7	1
TR1	P	P	P	P	P	P	P	7	1
TR2	P	P	P	P	P	P	P	7	1
TR3	P	P	O	P	P	O	P	5	.71
TR4	P	P	P	O	P	O	P	5	.71
TR5	P	P	P	P	P	P	P	7	1
TR6	P	O	P	O	P	P	O	4	.57
TR7	P	P	P	P	O	O	P	5	.71
TR8	P	P	O	P	P	P	O	5	.71
TR9	P	P	P	P	P	P	P	7	1
TR10	P	P	P	O	P	O	P	5	.71
TR11	P	P	P	P	O	P	O	5	.71
DF1	P	P	P	P	P	P	P	7	1
DF2	P	O	P	P	O	P	P	5	.71
DF3	P	P	P	P	P	O	O	5	.71
DF4	P	P	P	P	P	P	P	7	1
DF5	O	P	P	P	P	P	O	5	.71
DF6	P	P	P	P	P	P	P	7	1

	40	34	37	36	36	34	34	Mean I-CVI	0.87
Portion Relevance	0.98	0.83	0.90	0.88	0.88	0.83	0.83	*S-CVI/AVE*	0.87
No. of items before CVT			*No. of items after CVT*				*Num of items dropped*		
41			*24*				*17*		

4.2.2. Construct Reliability

Instrument reliability expressed through Cronbach alpha indicating the criteria of minimum Cronbach alpha presenting the acceptable value is 0.70 (J. F. Hair, 2014; Povinelli & Henley, 2020; Yao, Lim, Guo, Ou, & Ng, 2022). Therefore, if the value is 0.7 or higher, it indicates that developed instrument is considered reliable that is reflected in Table 3

.

Table 3. Construct Reliability Analysis

VAR	**No. of Items**	**Cronbach's Alpha**
PEU	4	0.847
PU	4	0.848
PS	4	0.835
IC	5	0.850
TR	4	0.850
DF	3	0.823

Source: Generated

4.2.3. Exploratory Factor Analysis (EFA)

Exploratory factor analysis used for refinement of measurement instrument along with tests undertaken to check data adequacy including Bartlett's test of sphericity (Churchill Jr, 1979) and Kaiser–Meyer–Olkin statistic indicating values $0.786 > 0.50$, $p < 0.001$ presented in Table 4. It reflects that sample is adequate for factor analysis, indicates low uniqueness and high variance (J. Hair, Black, Babin, Anderson, & Tatham, 2010). It is reported that items with factor loads of 0.4 or higher are considered appropriate (Kaiser, 1960). If the value exceeds 0.55, it is deemed more significant. Table 5 reflects EFA extracting six fintech determinants i.e. "perceived ease of use", "perceived usefulness", "perceived security", "innovation and compatibility", "technological readiness", and "digital finance".

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.786
Approx. Chi-Square	2355.297
Df	276
Sig.	.000

Table 5 Rotated Factor Matrix

	1	2	3	4	5	6
PEU1			.733			
PEU2			.821			
PEU3			.742			
PEU4			.748			
PU1				.750		

PU2				.752		
PU3				.743		
PU4				.786		
PS1					.751	
PS2					.742	
PS3					.763	
PS4					.737	
IC1	.748					
IC2	.734					
IC3	.712					
IC4	.715					
IC5	.713					
TR1		.750				
TR2		.733				
TR3		.818				
TR4		.760				
DF1						.806
DF2						.795
DF3						.745

A final version indicating the determinants and items developed are placed in Table 6 as an outcome of qualitative analysis and quantitative analysis undertaken based on responses of relevant experts and professionals and respondents. Data was collected through structured questionnaires to produce 235 valid responses that were processed for data analysis from relevant persons who are working in MFIs in the selected part of Pakistan.

Table 6. "Key determinants and their Instrument"

Fintech Determinants		
Determinants		**Items of Instrument**
Perceived Usefulness	PU1	Fintech enables your MFI for convenient operations.
	PU2	Fintech enables your MFI for reliable operations.
	PU3	Fintech enables your MFI for fast operations.
	PU4	Fintech enables your MFI to ensure the availability of all operations.
Perceived Ease of use	PEU1	Fintech of your MFI is user-friendly and guide your customers
	PEU2	Fintech enables your stakeholders to perform their duties with ease and clarity
	PEU3	Fintech enables your MFI to perform secure digital financial operations.
	PEU4	Fintech enables your MFI's mobile payment apps menus easy to navigate.
Perceived Security	PS1	Fintech enables your MFI to maintain the secrecy and confidentiality of stakeholders and data.

	PS2	Fintech enables your MFI to maintain and update digital financial platforms regularly.
	PS3	Fintech enables your MFI for appropriate response, guidance, and follow-up
	PS4	Fintech enables your MFI to provide network security.
Innovation and compatibility	IC1	Fintech enables your MFI to provide quality and competitive products.
	IC2	Fintech boosts the institution's image and brand awareness.
	IC3	Fintech improves the process and efficiency of operations.
	IC4	Fintech enables your MFI to adopt emerging trends and technologies according to emerging trends.
	IC5	MFI focuses on both sustainability and innovation through fintech to meet customer needs
Technological Readiness	TR1	Fintech enables MFI for technological adoption to make operations more smooth, efficient, and user friendly
	TR2	Fintech enables MFI to increase productivity and manage tasks through better services quality.
	TR3	Fintech transforms manual information & operations to electronic/digital information & operations with accuracy and reliability
	TR4	Fintech enables your MFI to apply new knowledge and skills in offering products/services.
Digital Finance/ Digitalization	DF1	Fintech enables MFI to provide digital operations and products in an effective and efficient manner.
	DF2	Fintech enables your MFI to support external platforms in the adoption of digital platforms.
	DF3	Fintech enables your MFI to automate the digital operations to increase operational efficiency, decision making, and timely services delivery

5. CONCLUSION:

This study investigated and validated fintech instruments for MFIs by using a mixed method approach. Qualitative and quantitative data was used to apply the relevant analysis. NVivo was applied for thematic analysis to explore determinants and patterns, which were then extracted to identify potential determinants. Researchers have conducted in-depth interviews, focus groups and then used a structured questionnaire in English & Urdu language to compile the responses of the relevant experts, professionals and practitioners. Findings indicate determinants of fintech i.e. Perceived Ease of Use; Perceived Usefulness; User design interface; Perceived security (information security, app security, technology security, network security, and smartphone security), Innovation (product innovation, process innovation, open innovation, disruptive innovation, and sustainable innovation), technological readiness (absorption capacity), digital finance (digital financial platforms, internet banking, mobile banking, online banking, mobile wallet), and perceived risk (credit risk). Quantitative tools enable to extract multidimensional aspects of determinants proposed in qualitative research, ensuring construct validity and reliability. This study could be helpful for the stakeholders, MFI's professionals and others to apply the proposed fintech instruments for MFIs and other institutions.

6. Limitations, future directions, and implications:

This study represents significant contribution in literature regarding the determinants of fintech and instrument validation, however, there are some limitations as it is largely based on MFIs. Although the research contributes to the literature in fintech perspective, future research can include fintech set-ups from other countries, in order to determine how it is influenced by findings, regulations, business environment, and economic conditions. For in-depth review, future researchers can explore more fintech determinants, with mixed method studies. Findings of this research could be used in more diverse sample, with CFA "confirmatory factor analysis" and may also investigate causal relationship with other variables through SEM "Structure equation modelling". Additionally, in future researcher can investigates these determinants with performance of institutions within a comprehensive model. These results are valuable to policymakers, developers, and financial institutions in the fintech perspective, to develop policies that promotes financial inclusion, enhance cyber security, and create an environment encouraging to innovation in fintech based services and eventually form a more secure, efficient, and sustainable fintech ecosystem.

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