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Impact of Customers' Demographics on their Attitudes and Intentions to Adopt FinTech for Banking Services: TAM-Based Explanation

[1]Nisar Ahmad, [2]Bilal Nafees & [3]Ayesha Sabir
[1] Associate Professor, Hailey College of Commerce, University of the Punjab, Lahore, Pakistan.
[2] Assistant Professor, Division of Management and Administrative Sciences, UE Business School, Lower Mall Campus, University of Education, Lahore, Pakistan.
[3] Research Scholar Hailey College of Commerce, University of the Punjab, Lahore, Pakistan

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ABSTRACT

FinTech is being used to improve customer service in response to increased demand for financial digital services in the banking industry. However, customers' fear of using FinTech varies across demographics, like age, gender, education, and income. This study focused on the Technology Acceptance Model (TAM) to explain the effects of customers' demographics and the mediating effect of trust, risk, perceived ease of use (PEOU) and perceived usefulness (PU) of FinTech and customers' attitudes on the banks' customers' intention to adopt FinTech. For collecting data, a structured questionnaire was shared among the 1000 bank customers through a Google form link. After discarding incomplete or wrongly filled questionnaires, the final sample of 455 responses was analyzed in smart PLS. The structured equation model (SEM) analysis reveals that customers' intent to utilize FinTech in the banking industry is significantly influenced by their attitude toward FinTech. The results also establish a significant impact of age, income, education, PEOU, PU, trust, and risk on the customers' attitudes toward adopting new FinTech services. Moreover, SEM analysis shows that PEOU, PU, Trust, and risk mediate the relationship between the customers' demographics and their attitude toward using FinTech services. The findings of this study support the TAM postulates and suggest the policymakers to consider the demographic impact on the use of FinTech services and focus on developing more user-friendly and secure FinTech interfaces.

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1.0 Introduction

Fintech is a contemporary technical breakthrough in financial services (Wausups, 2017). New Generations Z and Alpha are eager to use technology in food delivery, taxi service, online shopping, booking airline tickets, and other services via computers or possibly mobile phones (Karsh, 2021). Electronic and mobile technologies are being used in financial services like borrowing, investing, and paying for products and services safely (Diana & Leon, 2020). Users can perform numerous financial activities with these digital wallets, such as peer-to-peer transfers, bill payments, and cell top-ups. Traditional banks in Pakistan are investing in Internet banking platforms to give users easy access to financial services.

The State Bank of Pakistan (SBP) has actively promoted digital banking programmers to increase financial inclusion and accessibility. Pakistan has around 160 million biometrically confirmed mobile connections (about 68% of the population possesses a mobile phone) and 58 million mobile wallet accounts. Customers can apply for loans online through digital lending platforms, and credit scoring algorithms help analyze applicants' creditworthiness. Given the rising reliance on digital channels, cybersecurity is a top priority for banks. Some theories and models like the theory of reasoned actions (TORA) proposed by Fishbein and Ajzen in 1977 and the technology acceptance model (TAM) developed by Davis et al. in 1989, explain the fundamental variables that influence customers' attitudes toward FinTech (Chuang et al., 2016). It is important to know the influence of customers' demographic attributes (like education, age, income, and gender) on their attitudes and intentions to use modern digital technologies like online banking, smartphones, etc. Studies have shown that a person's education affects the use of different technologies.

FinTech adoption is higher in developed countries, stemming from the availability of more advanced digital infrastructures to people. Consequently, people have wider access to financial services in these countries (EY, 2017; Frost, 2020). It is well-established that modern digital technology plays a pivotal role in the performance and growth of the financial industry (Habibi & Zabardast, 2020). Despite this, the LDCs are behind in the global digital transformation race. The population structure in developing countries indicates a high proportion of younger cohorts. In 2020, thirty-nine percent of the population in the lower-income countries was under fifteen years. A woman is not free to use and own a mobile phone. Women have restricted access to digital technology in developing countries, limiting them from fully benefiting from digitalization (United Nations, 2021).

Like other developing countries, Pakistan has various problems such as limited access of people to technology and financial services, which may have a more crucial impact on FinTech adoption. Access to numerous digital solutions is less common for women than for males (United Nations, 2021). The adoption of FinTech services seems influenced by customers' demographics like age, gender, income, and education. However, little attention is paid by earlier studies to the demographic attributes of customers in determining the adoption of FinTech services in developing countries. Therefore, this study aims to highlight the determinants of customers' intentions to use FinTech for banking services in Pakistan. The study is focused on establishing

the effect of demographic characteristics, particularly education, age, income level, and gender of customers on their attitude toward FinTech and intention to use FinTech services. Like Meyliana et al. (2019), this study engaged the TAM model to highlight the mediating role of trust, risk, perceived ease of use, and usefulness of technology. Based on the research agenda following research questions are investigated.

What is the relationship between the demographics of customers (age, income, education, gender) and their attitude toward the adoption of FinTech?

What is the relationship of the demographics of customers (age, income, education, gender) with PU, PEOU, trust, and risk?

Do the demographic attributes of customers have a significant impact on their attitudes toward adopting FinTech for banking services?

What is the impact of PU, PEOU, trust, and risk on attitude towards FinTech for banking services?

Does PU, PEOU, trust, and risk mediate the effect of the demographic attributes of customers on their attitude toward FinTech for banking services?

What is the effect of customers' attitudes on the intention to use FinTech for banking services?

This study establishes a significant impact of the demographic attributes (particularly education, age, income level, and gender) on the customers' attitudes and their intention to adopt FinTech for availing financial products and services in Pakistan. The findings of the study suggest that policymakers should consider the demographics of customers while introducing digital financial services and related e-interface tools that affect FinTech adoption in Pakistan. The study findings are useful for financial institutions to design a roadmap and create FinTech services that satisfy all the needs and preferences of their customers.

After describing the motivation for the study and research questions in the introduction section, hypotheses are developed in section 2. Section 3 briefs the data and methods employed to test the hypotheses. The results of the analysis are reported in section 4. Section 5 summarizes the findings of the study, managerial implications, and limitations of the study.

2.0 Literature Review

The purpose of the literature review is to develop hypotheses for testing the effect of demographic factors on consumer attitudes toward using FinTech services in the banking industry. Younger customers perceive FinTech services as more user-friendly and creative. Likewise, customer attitude towards FinTech services is positively related to income and education levels. Customers with higher income and education levels are more inclined to view trusted FinTech services (Kaatz, 2020c). Gender has also been identified as a crucial key factor, as women are less likely than men to use FinTech services due to trust concerns and perceived dangers (Burtch et al., 2018). Many factors have been identified to influence propensity to use FinTech services, including perceived utility, benefits, trust, and perceived risk. According to the TAM model, two variables impact user attitudes toward technology adoption: perceived utility (PU) and perceived

ease of use (PEOU) (Davis, 1989). The perceived usefulness variable relates to utility, how much a user of FinTech feels that the technology will increase their performance or productivity. Whereas PEOU refers to how much a user of bank account believes the technology is simple and easy to use. TAM has been used to examine customers' intentions of adopting FinTech services. Similarly, Huang and Chen (2019) found that the perceived utility variable influences the customers' intentions to use FinTech services.

2.1 Age

According to Chen at al. (2023) consumers of banks usually trust the use of technology in general, and financial technology in their routine particular varies by age group. Consumers' faith in technology may be lower among the elderly (Al-Shari et al., 2022). Furthermore, customers having different ages responded differently to the dangers of using FinTech (Tang et al., 2020; Meyliana et al., 2019). When compared to prior generations, younger generations, notably millennials and Generation Z, have exhibited higher rates of use of fintech services. This trend is likely to continue as younger people become more tech-savvy and comfortable with digital financial systems. (Zoi, 2021). Thus, this study hypothesized the following:

H1a: As people get older, they are less likely to trust using FinTech.

H1b: As people get older, their propensity to FinTech declines, and elderly people use technology less frequently.

H1c: The PEOU to FinTech reduces as people's ages rise.

H1d: The perceived usefulness (PU) of using FinTech reduces as people get older.

2.2 Gender

In low- and middle-income nations, where women own fewer mobile phones. Consequently, in comparison to men, women use less frequently mobile phones and internet (GSMA, 2019). Women are often more concerned about the implications of data sharing for their safety (Armantier et al., 2021), which may be a barrier to data sharing and widespread usage of financial technologies. The implementation of Technology is also determined by its ease of use (Thakor, 2020). The degree of ease differs between genders (Riquelme & Rios, 2010). Men are more ready to adopt new financial technologies if it is appealing to them and offer lower prices (Cockx & Brasseur, 2003). The following hypotheses are set to examine the effect of gender on the adoption of FinTech services.

H2a: Men are more trusted than women when it comes to using FinTech.

H2b: Men face greater risks while using FinTech than do women.

H2c: Men have higher PEOU to FinTech than women do.

H2d: Men have a greater PU to FinTech than women do.

2.3 Educational level

How customers use technology and how much they benefit from it depends on their education (Al-Shari et al., 2022). High education increases one's familiarity with contemporary technology (Alafeef et al., 2011). Customers with higher education levels are more inclined to view trusted FinTech services as trustworthy (Kaatz, 2020). People with a higher degree are more familiar with modern technology and feel less risk and more trust in modern technology (Im et al.,

2003). The following hypotheses are put out to examine the effect of education level on the attitude to use FinTech services.

H3a: The confidence in adopting FinTech increases with education level.

H3b: The risk of utilizing FinTech decreases with higher education.

H3c: The perceived ease of use (PEOU) to use FinTech increases with education level.

H3d: The use of FinTech increases with higher levels of education.

2.4 Income level

Smartphones and other modern technology-based products are within the reach of wealthy people and they gain more from technology. It is attributed to several good aspects, including improved access to digital capabilities, rising earnings, and a growing young population (Gulamhuseinwala, et al. 2015). Clients' opinions towards using FinTech services vary by income level. A handful of studies for example Aluri and Palakurthi (2011) and Chawla and Joshi (2021) reported a significant impact of income on the use of technology. Higher earners will therefore be more comfortable utilizing technology and accepting the hazards associated with it (Teo et al., 2012). In this research, the following hypotheses were put forth:

H4a: The willingness to use FinTech rises whenever income does as well.

H4b: Risks associated with using FinTech reduce as income rises.

H3c: As income rises, perceived ease of use (PEOU) for using FinTech also rises.

H4d: As money rises, more people are seen to find financial technology useful.

2.5 Demographic Influences on Attitudes to Using FinTech

Additionally, customers' attitudes toward embracing modern technology may be biased because they might need assistance using it. The Mobile Gender Gap Report 2020 by the GSMA found that women are lesser to possess to use technology devices like phones. As a result, women have twice as positive attitudes towards technology use than males (Teo et al., 2012). As people's levels of education increase, their attitudes about using technology will also become more informed since they will know more about how to manage modern technology (Teo et al., 2012). Based on the above argument following hypotheses are developed.

H5a-H5d. Demographic parameters, like age, gender, education level, and income level, have a significant effect on attitudes towards using FinTech.

2.6 Effect of TAM-Related Factors on the Customers' Attitudes

The Technology acceptance model makes clear the elements affecting customers of banks' attitudes toward acknowledging technology usage (Davis et al., 1989). The most significant criteria in this approach that are explained are usability and usefulness. In addition, numerous research highlights the significance of shaping consumers of banks' attitudes and intentions related to. PEOU is an important consideration when adopting FinTech services. Consumers need to see FinTech services as easy to use or else they will turn to traditional banking services. According to a survey, 75% of customers of banks think FinTech services are easy in utilize (Theiri & Alareeni, 2021). The following hypotheses are developed to test the impact of demographic characteristics on the attitude to use FinTech.

H6a: The level of client trust in attitudes is significantly correlated.

H6b: The level of Risks of use and attitudes are significantly correlated.

H6c: PEOU and attitudes are significantly correlated.

H6d: Perceived usefulness and attitudes are significantly correlated.

2.7 Effect of Customers 'Attitude toward FinTech on Their Intention to Adopt FinTech

It is well explained by the theory of reasoned actions and the technology acceptance model, intention to use modern technologies is significantly influenced by the attitude of users. Some recent studies (for example Alshari et al., 2022; Fernando et al., 2018) reported a significant and positive effect of attitude on the intention to use FinTech. Based on the above explanation, the following hypothesis is developed.

H7: Customers' attitude towards FinTech services has a significant impact on their intention to use FinTech services.

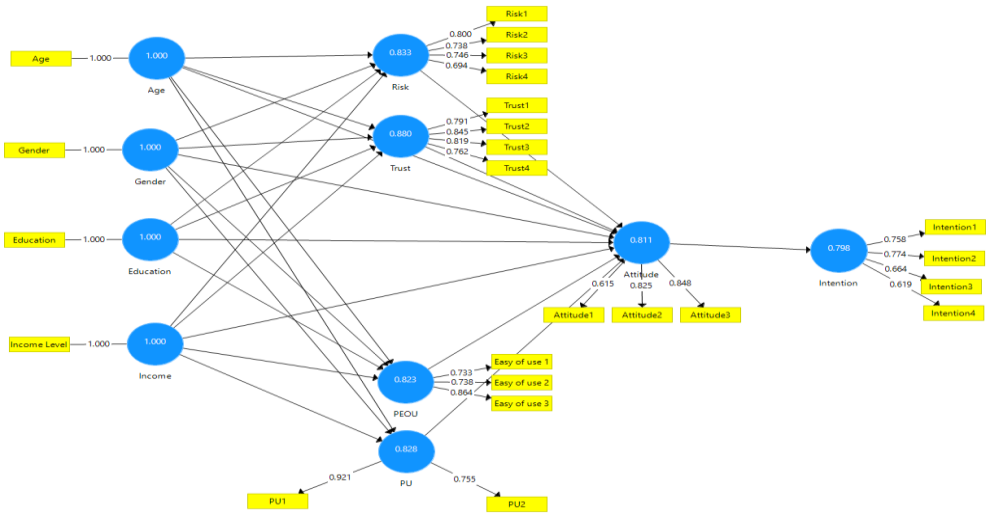

Fig. 1 Conceptual framework

3.0 Methodology

3.1 Sampling and Sample Size

For data collection online survey of customers through the Google form link was conducted between November 2022 and March 2023 using convenience and purposive sampling. This period has been longer because responders are not responding on time, hence numerous reminders were sent with a one-week break. These were just soft reminders that dependents on the respondents' willingness. Convenience sampling is one of the important and non-probability sampling method that is majorly use in which different participants are chosen based on their ease of access. This approach was used to ensure the maximum number of responses from the people living all over Pakistan. A Google link containing the structured questionnaire was shared among the customers of those commercial banks that provide banking, financing, and investment-related services in Pakistan via the internet, and mobile apps. For the online survey, customers were contacted by their phone numbers, emails, and other social media accounts (like Facebook, WhatsApp, etc.). The data about registered cell phone numbers and emails was obtained from the customer relation

offices after due approval from the head offices of banks. To cover ethical issues, customers were free to participate in the survey and respond or deny. Further, all responses were recorded anonymously. More than 300 questionnaires were distributed to contact lists, 600 on Facebook, and 100 to university students via email. All of these respondents had a bank account, and 150 questionnaires were obtained via a contact list, 350 from a Facebook friend list, and 50 from university students via email. Those emails were collected personally face-to-face. The total number of responses received was 550, with 453 finalized and the remainder rejected because they were not filled out correctly or were filled out by the respondent without clear reading. I detected these poor responses because they typically followed the same pattern of filling in, such as strongly agreed, disagreed, or simply agreed or disagreed with all questions. The sample is decided by the multiplication of variables and the number of questions asked in the survey. The total number of variables in the study was 6 and the questions were 24 out of which four were related to the human demographics.

3.2 Data Collection

For data collection, we adopted the questionnaire developed by Alshari et al. (2022). This questionnaire contains 24 questions to examine respondents' attitudes toward FinTech. There were two sections of the survey questionnaire. Demographic information about the participants, including gender, age, education, and income level, was covered in the first section of the survey. Participants were asked about their attitudes and future intentions toward using FinTech services in the second half of the survey, which included questions about perceived risk. Participants rated their level of agreement with each item on a scale from 1 (strongly disagree) to 5 (strongly agree). The questionnaire underwent pre-testing to ensure its validity and reliability before being used.

3.3 Data Analysis Procedures

The Smart PLS was employed to perform SEM analysis as suggested by (Anderson & Gerbing, 1988) for testing the proposed hypotheses statements. This paper used descriptive and inferential statistical analysis techniques to examine the survey questionnaire data. The demographic features of the people were summed up using descriptive statistics including mean, standard deviation, frequency, and percentage. Each component related to attitudes and intentions towards FinTech services was also computed. The relationship between demographic traits, attitude toward FinTech services, and intentions to use FinTech services was examined using multiple regression analysis. Mediation analysis was performed to examine the direct and indirect effects of PU, PEOU, Trust, Risk, and customers’ attitudes on their intentions to use FinTech services.

3.4 Ethical Consideration

The data was collected with the respondents' permission and used for research. There are no requests for their personal information, such as account numbers, photographs, or signatures, to ensure their privacy. The respondents' participation in this poll is entirely optional. First, ask for their permission to fill out the form, and then request that they fill out the response; otherwise, they may ignore it.

4.0 Findings and Results

The various methodologies and analytics approaches used to assess hypotheses, including variable regression analysis.

4.1 Descriptive Analysis and Normality Test

Table 1 shows that data were collected from 453 respondents, out of which 200 are females and 253 are males. According to the findings, 74 respondents are between the ages of 18 and 24. 118 respondents are in the 25-to-34-year age bracket. 140 responses are between the ages of 35 and 44, 86 are between the ages of 45 and 54, and 26 are between the ages of 55 and older. 11 and 5 respondents are under primary and secondary education respectively. 30 respondents fall under the "Diploma after High School" education category, 140 respondents fall under the "Bachelor" category, 219 respondents fall under the "Master" category, and 47 respondents fall under the "Ph.D." category. With six income range options, the highest number of respondents, 117 belong to the income range of Rs. 26000 to Rs. 70000.

Table 1. Demographic descriptive analysis

Factor	Number	Percentage
Gender		
Male	253	56.00%
Female	200	44.00%
Age		
18 to 24 years	74	16.40%
25 to 34 years	118	26.00%
35 to 44 years	140	31.00%
45 to 54 years	86	19.00%
55 to 64 years	35	8.00%
Education		
Primary school	6	1.00%
Secondary School	11	3.00%
Diploma after High School	30	7.00%
Bachelor	140	31.00%
Masters	219	48.00%
Ph.D.	47	10.00%
Income (per month)		
Rs. 25000 and below	42	9.00%
From Rs. 26000 to 70000	117	26.00%
From Rs, 71000 to 115,000	70	15.00%
From Rs.116000 to 160,000	84	19.00%
From Rs.161000 to 205,000	100	23%
From Rs. 206,000 and above	38	8.40%
Total	453	100%

The results of the normality test using SPSS version 22 are shown in Table 2. The results indicate that the skewness value should be within +1 and -1. The kurtosis value of the data predicts its peakness, which should be between +3 and -3.

Table 2 Normality analysis

Variables	Skewness	Kurtosis
Perceived Usefulness	-1.400	2.99
Perceived Ease of Use	-.749	1.018
Attitude	-.942	1.325
Intention	-.933	1.469
Risk	-.707	.141
Trust	-.719	.484

Table 3 Descriptive analysis

Variables	Min	Max	Mean	Std. Dev
Perceived Usefulness (PU)	1.50	5.00	4.431	0.579
Perceived Ease of Use (PEOU)	2.33	5.00	4.225	0.560
Attitude (Att)	1.67	5.00	4.200	0.616
Intention (Int)	1.50	5.00	4.186	0,582
Risk (	2.00	5.00	4.102	0.609
Trust	1.50	5.00	4.006	0.723

Descriptive analysis is reported in Tables 2 and 3. All variable values are within the permitted range of the skewness criteria. Because all of the variable values are inside the kurtosis range, the data is normally distributed, and the overall results are statistically significant. Together, mean and standard deviation provide insights into the data's central tendency and variability, assisting researchers in understanding and interpreting their results The mean value falls within the range, which is 4.4316 with a standard deviation value of 0.57967. The smallest value of perceived usefulness is 1.50, and the maximum value is 5. The minimum and maximum values for PEOU vary from 2.33 to 5, while the mean value falls within the ranges of 4.2252 and.56078. The attitude-sharing variable ranges from a minimum of 1.67 to a maximum of 5.00, with a mean value of 4.2001. and varies by a factor of.61501. The intention variable ranges in value from 1.50 to 5.00, with a mean of the value of 4.1860 and a standard deviation analysis of.58231. Risk and Trust values also have with range as shown in Table 3.

4.2 Reliability and Validity Analysis

According to the rule, Cronbach's alpha should be more than 0.7 in the reliability analysis. Cronbach's alpha analysis in current data is 0.90 indicates very high reliability of data, 0.70 and 0.90 indicate good reliability of data analysis, and 0.50 to 0.70 indicates acceptable reliability of data under analysis."

Table 4. Composite reliability of all variables

Cronbach's Alpha	N of Items
0.905	20

Information was gathered from 453 respondents. The All variable's Cronback's Alpha value is 0.904>.7, which is excellent and significant according to the guidelines of Chronbach's Alpha reliability analysis.

Table 5. Reliability of variables

Variable	Items	Cronbatch's Alpha
Perceived Usefulness (PU)	2	0.709
Perceived Ease of Use (PEOU)	3	0.791
Attitude	3	0749
Intention	4	0.774
Risk	4	0.817
Trust	4	0.734

Reliability in research refers to the consistency and dependability of data-gathering procedures and outcomes. Perceived Usefulness (PU) has an acknowledged reliability value of 0.711>0.7, which is higher than 0.7. PEOU reliability is 0.704>0.7, which is also respectable and trustworthy. The reliability value of attitude is approximately 0.703>0.7, which is considerable and satisfactory. According to reliability guidelines, the intention variable is likewise showing a 0.742>0.7, which is sufficient. Additionally, trust has an established reliability value of 0.756 which is higher than 0.7. The final variable, Risk, has a significant reliability value of approximately 0.814.

Table 6. Convergent validity

Variable	**Items**	**Factor Loading**	**CR>0.7**	**AVE>0.5**
Risk	Risk_1	0.733	0.819	0.643
	Risk_2	0.754		
	Risk_3	0.845		
	Risk_4	0.885		
Trust	Trust_1	0.823	0.743	0.683
	Trust_2	0.747		
	Trust_3	0.843		
	Trust_4	0.894		
PEOU	PEOU1	0.934	0.732	0.764
	PEOU2	0.924		
	PEOU3	0.749		
PU	PU_1	0.854	0.744	0.736
	PU_2	0.93		
Attitude	Attitude_1	0.853	0.705	0.738
	Attitude _2	0.895		
	Attitude _3	0.884		
Intentio N	Intention_1	0.822	0.739	0.738
	Intention _2	0.834		
	Intention _3	0.843		
	Intention _4	0.934		

Reliability relates to consistency, whereas validity refers to correctness, and both are required for credible study findings. Loadings on factors should exceed 0.6 for convergent validity. Items that did not meet the convergent validity requirement of 0.6 were excluded from

consideration. It measures validity using convergent and discriminant criteria. For each construct, the extracted average variance (AVE) was calculated. 0.50 is the appropriate value (Fornell & Larcker 1981). In discriminant analysis, the validity, of each concept's correlation of data value must be less and near to the square root of AVE. The variable's of data loadings on the different latent variables should be higher (Urbach & Ahlemann, 2010). By providing a precise discriminant validity test, the study compares AVE values to the square of correlation estimations for any two constructs.

4.3 Correlation Analysis

The results of correlation analysis are reported in Table 7. A common significance value for correlation analysis is 0.05, which represents a 5% chance that the observed association occurred by chance. This criterion allows researchers to assess if the association is statistically significant or not.

Table 7. Latent variable correlation

	1	2	3	4	5	6	7	8	9	10
1. Age	1.000									
2. Attitude	-0.057	1.000								
3. Education	0.084	0.192	1.000							
4. Gender	0.637	0.095	0.246	1.000						
5. Income	-0.010	0.229	0.357	0.125	1.000					
6. Intention	-0.048	0.205	0.254	0.042	0.775	1.000				
7. PEOU	-0.010	0.439	0.391	0.180	0.864	0.701	1.000			
8. PU	0.025	0.552	0.550	0.224	0.448	0.340	0.725	1.000		
9. Risk	-0.048	0.665	0.190	0.082	0.232	0.232	0.456	0.561	1.000	
10. Trust	-0.018	0.203	0.192	0.139	0.411	0.407	0.668	0.372	0.219	1.000

Results of the correlation analysis reported in Table 7 indicate a significant pairwise association between variables used in the study. The size of the coefficient shows the absence of sever collinearity problems.

4.4 Structural Equation Model Analysis

Table 8. Direct effects analysis

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	DECISIONS
Age -> PEOU	0.077	0.0313	2.4634	0.013**	Supported
Age -> PU	0.1348	0.0551	2.4445	0.014**	Supported
Age -> Risk	0.1301	0.0501	2.5964	0.009**	Supported
Age -> Trust	0.1192	0.0529	2.2539	0.024**	Supported
Attitude -> Intention	0.2053	0.0504	4.0726	0.000***	Supported
Education -> Attitude	-0.0063	0.0335	0.1882	0.85	Supported
Education -> PEOU	0.0776	0.024	3.2307	0.001**	Supported
Education -> Risk	0.1099	0.0414	2.6568	0.008**	Supported
Education -> Trust	0.0266	0.0346	0.7678	0.442	Not
Gender -> Attitude	0.0492	0.0326	1.5094	0.131	Not
Gender -> PEOU	0.1074	0.0288	3.7296	0.000***	Supported
Gender -> PU	0.2587	0.0501	5.1627	0.000***	Supported
Gender -> Risk	0.1158	0.05	2.3149	0.020*	Supported
Gender -> Trust	0.1611	0.0501	3.2131	0.001**	Supported
Income -> Attitude	-0.4901	0.1201	4.0814	0.000***	Supported
Income -> PEOU	0.8223	0.0227	36.2457	0.000***	Supported
Income -> PU	0.4146	0.0551	7.5204	0.000***	Supported
Income -> Risk	0.1769	0.0455	3.8911	0.000***	Supported
Income -> Trust	0.3808	0.0437	8.7122	0.000***	Supported
PEOU -> Attitude	0.8285	0.183	4.5271	0.000***	Supported
PU -> Attitude	0.0225	0.0744	0.3018	0.762	Not
Risk -> Attitude	0.4426	0.0426	10.3927	0.000***	Supported
Trust -> Attitude	0.2771	0.064	4.3319	0.000***	Supported
Age -> Attitude	0.0683	0.0297	2.3018	0.021*	Supported

4.4.1 Age

The results reported in Table 8 indicate that PU, PEOU, trust, and risk of using FinTech services is significantly determined by the age of customers. The positive relationship of age with PU, PEOU, trust, and risk (Technology acceptance factors suggests that as people get older, they perceive technology to be more user-friendly. People's opinions on any matter tend to get better as their age increases. This implies that people's perceptions and emotions are influenced by their age, with older people typically having a more positive view as they also have more experiences. That means people get more adept at using systems and technology as they become older, which may have an effect on their attitudes generally and their readiness to accept new technologies.

Table 9. Analysis of mediating effects

Hypothesis	Std. Beta (O)	Standard Error (STDE)	T Statistics (|O/STDEV|)	P Values	Decision
Age -> PEOU -> Attitude	-0.0638	0.0296	2.1529	0.035**	Supported
Education -> PEOU -> Attitude	0.0643	0.0239	2.6867	0.007***	Supported
Gender -> PEOU -> Attitude	0.089	0.0308	2.8928	0.003**	Supported
Income -> PEOU -> Attitude	0.6812	0.1522	4.4772	0.000***	Supported
Age -> PU -> Attitude	0.5003	0.0108	0.2805	0.049*	Supported
Gender -> PU -> Attitude	0.6058	0.0192	0.3029	0.026*	Supported
Income -> PU -> Attitude	0.5093	0.0303	0.3073	0.048*	Supported
Age -> Risk -> Attitude	-0.0576	0.0233	2.4759	0.013*	Supported
Education -> Risk -> Attitude	0.0487	0.0184	2.6472	0.008**	Supported
Gender -> Risk -> Attitude	0.0513	0.023	2.2332	0.025	Supported
Income -> Risk -> Attitude	0.0783	0.0206	3.8081	0.000***	Supported
Age -> Trust -> Attitude	0.033	0.0171	1.9267	0.054	Not
Education -> Trust -> Attitude	0.0574	0.0098	0.752	0.042*	Supported
Gender -> Trust -> Attitude	0.0447	0.0176	2.5428	0.011*	Supported
Income -> Trust -> Attitude	0.1055	0.0273	3.8666	0.000***	Supported
Age -> Attitude -> Intention	0.014	0.0068	2.0636	0.039*	Supported
Education -> Attitude -> Intention	0.0013	0.0072	0.1792	0.8578	Not
Gender -> Attitude -> Intention	0.0101	0.0071	1.4211	0.1556	Not
Income -> Attitude -> Intention	0.1006	0.0294	3.4203	0.000***	Supported
Age -> PEOU -> Attitude -> Intention	-0.0131	0.0078	1.671	0.095	Not
Education -> PEOU -> Attitude -> Intention	0.0132	0.0071	1.86	0.0432	Supported
Gender -> PEOU -> Attitude -> Intention	0.0183	0.0092	1.988	0.0471	Supported
PEOU -> Attitude -> Intention	0.1701	0.058	2.9328	0.003**	Supported
Income -> PEOU -> Attitude -> Intention	0.1399	0.0459	3.0454	0.002**	Supported
Age -> PU -> Attitude -> Intention	-0.0006	0.0024	0.2634	0.792	Not
Gender -> PU -> Attitude -> Intention	0.0012	0.0042	0.281	0.778	Not
PU -> Attitude -> Intention	0.0046	0.0158	0.2915	0.77	Not
Income -> PU -> Attitude -> Intention	0.0019	0.0068	0.283	0.777	Not
Age -> Risk -> Attitude -> Intention	0.0118	0.0058	2.0393	0.041	Supported
Education -> Risk -> Attitude -> Intention	0.01	0.0051	1.9562	0.0507	Not
Gender -> Risk -> Attitude -> Intention	0.0105	0.006	1.762	0.048	Supported
Risk -> Attitude -> Intention	0.0909	0.0227	4.0064	0.000***	Supported
Income -> Risk -> Attitude -> Intention	0.0161	0.0074	2.1615	0.030**	Supported
Age -> Trust -> Attitude -> Intention	0.0068	0.0042	1.6009	0.1097	Not
Education -> Trust -> Attitude -> Intention	0.0015	0.0023	0.6602	0.5093	Not
Gender -> Trust -> Attitude -> Intention	0.0092	0.0047	1.9436	0.0522	Not
Trust -> Attitude -> Intention	-0.0569	0.0196	2.9068	0.003**	Supported
Income -> Trust -> Attitude -> Intention	-0.0217	0.0085	2.5637	0.010**	Supported

Thus, people are more likely to recognize the usefulness and benefits of utilizing a specific technology or system as they get older. People get older and tend to view situations or technological dangers more unfavorably. This suggests that increased caution or risk aversion may influence negatively the decisions and behaviors of elderly people. On the other hand, results show that people tend to become more trusting of Fintech as they get older. This suggests that older people have more favorable attitude towards FinTech, that have a significant impact on their intention to use FinTech.

4.4.2 Education

The results support the hypothesis, indicating that higher levels of education are associated with more positive attitudes via perceived ease of usage. People with more education might be more able to understand and adjust to the system, which enhances their perception of its use and, thus, their attitude toward it. The results show that differences in customers' education levels significantly affect the PEOU, risk, and attitude.

4.4.3 Income

The results reported in Table 8 show that customers' income level significantly impacts the PU, PEOU, trust, risk, and attitude towards adopting FinTech. Further, mediating analysis results reported in Table 9 indicate that PEOU, PU, trust, and risk effectively mediate the effect of the income level of customers on their attitude toward FinTech.

4.4.4 Gender

Results reported in Table 8 show differences in the perceived usefulness, ease of use, trust, and risk of FinTech services by gender of customers. However, the gender of customers has no significant direct effect on their attitude to use FinTech services. Men typically view the system as being more beneficial compared to females, leading to a more positive attitude. Results of mediating analyses reported in Table 9 show that PU, PEOU, trust, and risk of using technology mediate the effect of customers' gender on their attitude towards FinTech services, However, the intention to use FinTech services is not determined by the gender of customers.

4.4.5 Effect of Customers' Adoption/ Acceptance Factors on the Attitude towards FinTech Services

The results reported in Table 8 establish that technology adoption/ acceptance factors (PU, PEOU, Trust, and Risk) have significant impact on the customers' attitude toward FinTech services. Further, results reported in Table 9 show that PU, PEOU, trust, and risk mediate the relationship between customers' demographics and their attitude towards FinTech services.

4.4.6 Customers 'Attitude and Their Intention to Use FinTech Services

Results reported in Table 8 show that customers' attitude towards FinTech services is significantly related to their intention to use FinTech services. Further, results reported in Table 9 indicate that customers' attitudes toward FinTech mediate the impact of customers' demographics on their intention to use FinTech services.

5.0 Discussion and Conclusion

This study aims to highlight the impact of customers' demographic attributes on their attitude and intention to use FinTech services in Pakistan. This study also emphasizes the mediating effect of TAM factors in establishing the linkage between customers' demographic attributes and their

attitudes toward FinTech services. This study highlights the importance of demographic characteristics' effects on customers' attitudes and intentions to use FinTech for banking services in Pakistan.

The analysis of the study shows a negative link between age and PEOU, indicating that older people find systems more difficult to use. Whereas, younger people possibly due to familiarity tend to see systems as more usable than older people. Earlier studies conducted by Venkatesh and Morris (2000) and Venkatesh et al. (2003), have shown that younger people possibly due to familiarity tend to see systems as more usable than older people. This implies that younger people are more likely to have a positive opinion about technology if they are more receptive to the risk involved. A greater level of trust in it substantially predicts a more positive attitude towards the Fintech. This implies that people are more inclined to see the technology favorably if they are confident or believe in it. Younger people may find the system easier to use, resulting in a more positive view towards it than older people. The results conclude that differences in age matter for adopting FinTech and these findings are consistent with the findings of earlier studies e.g., (Hu et al., 2019; Teo et al., 2012).

Higher education levels are linked to greater technology literacy and adaptability, which supports the favorable relationship between education and PEOU. People with higher levels of education are frequently more accustomed to utilizing complicated systems, which may account for their more positive perceptions of technology. Education plays a significant part in helping customers understand how to lower the risks associated with utilizing FinTech. These results are consistent with the findings of earlier studies (Braak & Davis, 2003). Further, the effect of education level of customers on their attitude toward adopting FinTech is significantly mediated by the PEOU, trust, and mitigating risk. It implies that the education level matters only if it helps in the PEOU, building trust, and mitigating risk. The results strengthened the findings of Aluri and (Palakurthi, 2011).

The findings of the study reveal that gender can influence perceptions of system usability, potentially due to differences in prior experience, cognitive styles, or socialization. Gender differences in PEOU, with females showing slightly higher levels, are consistent with findings of previous studies conducted by Venkatesh and Morris (2000) and Venkatesh et al. (2003). Despite the significant and positive effect of gender on attitude towards FinTech, the intention of customers to use FinTech is not determined by their gender. Similar findings were reported in a previous study conducted by Van Deursen and Van Dijk (2015). Overall analysis shows that in developing countries gender is a significant determinant of customers' intention to use FinTech services. It might be due to the dominance of males in society, most of the females lack financial independence, remain busy in household activities, and are not involved in the financial affairs of a family unit. Consequently, females are less likely to have the attitude and intention to use FinTech services. Similar findings were reported by earlier studies (for instance, Abayomi et al., 2019; Chawla & Joshi, 2018; Teo et al., 2012).

The findings of this study establish that differences in the income level of customers have a significant bearing on their attitude towards FinTech. Further, it is emphasized that people with greater incomes typically find the system easier to use, and perceive more utility as they are likely to make more use of FinTech for financial products and services. Teo et al. (2012) reported similar findings. According to this research, people with higher incomes typically have greater access to and familiarity with technology. Higher earners might also have more money to devote to picking up new skills, which could result in more favorable opinions about how simple new technologies are to use.

The findings of the study suggests that people's attitudes are shaped by their perception of the system's increased usefulness, perceived ease of use, trust, and risk as they get older, become more educated, and earn more income. More education is marginally associated with improved PEOU, which in turn produces more favorable attitudes and stronger intentions to act. This shows that through impressions of ease of use, education may indirectly influence attitudes and intentions. Positive attitudes contribute to stronger intentions to act, while higher income levels are related to better PEOU. This implies that attitudes and intentions are indirectly influenced by income through the perception of ease of use. These findings validate the findings of earlier studies, for instance, Aluri and Palakurthi (2011); Alshari et al. (2022); Hu et al. (2019).

Overall, it is concluded that demographic attributes of customers and technology acceptance model factors are the significant determinants of customers' attitudes towards FinTech services. Whereas, customers' intention to use FinTech depends on their attitudes toward FinTech which is significantly influenced by the technology acceptance factors (PU, PEOU, trust, and risk). The findings of the study establish a significant positive impact of customers' demographic attributes on their attitudes towards FinTech services. Moreover, TAM factors (perceived usefulness, perceived ease of use, trust, and risk of adopting FinTech services) are also found to have significant direct and mediating effects on attitudes and intention to adopt FinTech services.

5.1 Practical Implication and Recommendations

The findings of the study establish that intention to use FinTech services is significantly influenced by the attitude of customers toward FinTech. To increase the attitude of customers toward FinTech services, there is a need to develop a good perception of customers by enhancing the usefulness and easiness of using FinTech. Findings also suggest the improvement of security features of FinTech to mitigate the risk of using it. The management of financial institutions should consider the differences in demographic attributes of customers while introducing FinTech services. Moreover, efforts should be made to improve the perception of customers about the usefulness, ease of use, trust, and risk of using FinTech services. The regulators should improve the regulatory framework for mitigating risk exposure and for improving the trust of customers.

5.2 Limitations and Future Directions

The convenience sampling strategy employed by this study introduced bias into the sample.

Participants in the research were bank customers, who may not be representative of the overall community in Pakistan. Overall, these limitations should be considered when interpreting the study's findings. They may also open up avenues for future research to address these limitations and provide a more comprehensive understanding of the phenomenon. This study focuses on customers' attitudes toward the usage of FinTech in Pakistan, and may not be generalizable to other countries or regions with distinct socioeconomic conditions and cultural backgrounds. The study focuses on a small number of demographic parameters, such as age, gender, income, education, and gender but does not take into account other potentially important aspects, such as personality traits, social norms, and cultural values. The study excludes an examination of the regulatory and policy environments for FinTech services in LDCs, which can have a substantial influence on customers' attitudes and intentions toward such services.

Nisar Ahmad: Problem identification and motivation for the study, discussion of results and policy implication, etc., and review and improvement of the draft as a supervisor and corresponding author in response to comments of editor and reviewers.

Bilal Nafees: literature review and theoretical framework, idea refinement.

Ayesha Sabir: Writeup of methodology**,** data collection, analysis of data, and reporting of results.

Conflict of Interests/Disclosures

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