Factors Influencing FinTech Adoption Among Bank Customers in Palestine: An Extended Technology Acceptance Model Approach

Jamal Hurani * and Mohammed Kayed Abdel-Haq

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Article

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Jamal Hurani * and Mohammed Kayed Abdel-Haq

Centre for Islamic Finance, The University of Bolton
* Correspondence: jh13bbs@bolton.ac.uk

Abstract: This paper explores the factors influencing FinTech adoption among bank customers in Palestine using an extended Technology Acceptance Model (TAM). Through quantitative research, three factors—FinTech awareness, brand recognition, and trust—were assessed. A survey of 683 respondents analysed using PLS-SEM in SmartPLS software tested eight hypotheses linking awareness, trust, and brand with TAM's ease of use, usefulness, and FinTech adoption. All hypotheses were supported. Recommendations suggest banks and policymakers focus on FinTech awareness, education, and cybersecurity. Banks are encouraged to boost FinTech investments to retain and grow their customer base.

Keywords: fintech; technology acceptance model; Palestine; banking; financial inclusion; trust; awareness; brand

1. Introduction

FinTech has seen significant growth in recent years, drawing the interest of financial managers, consumers, and policymakers globally (Schueffel, 2016). Schueffel (2016) defined FinTech as "a new financial industry that applies technology to improve financial activities". Das (2019) explains that FinTech, short for financial technology, refers to innovations in finance powered by technology. Key players, including start-ups, large tech companies, and established financial institutions, are leveraging this technological advantage across the financial services value chain to deliver agile, efficient, and unique experiences to users. FinTech is considered both a disruption and an innovation in the financial sector (Anshari, Almunawar and Masri, 2020). Disruption occurs by providing the same services in more convenient or cost-effective ways, such as improved financial management tools and mobile payments. It also represents innovation by introducing new services like crowdfunding and peer-to-peer lending, attracting customers to obtain loans outside traditional banks or intermediaries. The importance of FinTech and the disruption caused to the financial services sector globally, highly influences the probability of disruption in the MENA region across certain products and customer segments (Zalan and Toufaily, 2017).

According to ABP (2023), the Palestinian banking sector has only emerged recently. It started in 1994 after the establishment of the Palestinian National Authority. The Palestinian Monetary Authority (PMA) is the regulatory equivalent to a central bank. There are thirteen banks operating in Palestine. Out of these thirteen, seven are Palestinian banks, five Jordanian and one Egyptian bank. It is important to note that the Jordanian and Egyptian banks are conventional, while three out of the seven Palestinian banks are Islamic. Financial inclusion in Palestine is low. As an indicator, by the end of 2020, there were only 44.3% of adults in Palestine who had a bank account, i.e., 55.7% were still without a bank account, thus financially excluded (PMA, 2021). This shows an emerging opportunity for FinTech to have a market entry point and provide financial services to this huge non-banking population. It is of importance for banks in Palestine to invest in FinTech, for the purpose of defending and increasing the market share. Moreover, banks' failure to develop and invest in FinTech

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may introduce existential risks in case their customers leave to other competitors. Additionally, FinTech can participate in economic development country wide.

The extended Technology Acceptance Model (TAM) will be used to explore the factors affecting bank customers FinTech adoption in the Palestinian banking sector, and to verify the TAM model's applicability in the Palestinian context. Quantitative research analysis will be adopted to analyse the survey results of bank customers.

2. Literature Review

Murinde, Rizopoulos and Zachariadis (2022, p. 1) concluded that the term FinTech is used to, "customarily describe breakthroughs in technology that potentially have the power to transform the provision of financial services, drive the creation of novel business models, applications, processes, and products, as well as lead to consumer gains' since the past two decades". The Financial Services Board (FSB) defined FinTech as, "technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets, financial institutions, and the provision of financial services" (CGFS&FSB, 2017, p. 2). This is the definition that is adopted in this paper.

Puschmann (2017) addressed drivers that led to the appearance of FinTech, they are:

-Changes in the role of IT where the convergence and development of IT such as the introduction of social computing, big data, machine learning, cloud computing and the internet of things, enables the creation of new services, processes, and business models for financial services.

-Changing consumer behaviour with more adoption of technology and the acceptance and demand for electronic interaction channels, the thing that directed the institutions to provide more electronic and hybrid self-services. Digital natives or millennials are more likely to adopt FinTech than other generations (EY, 2019). Behavioural intentions to use FinTech services were found to be determined by the perceived usefulness of FinTech, additionally, social influence has a significant negative influence on such intentions (Singh, Sahni and Kovid, 2020).

-Changing ecosystems, where incumbents like banks and insurance companies started to outsource part of their operations and cooperate with new start-ups and new entrants.

-Changing regulations, where many regulators lowered the entry barriers for FinTech and adopted what is called a *sandbox* to experiment with new services and business models. As Lee and Shin (2018, p. 37) state, governments since 2008 are providing a 'favourable regulatory environment' for FinTech, through the provision of licencing with minimal and easy capital requirements, in addition to some tax incentives to encourage and advance FinTech innovations. On the other hand, governmental regulators enforced stricter regulations, and higher capital and reporting requirements from financial incumbents (Lee and Shin, 2018). While this may be the case in some countries, it may not be the case in other countries, where they tend towards protectionism, such as in Taiwan (Iman, 2020).

FinTech has catalysed transformative shifts within financial ecosystems by fostering collaboration among diverse categories, including start-ups, traditional institutions, and government regulators (Albarrak and Alokley, 2021). This innovation ecosystem drives financial inclusion by improving access, encouraging competition, and fuelling continuous advancements. Understanding the ecosystem is important to identify the FinTech innovations and its interactions. Lee and Shin (2018) identified the five main elements of the FinTech ecosystem:

1.FinTech start-ups are entrepreneurial ventures offering innovative financial services across various sectors such as payments, wealth management, lending, crowdfunding, capital markets, and insurance. By 'unbundling' financial services, they can deliver personalized solutions to niche markets, disrupting traditional incumbents. This 'unbundling' allows consumers to seamlessly access financial services from multiple FinTech providers.

2.Technology providers and developers in emerging fields like big data analytics, cloud computing, social media, and cryptocurrency have created an environment conducive to entrepreneurial success. These technologies offer substantial cost efficiencies and require minimal capital expenditure, allowing entrepreneurs to quickly launch their innovations. The widespread use

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of smartphones, mobile network services, and social media platforms has enabled innovators to overcome physical barriers and reach a broader audience. This ecosystem benefits all participants, who share in the revenue generation.

3.Governmental institutions responsible for legislation and regulation have created a supportive environment for entrepreneurs through favourable licensing and capital requirements. At the same time, stricter regulations on traditional incumbents have allowed innovators to thrive and expand, for example, regulatory sandboxes, designed to foster innovation by enabling businesses to test their FinTech solutions in a controlled setting, exemplifying a move away from conventional regulatory methods. They represent an effort to adopt a more proactive, dynamic, and responsive approach to regulation (Fáykiss et al., 2018).

4.Consumers, both individual and organizations, play a crucial role. Millennials (aged 18 to 34) are the primary users of FinTech services in most countries, and demographic trends suggest a growing preference for FinTech in the future.

5.Traditional financial institutions, such as banks, insurance companies, stock brokerage firms, and venture capitalists, initially offered conventional financial services. However, recognizing the disruptions introduced by FinTech entrepreneurs, these incumbents were compelled to reassess their business models. In response, they began developing strategies to adapt to the FinTech era, increasingly embracing collaborative approaches.

The ecosystem is of high importance for the development of FinTech. This is relevant in the Palestinian market as well (Al-Daya, Nassar and Al-Massri, 2022). Daqar (2021), argues that Generation Z and millennials do have a high appetite to use and adopt FinTech in Palestine, moreover regulatory firms are taking positive approaches towards lowering entry requirements for entrepreneurs.

As technology is the main part of FinTech, the mostly widely used theory for consumer adoption of FinTech is the Technology Acceptance Model (TAM) (Davis, 1989). TAM originated from both the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1977), and the Theory of Planned Behaviour (TPB) (Ajzen, 1991), both from psychology. TAM has become popular in anticipating the acceptance of technology and is considered the key model for this purpose (Marangunić and Granić, 2015). Li (2020) says that behavioural theories are suitable to explain and anticipate individuals' adoption of FinTech. Oliveira and Martins (2011) concluded that theories that are concerned with individuals' adoption of technology, and most widely used, are the Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), and Unified Theory of Acceptance and Use of Technology (UTAUT). Ashique Ali and Subramanian (2024) concluded that TAM is the most extensively utilised framework in research concerning the adoption of mobile banking, while Jafri et al. (2024) mentioned that TAM is the most used framework by studies of FinTech in banking.

The TAM model classifies factors affecting the attitude of individuals towards acceptance or rejection of technology into perceived usefulness (PU), and perceived ease of use (PEOU) as seen in Figure 1 below (Davis and Venkatesh, 2004). Perceived usefulness is defined as, "the degree to which a consumer using this new technology would improve the work efficiency of that consumer", while perceived ease of use is defined as "degree of effort involved in using this new technology" (Hu et al., 2019, pp.3-4).

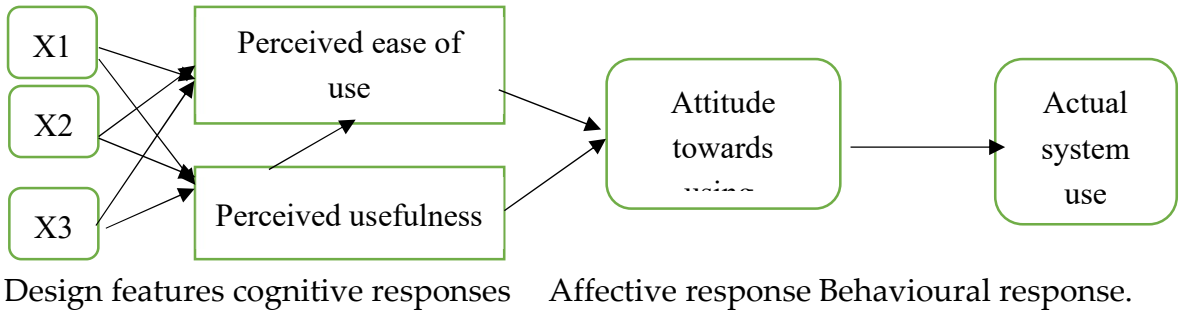

Figure 1. TAM model, source (Davis and Venkatesh, 2004.).

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3. Hypothesis Development

Numerous studies have employed and recommended an extended TAM model to predict the adoption of technology and FinTech, based on perceived ease of use and perceived usefulness, along with other factors such as knowledge (Majumdar and Pujari, 2022), and security and trust (Sulaiman and Almunawar, 2022). Additionally, other factors included service trust and social influence (Akinwale and Kyari, 2022), customer awareness and perceived trust and risk (Tiwari, Tiwari and Gupta, 2021), perceived risk and perceived trust (Tiwari and Tiwari, 2020), data security, customer trust and user design (Stewart and Jürjens, 2018).

Bank branches distribution and geographical coverage, and the availability of internet access through mobile data and broadband coverage, are of importance to customers' adoption of FinTech. Studies have shown that FinTech adoption tends to increase in areas underserved by traditional banks, especially in rural and low-income areas (Berg et al., 2020). In some cases, banks use their physical presence to offer FinTech services, thus blending the strengths of digital and physical channels (Claessens et al., 2018). A financial inclusion diagnostic report from 2023 in Palestine, shows that there are sufficient branches and ATM distribution in Palestine (Abdel Jawwad, Hinn and Morrar, 2023), hence this factor was not chosen to be explored in this study.

Furthermore, the PCBS (2023) report shows that in the year 2022, about 92% of households in Palestine had access to internet service. Meanwhile 89% of population (10 years and above) used the internet from anywhere. It is worth highlighting the fact that Palestinian mobile operators use limited 3G frequencies in the West Bank, while still using 2G in Gaza because of Israeli occupation control and limitations over frequencies and allowed telecommunications equipment. Researchers chose not to explore this factor in this study leaving it for future studies to consider the limited influence of Palestinian mobile operators.

The extended TAM framework was used in this paper with three factors: FinTech awareness, customers' trust in FinTech, and brand strength, as shown in Figure 2.

Customer awareness of FinTech was identified as relevant to its adoption by Tiwari, Tiwari and Gupta (2021), furthermore Majumdar and Pujari (2022) concluded that available knowledge about technology influences its usage and adoption. Therefore, awareness was examined from two perspectives: First, the perception of respondents regarding the availability of sufficient information about FinTech in the Palestinian market. Second, the efforts of customers to stay informed and updated about FinTech, which usually is the result of stakeholders FinTech information campaigns and prompting efforts. The hypotheses concerning awareness and its relationship to perceived ease of use and perceived usefulness are:

H1: There will be a significant relationship between FinTech customer awareness and ease-of-use (AW→ES).

H2: There will be a significant relationship between FinTech customer awareness and usefulness (AW→ US).

Brand strength signifies the worth a brand holds in consumers' perceptions, shaped by elements like brand recognition, loyalty, perceived quality, associations, and emotional connection. It indicates how effectively a brand is positioned in the market and its capacity to draw in and keep customers, impact purchasing decisions, and endure competitive challenges (Kotler and Keller, 2006). This paper is related to the perceptions of customers about their bank's FinTech solutions. Brand was found to be important in studies about the extended TAM model, for example, Chinese consumer intention to use mobile commerce (Chi, 2018). Furthermore Davis and Venkatesh (2004) suggest that external factors, including brand image, can significantly influence both perceived ease of use and perceived usefulness. This is because brand image often encapsulates notions of quality, reliability, and user-friendliness. Respondents were questioned about their opinions about subjects including the preferences of users to use only FinTech provided by their banks, additionally their trust in their bank's continuous investments in the enhancing and introduction of FinTech. Moreover, the preference of customers to use their bank's FinTech against those provided by non-banks. The hypotheses about brand and its relation to perceived ease of use, and perceived usefulness are:

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H3: There will be a significant relationship between brand and ease-of-use (BR→ES).

H4: There will be a significant relationship between brand and usefulness (BR→ US).

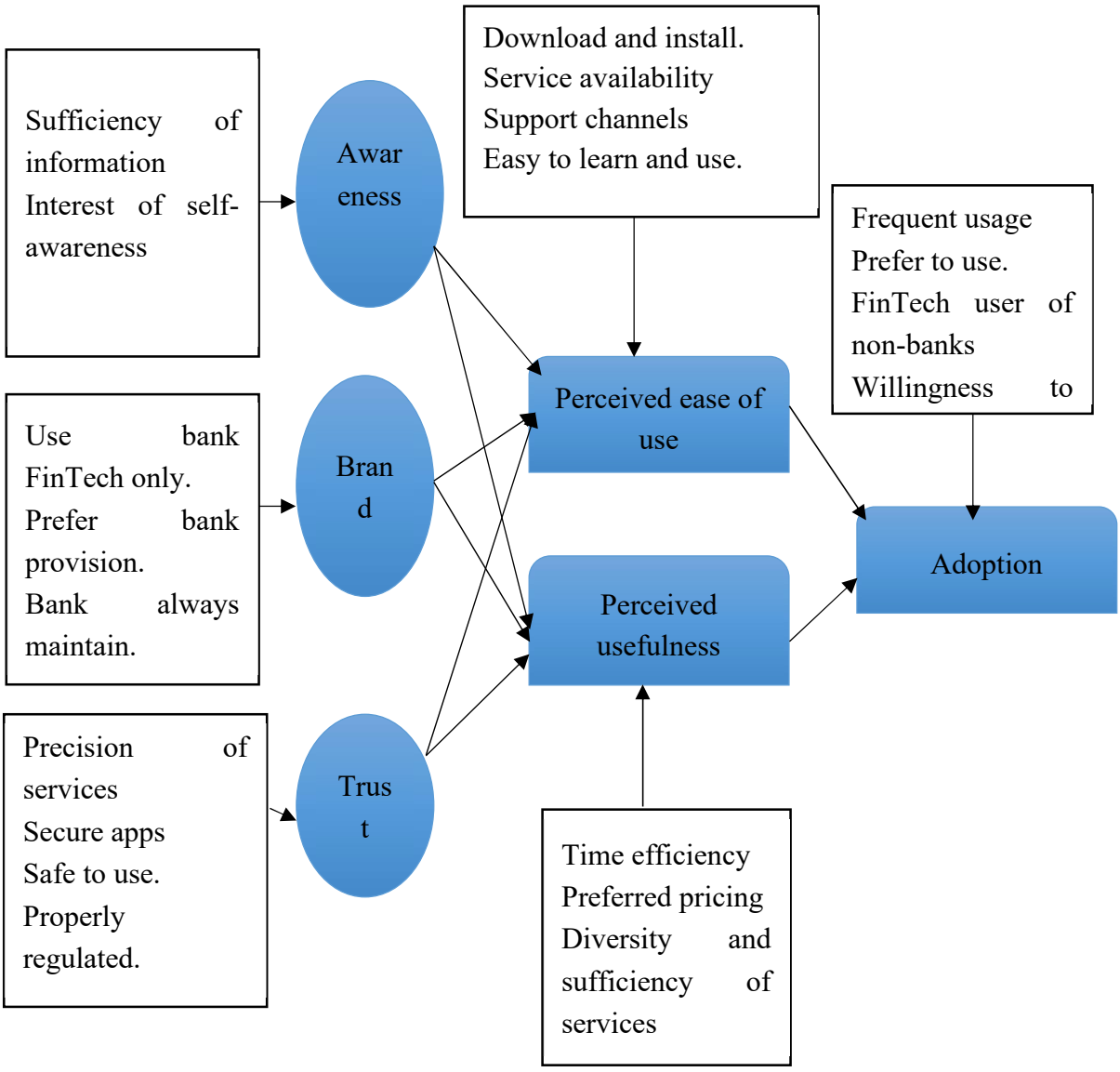

Figure 2. Extended TAM model.

Trust includes the trust of FinTech services precision and the right execution of their requests. Moreover, a moderating variable about confidence about security of FinTech services contributes to the trust factor. Trust is also related to the relationship between customers and their banks. Trust was identified as an important factor affecting perceived ease of use and perceived usefulness, and perceived trust and risk (Tiwari, Tiwari and Gupta, 2021), perceived risk and perceived trust (Tiwari and Tiwari, 2020), and data security, customer trust and user design (Stewart and Jürjens, 2018). This factor was handled through the trust felt by customers to use other FinTech providers than their bank. The trust factor comes also from the regulatory aspect, where confidence of those FinTech providers can be enhanced if they are regulated by the PMA. The hypotheses about trust and its relation to perceived ease of use, and perceived usefulness are:

H5: There will be a significant relationship between trust and ease-of-use (TR→ES).

H6: There will be a significant relationship between trust and usefulness (TR→ US).

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The **perceived ease of use** of FinTech services provided by banks and FinTech companies were measured by asking about the following factors:

1.The ease of downloading and installing of FinTech applications, including the availability of these applications and their compatibility for different mobile operating systems including IOS and Android. This gives users the opportunity to use FinTech services without location limitations except for the availability of internet connection and suitable technology devices.

2.The high availability of FinTech services with minimal downtime gives the customers the impression about ease of use anytime with confidence and trust and provides users with time flexibility.

3.The provision of FinTech services requires the high availability of support provided by banks or companies to help users overcome any obstacles or solve any problems concerning the applications and their services. Such support channels can be diverse including call centres around the clock, chatbots and other channels.

4.The ease of the applications themselves and the ability to learn and use them is another factor that is related to the ease-of-use factor.

A hypothesis developed concerning relationship between perceived ease of use and FinTech adoption is:

H7: There will be a significant relationship between ease-of-use and FinTech adoption (ES→FA).

Perceived usefulness is related to how the users perceive the privileges and benefits of using the FinTech solutions, including:

1.Saving of users' time through usage of FinTech services, such saving happens as a result of reducing the time needed to reach geographic locations like branches and offices, and the time required inside such branches to receive the applications, or the time needed to process such applications, like executing a transfer.

2.Reduced fees and charges for banking and financial services executed using FinTech, represent an aspect of financial benefits or usefulness. Another aspect is the better pricing for fixed deposits or saving accounts. Furthermore, preferred pricing for FinTech services is a promotional tool employed by banks to promote customer FinTech adoption.

3.The diversity of FinTech services and its sufficiency is an important variable that affects users. Provision of complete alternative service channel to branches, and even provision of some FinTech only services contribute to the usefulness of such services to users.

A hypothesis about the relationship between usefulness and FinTech adoption is:

H8: There will be a significant relationship between usefulness and FinTech adoption (US→ FA).

In conclusion, the following hypotheses were identified based on the above conceptual model:

H1: There will be a significant relationship between Fintech awareness and ease-of-use (AW→ES).

H2: There will be a significant relationship between Fintech awareness and usefulness (AW→ US).

H3: There will be a significant relationship between brand and ease-of-use (BR→ES).

H4: There will be a significant relationship between brand and usefulness (BR→ US).

H5: There will be a significant relationship between trust and ease-of-use (TR→ES).

H6: There will be a significant relationship between trust and usefulness (TR→ US).

H7: There will be a significant relationship between ease-of-use and Fintech adoption (ES→FA).

H8: There will be a significant relationship between usefulness and Fintech adoption (US→ FA).

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4. Methodology

4.1. Instrument Development

The survey used in the present study (shown in appendix A) consisted of two sections: the first section was designed to gather sample profile demographics using six items including gender, age group, education level, employment status, income level, in addition to the main banking relationship.

The second section reflected the extended TAM model and included the FinTech related questions. They were designed to poll respondents' perspectives about different factors that may affect the adoption of FinTech. Twenty questions were used to represent the six factors. The factors were Ease of Use (ES), with four questions about Usefulness (US), three questions about Trust (TR), four questions about Brand (BR), three questions about FinTech Awareness (AW), and two questions about FinTech Adoption (FA).

Respondents were asked to rank their agreement with the statement using a five-point Likert scale, where: strongly disagree (1), don't agree (2), neutral (3), agree (4) and strongly agree (5).

Table 1 below shows the operationalization of the model constructs, the survey used twenty questions to poll the sample's opinion about the six constructs based on the mentioned conceptual framework adopted.

Table 1. construct operationalization.

Construct (Variable)	Indicators	Related Question in the questionnaire	References
Perceived ease of use (ES)	ES1	Downloading and installing my bank's FinTech applications are easy.	(Xie et al., 2021), (Hu et al., 2019).
	ES2	FinTech services are available at all times with minimal downtime.	(Sakala and Phiri, 2019).
	ES3	My bank provides support channels (like call centres, chatbots, etc.) to help solve any problems with FinTech services.	(Singh, Sahni and Kovid, 2020), (Le, 2021).
	ES4	FinTech services provided by my bank are easy to learn and use.	(Singh, Sahni and Kovid, 2020), (Sakala and Phiri, 2019).
Perceived usefulness (US)	US1	Using the bank's FinTech, like digital services instead of branches, is more time efficient and it saves my time.	(Singh, Sahni and Kovid, 2020).
	US2	My bank provides preferred pricing and reduced charges for FinTech services.	(Mangin et al., 2011), (Solarz and Swacha-Lech, 2021).
	US3	FinTech services are diverse, they serve my needs, and are better alternatives to visiting branches.	(Mangin et al., 2011), (Solarz and Swacha-Lech, 2021).

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FinTech Adoption (FA)	FA1	I frequently use FinTech services provided by my bank (like mobile application and/or internet banking, e-wallets, etc).	(Hu et al., 2019).
	FA2	I am a user of FinTech services provided by non-banks providers (like e-wallets that are not provided by banks).	
	FA3	I prefer to bank using FinTech rather than using branches.	(Hu et al., 2019).
	FA4	It is fine with me to use FinTech services provided by companies other than my bank.	
Brand (BR)	BR1	I prefer to use FinTech services only if provided by my bank.	(Le, 2021), (Hu et al., 2019).
	BR Square	My bank keeps updating its FinTech services and introducing new ones.	(Solarz and Swacha-Lech, 2021).
	BR3	I prefer to have my bank offer FinTech services, rather than those offered by non-bank providers.	(Hu et al., 2019).
Trust (TR)	TR1	I am comfortable about the precision of my banks' FinTech services.	(Hu et al., 2019).
	TR2	I think that FinTech services provided by my bank are not secure enough.	(Singh, Sahni and Kovid, 2020), (Solarz and Swacha-Lech, 2021).
	TR3	I don't feel safe using FinTech provided by companies other than my bank.	(Singh, Sahni and Kovid, 2020).
	TR4	I am ready to convert to non-bank FinTech companies only if they are regulated by the Palestinian Monetary Authority (PMA).	
Awareness (AW)	AW1	There is sufficient information available about FinTech in Palestine.	
	AW2	I keep my self-updated about FinTech services and its providers in Palestine.	

4.2. Data Collection

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A questionnaire was organized using Google Documents and was electronically distributed using two methods. First, it was sent to banks' CEOs and general managers to distribute it to their customers and encourage them to participate through their branches across Palestine. Second the questionnaire was shared by a Palestinian social networks' influencer who shared it on her Facebook page, moreover one author shared it also on his Facebook page and sent it to WhatsApp groups. To avoid sample bias, a meeting was held with bank CEOs to refine the research methodology. The agreed approach was to have branch managers randomly distribute the questionnaire to customers, offering options for participation; electronically, manually, or with staff assistance. Manually completed questionnaires (35 in total) were collected via email. To improve response rates, a Facebook influencer with over 250,000 followers, representing a broad demographic, was hired to share the questionnaire. This ensured a diverse and more representative sample across various groups.

The targeted sample size was 2000 and responses reached 683 after two weeks with a response rate of 34%. This number of responses bypassed the minimum required number of 384 responses, to reach 95% confidence level and 5% margin of error. The questionnaire was then signed as completed at a Google Documents site.

4.3. Data Analysis Tool

The responses were numerically coded to facilitate quantitative analysis, with 'strongly agree' assigned a value of 5 and 'strongly disagree' assigned a value of 1. Negative statements were reverse scored to maintain consistency across measures. As responses were collected using Google Forms, incomplete forms were not accepted, and that meant that the 683 responses were all accepted. The questions were coded to represent their correlating factors as shown in Table 1 above. The resulting Excel sheet was uploaded and analysed using PLS-SEM 4.0 software.

4.4. Analysis Methods

The questionnaire was coded, answers were translated numerically using a scale from 1 to 5; strongly agree was given 5, agree was given 4, neutral is 3, disagree is 2 and strongly disagree is 1.

Descriptive statistics were used to analyse the collected responses. The technique of Structural Equation Modelling (SEM) is extensively employed for analysing complex relationships between observed and latent variables. Complex theoretical models are typically investigated using this method in the social sciences, marketing research, and other disciplines. Covariance-based SEM (CB-SEM) is a well-known SEM method that has historically been used to estimate and analyse complex relationships between variables. It presupposes that the observed variables have a multivariate normal distribution, which can be described by covariance matrices. Partial least squares of Structural Equation Modelling (PLS-SEM) is a highly effective instrument for multivariate analysis (Hair, Joseph et al., 2021). According to Chin and Newsted (1999), PLS is a preferred variance-based structural equation modelling technique to handle a small size sample. Although the use of PLS has some criticism, its use has increased in the past ten years in social and management research (Chin and Newsted, 1999). Rigdon, Sarstedt and Ringle (2017, p. 6) summarised criticisms proposed by scientists to the PLS-SEM as 'not a (factor-based) latent variable method, producing biased and inconsistent parameter estimates', on the contrary Hair, Joe et al. (2017) argued that PLS-SEM has matured in model complexity and formative measures.

Choosing between CB-SEM and PLS-SEM should not deter researcher attention from all other aspects of the phenomena under observation, and hence focus should be given to collect reliable data (Sarsour and Dombrecht, 2016). Considering adequate sample size, both methods would be suitable for the analysis of responses. The choice was made to use the PLS-SEM.

Using SmartPLS 4 software, this paper uses Partial least squares structural equation modelling PLS-SEM to analyse the inferential statistics to predict the model.

5. Data Collection and Analysis

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5.1. Descriptive Analysis

The questionnaire had two parts; the first part included sample profile; it included social questions about gender, age, work status, monthly income, and main banking relationships being conventional, Islamic or both. While the second part reflected the extended TAM model and included the FinTech adoption related questions. They were designed to poll respondents' perspectives about factors which affect adoption of FinTech: Ease of Use (ES), Usefulness (US), Trust (TR), Brand (BR), Social Effect (SE) and FinTech Awareness (AW).

5.1.1. Gender

Responses show that there were 552 responses as male, 127 as females, and 4 chose not to answer, as seen in Table 2. The numbers to some degree reflect the females' lower financial inclusion percentage (Financial Inclusion Palestine, 2023). Plans and efforts should be put in place to raise females' financial inclusion and encourage them to start banking relationships.

Table 2. Gender.

Gender	Male	Female	Prefer not to answer	Total
Number of responses	552	127	4	683
Percentage	80.8%	18.6%	0.6%	100%

5.1.2. Age in Years

Table 3 shows the age distribution of respondents. Around 47% of respondents fall between 36-50 (318 out of 683 respondents), while 8.3% of respondents were below 25 years old. The low percentage of the age groups below 25 years may be linked to the low financial inclusion percentage (Financial Inclusion Palestine, 2023).. More efforts are needed to enhance financial inclusion for younger people by the provision of FinTech solutions. Furthermore, strategic plans and actions are required to help the Palestinian economy develop and create jobs to benefit from young people's ability to contribute to production.

Table 3. Age in years.

Age in Years	Below 18	18-25	26-35	36-50	50-65	Over 65	Total
Number of responses	15	42	140	318	167	15	683
Percentage	2.2%	6.1%	20.5%	46.6%	24.5%	2.2%	100%

5.1.3. Work Status.

Table 4 shows the results distribution of work status. Only 2.9% are not working (unemployed) and 3.8% are retired. As discussed in the age subsection, it can be inferred that those who have banking relationships are those who are employed within Palestine.

Table 4. Work status.

Work status	Not working	Employee /Supervisor	Manager	Senior and Top Management	Self-employed/business owner	Retired	Total
Number of responses	20	258	147	139	93	26	683
Percentage	2.9%	37.8%	21.5%	20.4%	13.6%	3.8%	100%

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5.1.4. Monthly Income

Table 5 shows five categories of income. Most respondents or 39% of them (267 out of 683 respondents) have an income level between 1500 and 3500 dollars. More than 68% of respondents earn 3500 dollars a month or less, this is in line with the average monthly wages in Palestine (PCBS, 2022).

Table 5. Monthly income.

Monthly income in USD	Below 1500$	Between 1500$ and 3500$	Between 3500$ and 5000$	Between 5000$ and 7000$	Above 7000$	Total
Number of responses	192	267	103	50	71	683
Percentage	28.1%	39.1%	15.1%	7.3%	10.4%	100%

5.1.5. Main Banking Relationship

Table 6 below shows four types of bank relationships: conventional, Islamic, both bank types, and those without a banking relationship. Results show that 402 of the respondents are dealing with conventional banks, 128 bank with only Islamic banks, and 111 are dealing with both conventional and Islamic banks. The numbers are consistent with Islamic banks market share in Palestine of around 20% (ABP, 2020).

Table 6. Banking Relationship.

Banking relationship	Conventional bank	Islamic bank	Both conventional and Islamic	No banking relationship	Total
Number of responses	402	167	111	3	683
Percentage	58.9%	24.5%	16.3%	0.3%	100%

5.1.6. FinTech Adoption

Figure 3 presents customers' responses to questions about the adoption of FinTech. It shows that 93.7% of respondents agree or strongly agree, describing themselves as FinTech users of FinTech services provided by their banks. Moreover, more than 90% of respondents prefer to execute their banking services through FinTech alternatives rather than branches and offices. This indicates both: the high adoption rate, and the high intention rate of customers to use FinTech services when provided by their banks. The results indicate that FinTech services provided by banks are widely adopted by their customers. This may imply the success of banks' strategies to convince their customers to use FinTech services. Sustainable efforts and resources are required by banks to build on the results, through continuously upgrading their FinTech services, and ensuring that they are up to date and fulfil customers' needs. Moreover, banks need to extend their efforts to raise awareness of their customers about their FinTech services. Consequently, it may be suitable for them to consider limiting their investments in branches and offices and directing more investments towards FinTech services.

In relation to FinTech services offered by non-banks, 48.5% of respondents agree and strongly agree that they use them frequently. This indicates that non-bank FinTech providers are gaining market share and customers' confidence. When asked about willingness to use non-bank provided FinTech services, 53.73% of respondents showed willingness to use them, while 23% were neutral. Results indicate that there is an opportunity for FinTech entrepreneurs to strengthen their market share considering that only around 23% disagree and strongly disagree with using the non-bank

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offered FinTech services. FinTech entrepreneurs and providers can benefit from these results by analysing and enhancing their strength factors and handling users' concerns about their services.

The results also confirm the level of customers' recognition of the benefits of FinTech services. An additional outcome here for banks, is the risk of losing market share resulting from their customers moving to non-bank FinTech service providers, this may happen if banks fail to meet their customers' FinTech expectations or allow others to better innovate and present FinTech solutions. Banks need to assess their position and set suitable strategies for dealing with non-bank competition and conclude a working framework.

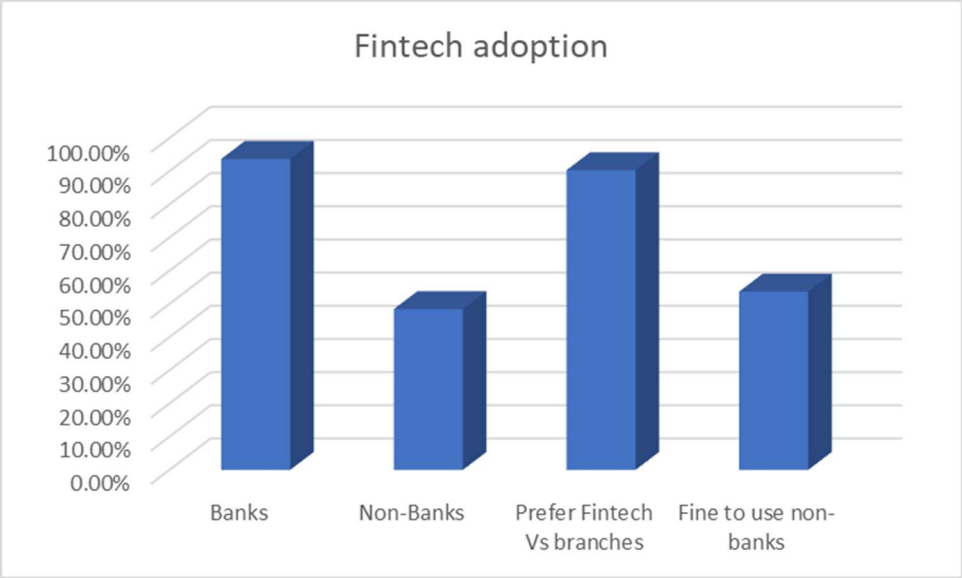

Figure 3. FinTech Adoption.

5.1.6.1. Perceived Ease of Use

As discussed previously, perceived ease of use refers to the "level at which an innovation is perceived by an individual easy to understand, learn and use" (Dhingra and Mudgal, 2019, p. 294). To identify the ease-of-use factor, as seen in Figure 4, four aspects were used: Downloading and installing, service availability, the provision of support, and ease of learning and usage. Around 90% of respondents responded as strongly agree or agree, to the question about ease of downloading and installing the FinTech applications of their banks. This portrayed that banks are successful in addressing this factor at present, and need to maintain this in the future.

Around 90% said that the FinTech services provided by their banks are easy to learn and use, which implies that banks are conveniently providing FinTech services. Availability of FinTech services with minimal downtimes is another factor that can affect sustainability of service provision, contributing to the FinTech services ease-of-use. Around 91% of respondents confirmed that their banks are maintaining the availability of their FinTech services with high availability and minimal downtimes. This consistency in service reliability positively impacts customer adoption by building trust and reinforcing the utility of FinTech solutions. Banks and other FinTech services providers should always adopt planned downtimes announced beforehand, with minimal downtime periods, and being conducted when usage is at its minimum.

Finally, banks' support for their FinTech services is a critical factor for the ease-of-use construct. Support channels should be available and sufficient to respond to inquiries and provide immediate help and support to those FinTech services' users who need them. Around 82% responded that their banks provide support channels such as information centres, chatbots and other channels for this subject. It is worth mentioning that such provision should have all the tools to provide help to customers, as provision of those channels is one aspect, and their ability to help is another aspect. Banks need to empower those channels to help and support providers rather than to be people who record complaints.

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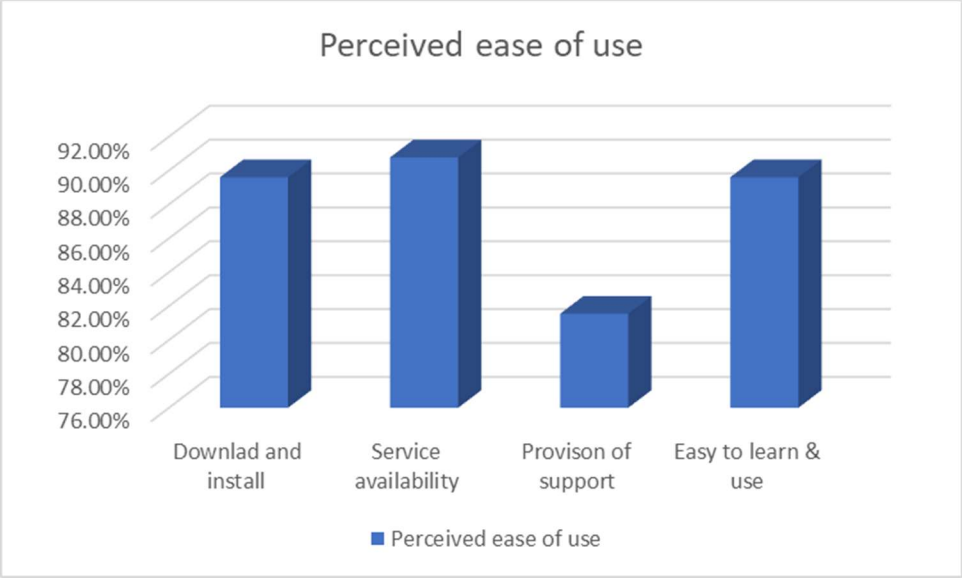

Figure 4. Perceived ease of use.

5.1.6.2. Perceived Usefulness

Perceived Usefulness is the second factor of the TAM model that affects consumer adoption and use of technologies. Usefulness is perceived when people believe that their use of technology will upgrade their performance (Dhingra and Mudgal, 2019). Figure 5 summarizes responses to the perceived usefulness factor. Time is a critical factor in service delivery. Time has more than one aspect; it can be the service availability time, and it can also be the time needed to complete the service. Time efficiency is always of great importance to customers. Around 91% of respondents said that using FinTech services is timely and efficient which is better than when using conventional service channels like branches and offices. Only around 3% disagreed. Banks should always care about time efficiency in their FinTech services and should introduce either the same services or alternative ones to those provided by locations like branches.

Customers' earnings and expenditure are another subject that is related to usefulness (Mangin et al., 2011), where customers enjoy better pricing on the FinTech services compared to the same services at branches, aside from the time factor. Examples about this factor include higher interest rates or revenues for fixed deposits or e-saving accounts, less commissions on e-opened accounts or requested services like cheque books and transfers, and better money exchange rates for currency exchange deals executed using the digital platforms. Around 72% of respondents said that their banks offer better pricing for FinTech services, while around 11% disagreed and 16% were neutral. Results indicate that while most customers perceive better pricing, some do not. This may be true where banks are not offering enhanced pricing or may highlight customers' lack of awareness about better FinTech pricing. In both cases, banks need to give special attention to this matter and design their FinTech offering to include and promote pricing advantages. Banks have cost efficiencies and savings resulting from customers executing their transactions digitally, compared to staff dependent services branches, and other saved costs. Additionally, banks need to make their customers aware of such enhanced pricing through their marketing initiatives and proper communication strategies.

The diversity of FinTech services occurs because of the provision of comprehensive services that create a real alternative to branches on one side, innovations and new services on the other side, and the widespread integration with the ecosystem through APIs, open banking, and banking as a service (Baas). Around 86% of respondents said that FinTech services are diverse, fulfil customers' needs and are preferable to them rather than visiting branches and offices. Banks are required to continue the provision of FinTech services and introduce new ones continuously. At the same time banks need to deepen relationships with other institutes within the ecosystem to enable new payments and FinTech services and widen the ecosystem.

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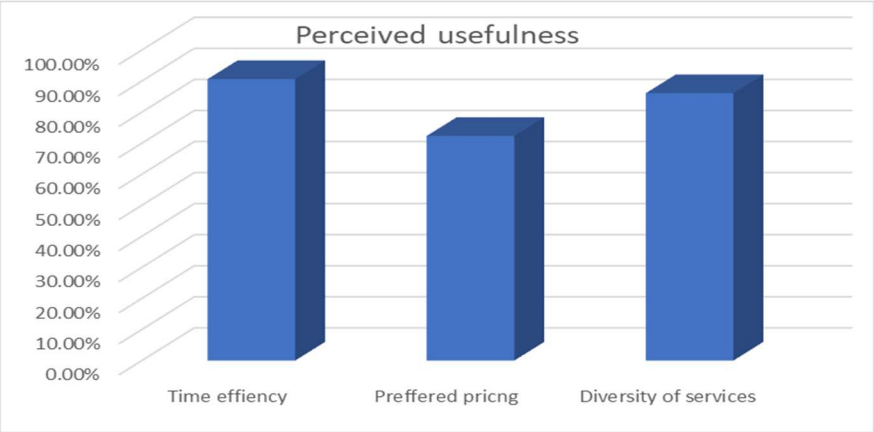

Figure 5. Perceived Usefulness.

5.1.6.3. Strength of Brand

Brand strength can be inferred through the trust customers perceive in the bank's products and services and their loyalty to them. Strong brands enjoy customers' loyalty by appreciating their products and services and their belief in their quality. People in most cases are willing to pay higher prices for branded services and products (Le, 2021). Brand factor main responses are shown in Figure 6.

Around 60% of respondents affirmed their preference to use FinTech services only from their bank. That means that around 40% are ready to use FinTech services of other banks or non-bank providers. While results imply moderate strength of banks' brands, the results of another question about customer preferences to FinTech provision by their current bank, show that around 94% prefer this. Consequently, while customers value their banks' brands, they also value technology, and want their banks to invest in FinTech, hence they prefer to use them. But customers are not limiting themselves to what their banks offer, many are willing to move to other providers. Reasons behind some customers preference not to limit themselves to their bank, may be related to pricing or convenience factors.

Around 86% of respondents said that their banks continuously update and enhance their current FinTech services and introduce new ones. Banks are encouraged to continue these policies and keep their FinTech services relevant to both, market developments and their customers' requirements.

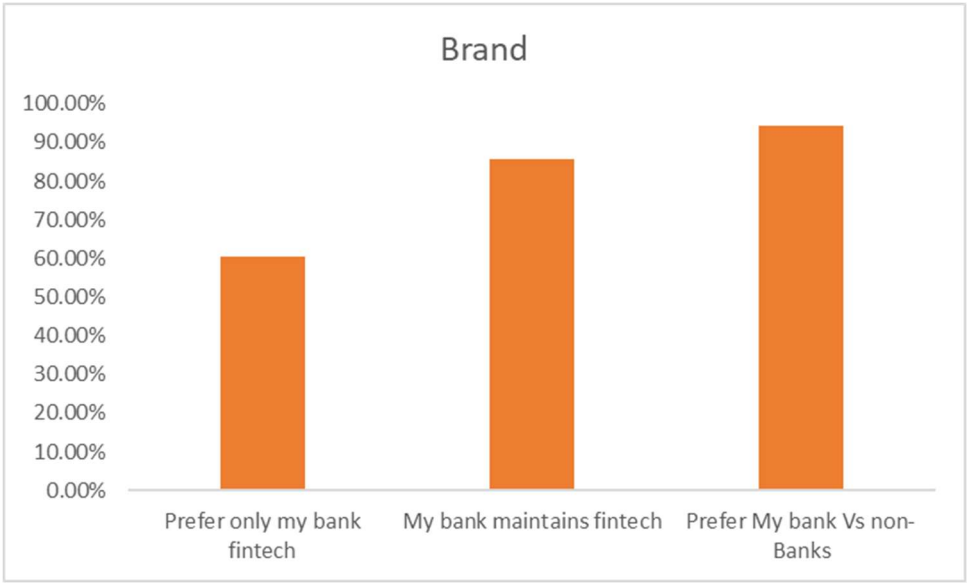

Figure 6. Brand Factor.

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5.1.6.4. Trust.

Trust results from many factors, precision of FinTech services, how secure they are in their users' eyes, and preference of regulatory authorities to oversee and supervise such services, in addition to the perceived safeness of customers when dealing with FinTech provided by banks and non-bank providers (Singh, Sahni and Kovid, 2020; Solarz and Swacha-Lech, 2021).

As Figure 7 shows, nearly 88% of respondents agree and strongly agree that they trust the precision of FinTech services provided by their banks. When asked about how secure FinTech services are provided by their banks, 65% agree or strongly agree that they are secure. On the other hand, 17% think that their FinTech bank services are not secure enough, and another 17% were neutral. Banks are required to ensure cyber security for their FinTech services and spread awareness about it between their customers. Enhancing trust in the security of FinTech services for banks is important. Customers who do not believe in the safeness and confidentiality of their banking information may either choose not to use FinTech services partially or totally, or even move to other service providers. Raising customers' awareness about security and how to respond to cyber risks is important and critical.

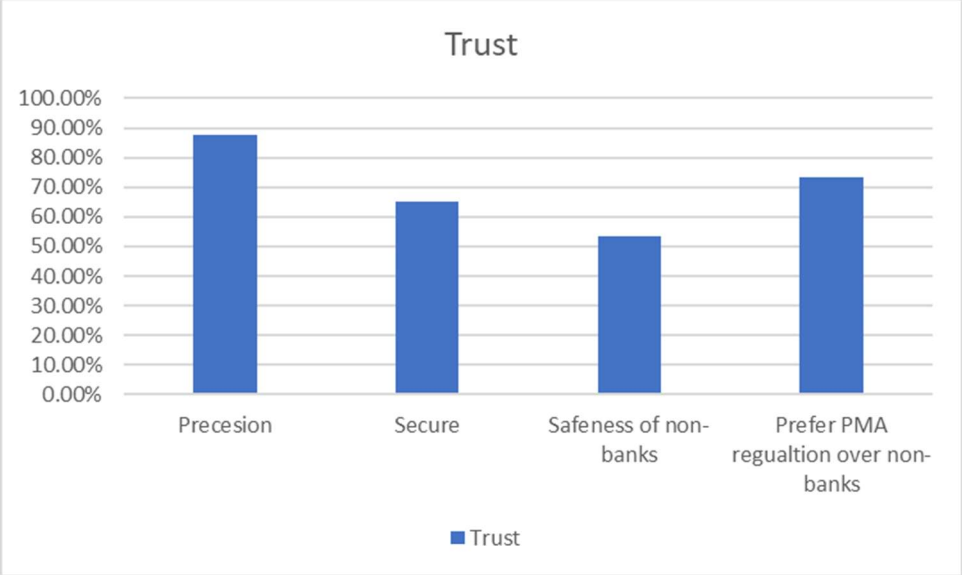

Figure 7. Trust Factor.

5.1.7. Readiness to Change for FinTech.

Customers leave for a variety of reasons, often related to dissatisfaction with the product or service, better offers from competitors, or changes in personal circumstances (Reichheld and Sasser, 1990). Understanding these reasons in the FinTech subject is crucial for banks to improve customer retention strategies.

As shown in Figure 8, 64% of respondents agree or strongly agree that they would consider moving to another bank for the FinTech provision reason. This emphasizes how critical provision of FinTech services is to customers. Banks who fail to respond to customers FinTech provision desires, may lose their customers and hence market share. On the other hand, it is an excellent opportunity for banks to invest in FinTech services provisions, not only to keep market share, but also to strengthen it through the attraction of customers from other banks who fail to timely provide FinTech.

Around 47% said that they may consider moving to non-banking FinTech providers in case their bank fails to provide them and 23% were neutral, meaning there is some opportunity for non-bank providers to provide suitable alternative to banks in the FinTech field. As an example, when asked about receiving funding through non-bank FinTech providers, an identical percentage of around 35% appeared of those who agree or strongly agree, and those who disagree or strongly disagree. This

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shows an openness by customers to deal with even core banking services like funding from non-banks when provided by FinTech.

The findings underscore FinTech provision as a crucial determinant of customer retention, with potential loss of market share for banks that delay in meeting FinTech demands. This also presents a competitive opportunity for those who invest proactively in these technologies.

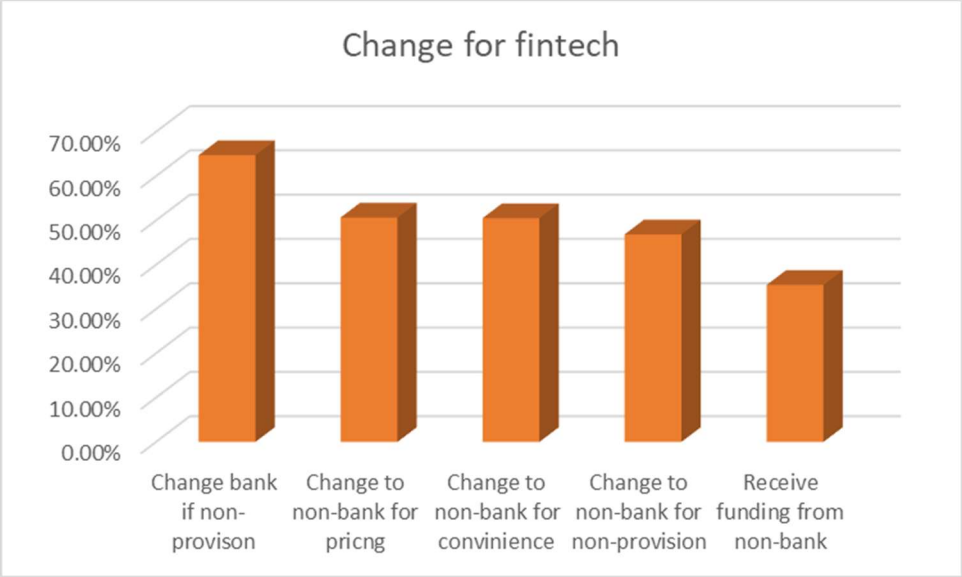

Figure 8. Change bank because of FinTech.

5.1.8. FinTech Awareness

Lee and Shin (2018) emphasized customer awareness of FinTech. This is crucial for its adoption because it directly influences their willingness to engage with and trust new financial technologies. Awareness encompasses understanding the benefits, functionalities, and security measures of FinTech services, which can reduce hesitation and increase adoption rates. Figure 9 shows responses regarding FinTech awareness. Respondents said that they keep themselves updated about FinTech and its providers in Palestine, around 84% responded as agree or strongly agree with this. This shows that customers have the motivation and desire to learn about FinTech services and providers. On the other hand, about the sufficiency of information concerning FinTech in Palestine, respondents' answers show that only around 38% agree or strongly agree about information sufficiency, while 41% do not agree, and 21% were neutral. Results are raising important aspect about FinTech awareness. It is obvious that awareness efforts by stakeholders are not sufficient and do not satisfy customers' expectations. Awareness strategies should be considered by banks, non-bank FinTech providers, and regulators. The more customers are aware, the more adoption rates grow, horizontally by increasing the percentage of users, and vertically by increasing the number of provided services per customer.

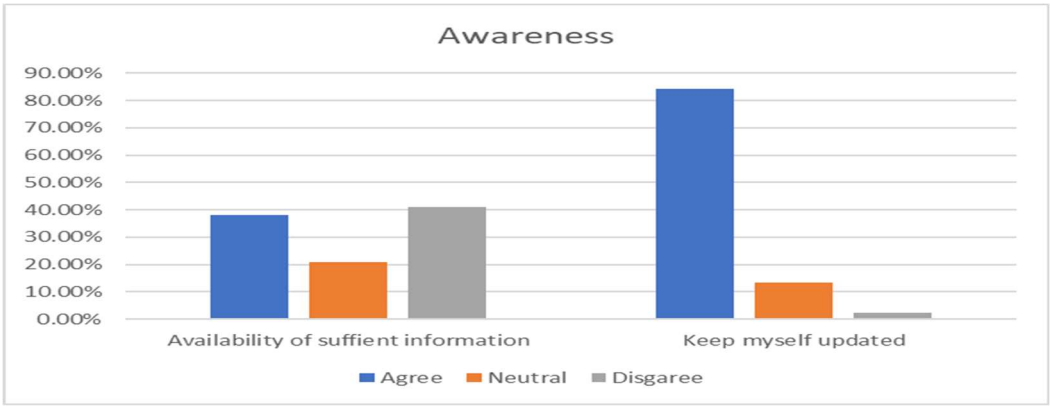

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Figure 9. Awareness Factor.

5.2. Inferential Analysis

Inferential analysis of the sample enables the authors to infer conclusions that can be generalised. Inferential statistics "are the drawing of inferences or conclusions based on a set of observations" (Sutanapong and Louangrath, 2015, p, 22). Using SmartPLS 4 software, this paper used Partial Least Squares Structural Equation Modelling PLS-SEM to analyse the inferential statistics to develop a predictive model. The analysis considers two main parts: first the path modelling and then the bootstrapping procedure.

The purpose of the inferential analysis is to confirm or reject the hypothesis of the extended TAM model as mentioned before.

The model involves investigating the relationships among the latent variables: BR, TR, AW, ES, US, and FA based on 683 cases (all data set) analysed as shown in figures 10 and 11 below.

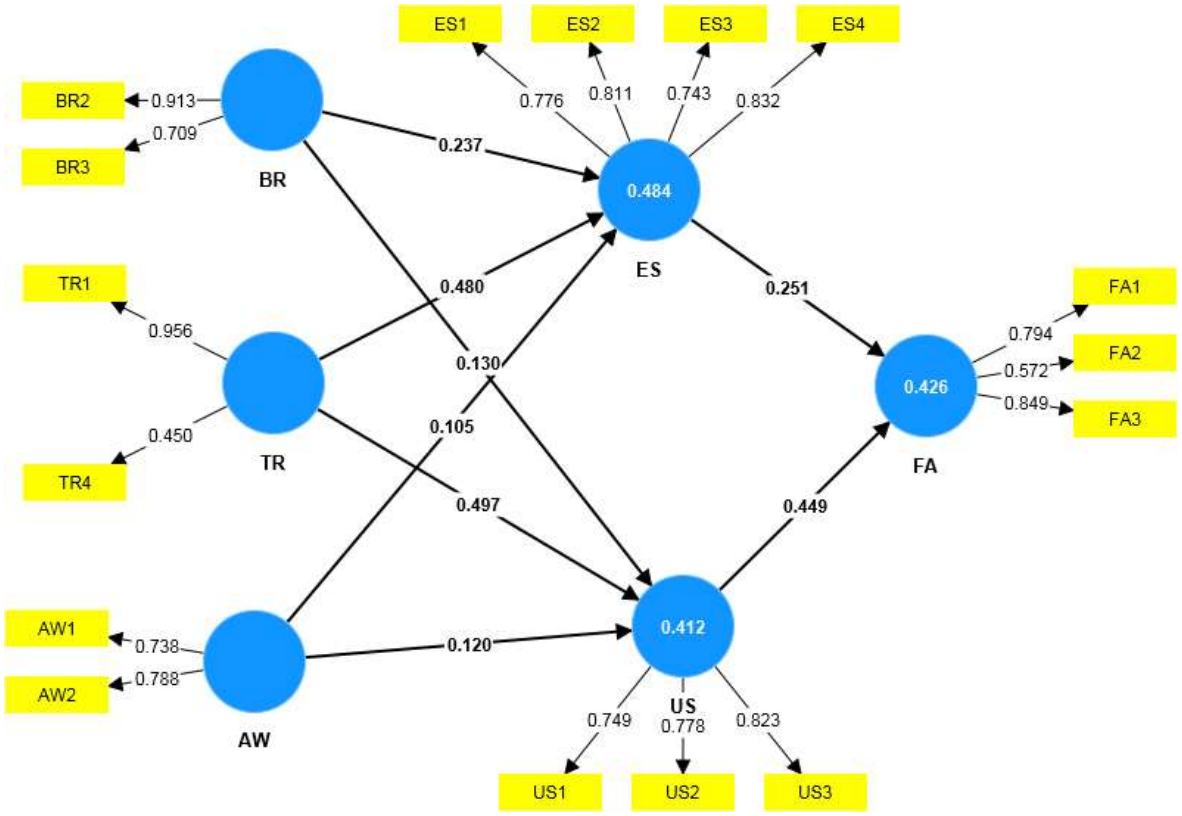

Figure 10. Path algorithm in Overall Model (all dataset).

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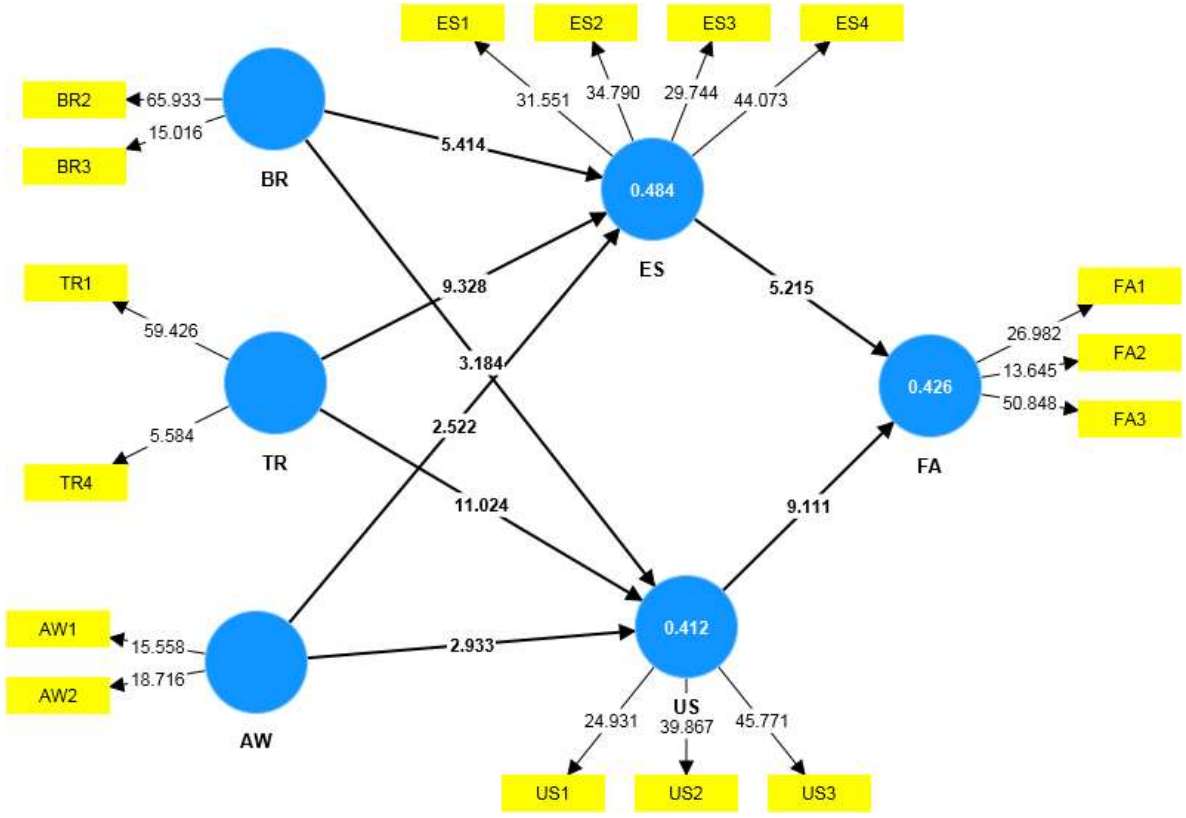

Figure 11. Bootstrapping in the Overall Model (all dataset).

5.2.1. Structure Model

As shown in Table 7 the results of path coefficients indicate good strength of relationships among all variables except for the relationship between the variables AW and ES which is weak. For a structural equation model, the path coefficients between latent variables must satisfy specific criteria. Specifically, the path coefficient must be at least 0.1, and be statistically significant with a p-value of less than 0.05 (Hair et al., 2019).

Table 7. The relationships among the latent variables.

Relationship	Path coefficients
AW -> ES	0.105
AW -> US	0.120
BR -> ES	0.237
BR -> US	0.130
ES -> FA	0.251
TR -> ES	0.480
TR -> US	0.497
US -> FA	0.449

In addition, the Coefficient of determination R^2 indicates how much of the variance in the dependent variables can be explained by the independent variables. This is a crucial metric for assessing the model's overall fit and the intensity of the relationships between variables. Normally the R^2 values above 0.7 indicate a high level of correlation, whereas values below 0.4 indicate a low level of correlation (Hair et al., 2019). The results shown in Table 8 indicate good results of R^2 for the dependent variables ES, FA, US.

Table 8. Coefficient of determination R-squared.

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Variable	R^2	R^2 adjusted
ES	0.484	0.482
FA	0.426	0.424
US	0.412	0.410

These guidelines suggest that the structural equation model is a reasonable fit for the data and that the relationships between variables are robust and meaningful.

Table 9 below indicates that the construct reliability and validity are well established. These indicators are measured by the composite reliability (i.e., its value should be equal or greater to 0.7) and the Average variance extracted AVE (i.e., AVE value should be equal or greater than 0.5). The composite reliability of the TR construct is still accepted is it is rounded up to 0.7 and its AVE is 0.614 which is greater than 0.5.

Table 9. Construct reliability and validity.

Construct	Composite reliability (rho_c)	Average variance extracted (AVE)
AW	0.737	0.583
BR	0.798	0.668
ES	0.870	0.626
FA	0.788	0.560
TR	0.691	0.558
US	0.827	0.614

The results of bootstrapping for the hypotheses testing shown in Table 10, shows that all hypotheses were significant (p value is less than 0.05 at a significance level of 95%).

Table 10. Hypotheses Testing.

Hypothesis	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Results
AW -> ES	0.105	0.108	0.042	2.522	0.012	supported
AW -> US	0.120	0.123	0.041	2.933	0.003	supported
BR -> ES	0.237	0.239	0.044	5.414	0.000	supported
BR -> US	0.130	0.131	0.041	3.184	0.001	supported
ES -> FA	0.251	0.253	0.048	5.215	0.000	supported
TR -> ES	0.480	0.478	0.051	9.328	0.000	supported
TR -> US	0.497	0.496	0.045	11.024	0.000	supported
US -> FA	0.449	0.449	0.049	9.111	0.000	supported

5.2.2. Measurement Model

The results of the Outer Loadings showing in Table 11 indicate that the reflective indicators are well loaded into their respective constructs (variables). The values range between 0.4 to 0.7 are acceptable for exploratory studies while values greater than 0.7 are excellent (Dwaikat et al., 2018).

Table 11. Outer Loadings – All data set.

Indicators/constructs	AW	BR	ES	FA	TR	US
AW1	0.738					
AW2	0.788					
BR2		0.913				
BR3		0.709				

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ES1	0.776		
ES2	0.811		
ES3	0.743		
ES4	0.832		
FA1		0.794	
FA2		0.572	
FA3		0.849	
TR1			0.956
TR4			0.450
US1			0.749
US2			0.778
US3			0.823

6. Discussion

Analysis showed that in agreement with (Puschmann, 2017) conclusions about FinTech drivers, the high percentage of banks' customers use and adoption of FinTech, and technology services provided by their banks, confirms that consumer behaviour has changed and is changing in favour of technology. Customers are not only using their banks FinTech, but a high percentage also (48.5%) responded that they use non-bank provided FinTech. This highlights that customers value FinTech. Findings suggest the sense of urgency for Palestinian banks to invest in FinTech. Stulz (2022) recommended that banks should do their best to effectively use available information technologies to compete and take advantage of their abilities to achieve economies of scale.

Mention (2019) explained that FinTech today bypassed its previous entry stage of promising for financial system expansion by providing financial services to unserved or underserved populations. It is increasingly utilizing the factors of speed, cost, and convenience for its service models to disrupt the incumbent banking system. Research results revealed the readiness of banks' customers in Palestine to change their bank for another bank in response to FinTech provision. Some 64% said they may change to another bank while 47% responded that they may use non-bank FinTech. This adds to the sense of urgency for banks to retain their customers, as failing to provide FinTech solutions to their customers will result in them losing their customer base and market share and may at some stage threaten their ability to stay competitive.

6.1. Extended TAM Verification

6.1.1. Awareness

In accordance with Tiwari, Tiwari, and Gupta (2021) conclusions about the importance of customer awareness, results emphasized that while respondents are highly interested in keeping themselves informed about FinTech in Palestine, they showed a strong opinion about the insufficiency of such information in the Palestinian market. Awareness contributes to the perceived ease of use and perceived usefulness.

Inferential analysis confirmed H1 and H2 related to awareness.

6.1.2. Brand Strength

The results show that brand importance with regards to FinTech provision. Descriptive analysis emphasized that 60% of respondents are interested in consuming FinTech services provided by their banks, and their preference to see their banks, providing FinTech rather than other providers. While results suggest that customers have strong links to their banks' brands, it also shows that a significant percentage of customers (around 40%) do not recognize such strong links. Failing to create customer-brand loyalty introduces significant risks for banks, such matters should be investigated, and mitigating actions should be implemented. The fast and efficient mitigation actions suggested are the investment in FinTech.

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H3 and H4 were also confirmed, such results confirm brand's strong relationship with both ease of use and usefulness, hence fintech adoption for banks' customers, which goes in line with Davis and Venkatesh's (2004) conclusions.

6.1.3. Trust

Trust in the context of the TAM, generally refers to the degree to which a user believes that using a particular system or technology is secure and reliable, and that the provider of the technology is trustworthy. It influences user perceptions of the system's usefulness and ease of use, which are the core determinants of technology acceptance in the original TAM framework (Gefen, Karahanna and Straub, 2003).Results from descriptive analysis support the above description, where 88% of respondents expressed their trust in service precision and reliability, while 65% showed confidence in FinTech security.

Furthermore, inferential analysis showed that both H5, and H6 were supported.

Such results show that banks customers in Palestine, value and trust FinTech services provided by their banks, and think that trust has a significant relationship with both ease of service and usefulness.

Continuing in the path to invest in spreading trust in FinTech services is critical for customer adoption, especially in the efforts of cyber security field, and in the precision and quality of offered services.

6.1.4. Perceived Ease of Use

Results highlighted the importance and relevance of ease of use and its effect on FinTech adoption. Descriptive analysis showed that customers value the high availability of Fintech services and the continuous maintenance and upgrade taking place by their banks, moreover they expressed their satisfaction about support provided by banks for their Fintech services, in addition to the easy experience they enjoy while using them.

The perceive ease of use significant relationship with FinTech adoption represented by H7 was supported, confirming the basic TAM framework.

6.1.5. Perceived Usefulness

Descriptive analysis of responses was in alignment with the literature review discussions about perceived usefulness, which happens when customers think and expect technology to provide an upgrade to their performance (Dhingra and Mudgal, 2019). Responders showed valuing the time efficiency provided by FinTech compared to 'bricks and mortar'. Additionally, responders valued enhanced financial gains resulting from their FinTech adoption, in line with the literature review aspects of cost efficiency and expected higher earnings through FinTech, being another factor that customers perceive as useful (Mangin et al., 2011). It is worth noting that 72% responded positively to enhanced pricing while 11% disagreed and 16% were neutral. This puts further pressure on banks to enhance their FinTech offerings with enhanced pricing, accompanying awareness campaigns to educate customers. Diversity of provided services contributes to the perceived usefulness, and results show that customers perceive such comprehensive diverse services. It is of value to highlight that FinTech services expand rapidly, hence banks need to extend continuous efforts to keep up with Fintech provision and expansion.

Inferential analysis showed that H8 was supported contributing to the confirmation of the TAM framework in the Palestinian banking sector.

7. Conclusions

The descriptive analysis of questionnaire results show that banks' customers have high adoption rates of FinTech services. Additionally, they recognize the ease of use and usefulness factors of FinTech services provided by banks. On the other hand, a significant percentage of banks' customers are executing FinTech transactions provided by non-bank providers, and a higher percentage are

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willing to move to non-bank providers for ease of use and/or usefulness factors including the preferred pricing and time saving. An important factor of the ease of use, which is the provision of support to FinTech services, needs the special attention of banks and FinTech providers, this is because a significant percentage of customers were neutral or disagreed about its adequate provision. On another subject, banks are required to consider preferred pricing and communicate this subject to their customers properly.

On the brand factor, many banks' customers are content receiving FinTech services from other banks or non-bank providers, while they prefer to have their banks provide them in the first place. Banks are advised to accelerate their FinTech plans to retain their customers and be able to attract customers from those banks who are not fast enough.

Bank customers place greater trust and confidence in their respective banks compared to non-bank FinTech providers, but both still need to invest in the security aspects of FinTech and raise the confidence of their customers. One preferred option by customers of non-bank providers is to have them under the regulation and supervision of the PMA.

Many customers are willing to change their banks for FinTech provision reasons, either to other banks or to non-bank FinTech providers. Reasons that may drive customers to move are non-provision of FinTech which comes first, followed by pricing and convenience.

Findings indicate that customers FinTech awareness is low and requires special attention. It is recommended that awareness plans be put in place. It is worthwhile mentioning the high percentage of customers' readiness and willingness to keep themselves updated about FinTech and its providers.

Inferential analysis confirmed the extended TAM model's applicability in the Palestinian banking sector. All hypotheses were confirmed, where brand, trust and FinTech awareness were found to have significant relationships with both perceived ease of use and perceived usefulness. Furthermore, perceived ease of use and perceived usefulness were in turn confirmed to have a strong relationship with customers' intentions to adopt FinTech.

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