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Technology Use in Finance: Continuation Intention in Fintech Applications, Türkiye Example

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Abstract

All sectors have to change and develop depending on technological change. The reason for this change is sometimes competition, sometimes achieving a longer economic life, and sometimes facilitating the current conditions. The intensity of use of financial markets and products is evaluated by financial participation. Technology has an important position, especially in increasing the use of financial products. Reasons such as time saving, ease of use, economic benefits, etc., which increase usage by consumers, are improving the demand for fintech applications. The study aims to evaluate the behavioral factors that may affect fintech applications, which are expressed as financial technology, and ensure their continued use. In this context, it was aimed to evaluate the effects of behavioral factors such as security, risk, convenience, benefit and brand image on individual fintech usage. Study data was obtained through surveys administered to 779 people, and SPSS and Jamovi statistical programs were used to analyze the data. In the analysis of the data, explanatory factor, confirmatory factor analysis and structural equation modeling analysis methods were applied. As a result of the analysis, the factors affecting individuals' use of Fintech were determined as perceived ease of use, perceived benefit and brand image.

Keywords: Fintech, Behavioral Factors, Technology, Finance, Structural Equation Model

Jel Code: G40, G41, G50

Finansta Teknoloji Kullanımı: Fintech Uygulamalarında Devam Niyeti, Türkiye Örneği

Öz

Teknolojik değişime bağlı olarak tüm sektörler değişim ve gelişim içerisinde bulunmak durumundadırlar. Bu değişimin nedeni kimi zaman rekabet, kimi zaman uzun ekonomik ömür elde etme kimi zaman ise içinde bulunulan şartların kolaylaştırılmasıdır. Finansal piyasaların ve ürünlerin kullanım yoğunluğu finansal katılımla değerlendirilmektedir. Teknoloji özellikle finansal ürünlerin kullanımının artırılmasında önemli bir konuma sahiptir. Tüketiciler tarafından kullanımı artıran zaman tasarrufu, kullanım kolaylığı, ekonomik fayda sağlaması vb. nedenler fintech uygulamalarının talebini geliştirmektedir. Çalışmada finansal teknoloji olarak ifade edilen fintech uygulamalarını etkileyebilecek ve kullanım devamını sağlayabilecek davranışsal faktörlerin değerlendirilmesi amaçlanmıştır. Bu kapsamda güvenlik, risk, kolaylık, fayda ve marka imajı gibi davranışsal faktörlerin bireysel fintech kullanımları üzerindeki etkileri değerlendirilmek istenmiştir. Çalışma verileri 779 kişiye yapılan anketlerle elde edilmiş ve verilerin analizinde SPSS ve Jamovi istatistik programından faydalanılmıştır. Verilerin analizinde açıklayıcı faktör, doğrulayıcı faktör analizleri ve yapısal eşitlik modeli ile analiz yöntemleri uygulanmıştır. Analiz sonucunda

bireylerin fintech kullanımları üzerinde etkili olan faktörler algılanan kullanım kolaylığı, algılanan fayda ve marka imajı olarak belirlenmiştir.

Anahtar Kelimler: Fintech, Davranışsal Faktörler, Teknoloji, Finans, Yapısal Eşitlik Modeli

Jel Kodu: G40, G41, G50

Introduction

The system that facilitates the use of financial services within the scope of time and cost and provides access to financial products with technological infrastructure is called financial technology, that is, fintech. The term Fintech reflects the development of a transformation resulting from developments in information technology (Puschmann, 2017). The main factors enabling this transformation include the changing role of information technologies, changing consumer behavior, changing ecosystems, and changing regulations (Alt and Puschmann, 2016). Information is the main factor that increases the accessibility and usability of financial products in financial markets. Fintech enables this information to be delivered to individuals more quickly and reliably through technology and innovation. On the other hand, fintech applications provide convenience to financial actors in the secure storage of information, which is an important problem and challenge for the financial sector, thanks to technological developments.

Finance has been characterized by technology throughout its history (Ferguson, 2018). The rise of new technology and compliance has brought about changes in many of the core functions of modern finance, and technological advances have fundamentally changed the functioning of the financial sector (Leinweber, 2009). Financial technologies play a special role in the modern transformation of the financial system, helping to improve financial activities and increase their profitability. The main feature of financial technologies is their ability to create innovations in the financial system (Azarenkova et al., 2018).

Increasing financial inclusion is one of the main goals of financial market actors. Today, financial inclusion is a goal that all countries should achieve, and it is believed that financial inclusion has a positive impact on economic growth and social welfare (Risman et al., 2021). Therefore, the proliferation of fintech applications has a significant impact on financial inclusion. It is said that there are approximately 2.7 billion people unbanked worldwide. Financial institutions make a significant contribution to the economy, and easy access to financial services can help different

markets fight poverty and economic development (Aymar and Fabrice-Gilles, 2021). Fintech is a digital intermediary that can include people who are excluded from financial markets, who do not benefit from financial services enough, or who are unaware of these services, into the financial system.

Behavioral intention towards usage has become a vital element in the financial services sector, especially for users to adopt and use fintech services. Behavioral intention affects the usage pattern (Peong et al., (2021). This study aims to determine the behavioral factors that are thought to have an impact on the usage behavior of individuals' fintech applications based on financial technology infrastructure.

Fintech in Türkiye

Information technologies are an important tool for the use and dissemination of financial technology. According to the household information technologies usage survey in Turkey, while the internet usage rate was 87.1% among individuals aged 16-74 in 2023, this rate became 88.8% in 2024 (TÜİK, 2024). On the other hand, according to the digital, internet and mobile banking statistical data published by the Banks Association of Turkey in May 2024, the number of customers using active digital banking services on an individual and corporate basis in the January-March 2024 period was 113 million 630 thousand people. In the report, the number of customers who registered to the system for internet banking and logged in at least once was approximately 101 million people in March 2024. In addition, the report shows that the total number of financial transactions made using internet banking services in the period covering January-March 2024 was 128 million and the amount was 10 trillion 430 billion (TBB, 2024).

According to data from Fintech Istanbul, which conducts training and research on fintech in Turkey, the banking and finance applications with the highest user scores are listed as follows (FintechIstanbul, 2024):

1-Papara: Financial Services

2-Vakıfbank Mobile Banking

3- Binance

4- Yapı Kredi Mobile- SuperApp

5- Garanti BBVA Mobile Banking

6- Mobile Deniz

7- QNB Mobile- Digital Bridge

8- Ziraat Mobile

10- Midas: Stock Exchange ShareTrading

Table 1. Mobile Banking Investment Transactions in Türkiye

	January-March 2023		**October-December 2023**		**January-March 2024**	
	Number of Transactions (Thousand)	Transaction Volume (Billion TL)	Number of Transactions (Thousand)	Transaction Volume (Billion TL)	Number of Transactions (Thousand)	Transaction Volume (Billion TL)
Mutual Funds	10.099	407	17.819	795	22.488	1.218
Currency T.	21.158	354	21.198	380	20.957	426
Forward Acc.	9.388	810	12.806	1.507	14.786	1.821
Stock Trns.	79.365	1.489	167.139	2.535	168.872	3.231
Repo Trns.	42	6	40	9	48	12
Bond and Bill Trns.	794	86	1.331	149	1.634	214

Gold	8.242	116	7.349	123	8.381	156
VIOP	598	78	680	110	661	125
Total	129.686	3.3347	228.394	5.608	237.827	7.204

Source: Turkish Banks Association

Considering the data in Table 1, it is seen that there is a clear difference in investment transactions made via mobile banking in Turkey between the January-March 2024 period and the January-March 2023 period, both in terms of the number of transactions and the volume of transactions. In the January-March 2024 period, stock transactions are the most notable mobile investment transactions. When we look at the number of transactions and transaction volumes in total mobile banking, it can be said that there was an approximately two-fold increase in the January-March 2024 period compared to the January-March 2023 period.

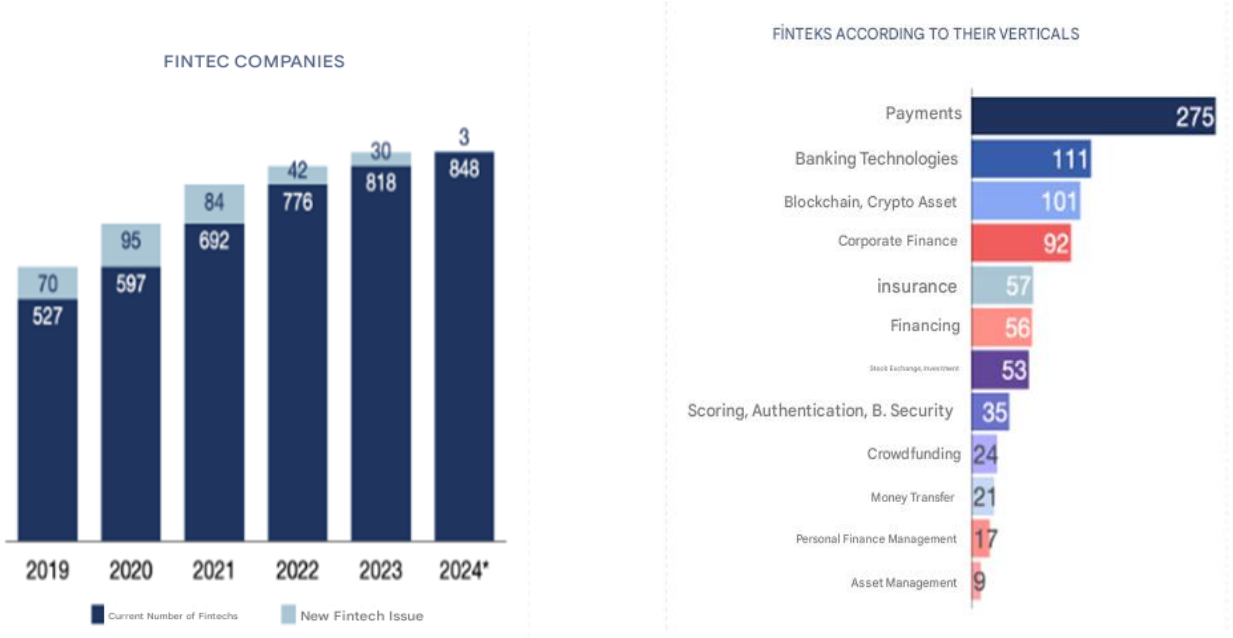

Figure 1. Number of Fintech Companies in Türkiye

Source: Republic of Türkiye Presidency Finance Office

Considering the number of financial technology companies in Turkey, these values are calculated in Figure 1 as 527 in 2019, 692 in 2021 with a 16% increase compared to the previous year, 818 in 2023 with a 5% increase compared to the previous year, and 848 in 2024 with a 4% increase compared to the previous year. The distribution of fintech companies is as follows: payments 275, banking technologies 111, blockchain, crypto assets 101 companies.

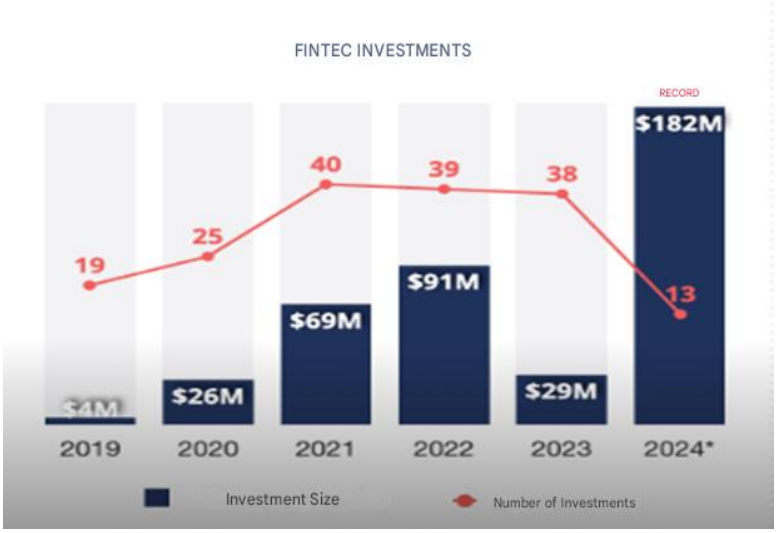

Figure 2. FintechInvestment Size and Number in Türkiye

Source: Republic of Türkiye Presidency Finance Office

Figure 2 shows the size and number of investments made in Fintech in Turkey. While the amount of investment made in this field in 2019 was 4 million dollars, this figure was realized as 182 million dollars in 2024. Over the years, it is observed that while the number of investments in financial technology has decreased in recent years, the budget allocated to investments has increased.

Literature

Arner et al. (2016) state that fintech covers not only individual sectors but also the entire spectrum of financial services and products. Risman et al., (2021) stated in their study that digital finance has a positive impact on financial stability by increasing the ability of banks to provide financing. Jonas Feller et al. (2017) discussed how the fintech sector has risen globally and stated that fintech applications in the Middle East and North Africa increased the number of enterprises providing business services in the region from 46 in 2013 to 105 in 2015. Hussein (2020) reported in his

study in Egypt that interoperable digital payment systems can offer lower-cost transactions, increase the competitiveness of payment providers and increase payment efficiency. Kurniasari et al. (2021) stated in their study in Indonesia that fintech strengthens financial inclusion by increasing the influence of businesses and at the same time enabling SMEs to obtain loans for their businesses.

Adedokun and Agha (2023) reported that when all groups in society, such as the poor and the vulnerable, have easy access to financial services such as credit and savings, the system can be considered inclusive and have achieved widespread financial inclusion. Telukdarie and Mungar (2023) stated that the use of digital financial technology will provide access to financial services for residents in hard-to-reach areas such as urban areas, which will increase their standard of living. Hudaefi (2020), in his study on existing Islamic financial credit technologies in Indonesia, reported that fintech companies promote the idea of financial accessibility by financing underdeveloped sectors such as agriculture and micro-enterprises.

Jin et al. (2019), in a study that determined the factors affecting consumers' preferences in fintech applications in Malaysia, found that perceived benefit, ease of use, relative advantage, perceived risk and perceived cost significantly affected the use of fintech products. Fusaro et al. (2012) stated that understanding how well fintech is performing is mostly through people's trust in the sector. Siau and Shen (2003) stated that fintech service providers should be responsible for developing a strong level of trust by offering high-level benefits to their users. Kim et al. (2010) also stated that the main benefits for fintech users are convenience and accessibility.

Eiser et al. (2002) argued that previously acquired knowledge about the technology should be communicated to new adopters to reduce their uncertainty. Kim et al. (2008) suggested that the risk associated with fintech and e-commerce positively affects demand, but the nature of the risk in fintech and e-commerce is the same. Fusaro et al. (2002) stated that the adoption and success of fintech is mainly based on user trust, which is why it is concerned with data privacy and financial transactions. Khatun and Tamanna (2020), in their study on the adoption of fintech, stated that users' ease of use of fintech depends on their comfort and security.

Fernando (2019) stated that according to the results of structural equation analysis, perceived benefit, trust and perceived ease of use are the main factors affecting users' decisions to use fintech services. Khuong et al. (2022) stated in their study on fintech users that the intention to continue

using fintech is positively related to the benefits of fintech and is negatively affected by the risks it provides. Al Nawayseh (2020) reported in his study that a customer's intention to use fintech applications is affected by his perception of benefit, social impact and trust. Wu and Wang (2005) found a significant relationship between perceived risk and the intention to use mobile payments. Li et al. (2020) confirmed that the probability of using mobile payments will increase with risk tolerance. Solarz and Swacha-Lech (2021) stated that their study showed that perceived benefit positively affects fintech adoption.

Methodology

Research Design and Sample

This study aims to determine the factors affecting consumer awareness and usage of fintech products and services in Turkey. A quantitative survey method was used for the purpose of the research. The scales in the survey were selected from previous studies. Perceived usage scale, Hu et al. (2019), Kanchanatanee et al. (2014) and Niu et al. (2020), perceived usefulness scale, Elhajjar and Ouaida (2020) and Singh et al. (2020), user innovation scale, Zhann et al. (2018), continuance intention scale, Goo and Heo (2020) and Marakarkandy et al. (2017), brand image scale, Caviggioli et al. (2020) and Hu et al. (2019), security risk and economic benefit scales, Featherman and Pavlou (2003) and Lee (2009), convenience scale were cited from the works of Okazaki and Mendez (2013).

A five-level Likert scale ((1) strongly disagree; (2) disagree; (3) neither agree nor disagree; (4) agree; (5) strongly agree) was used to assess the attitudes of the survey respondents. SPSS and Jamovi statistical software were used to analyze the relevant data. Data were collected through random sampling. Survey participants were comprised of employed individuals aged 21 and over who either used fintech or did not use it at all. Surveys were sent to participants online and they were asked to answer them online. 779 surveys that were ready for analysis in the data pool created by receiving feedback from the participants were included in the study.

Research Model and Hypotheses

Based on the literature review, a model was created that shows the factors affecting the continuance intention of using financial technology. The model consists of six constructs that we assume have

an impact on the continuance intention of using fintech. These constructs include: security risk, perceived ease of use, perceived benefit, economic benefit, user innovation, and brand image.

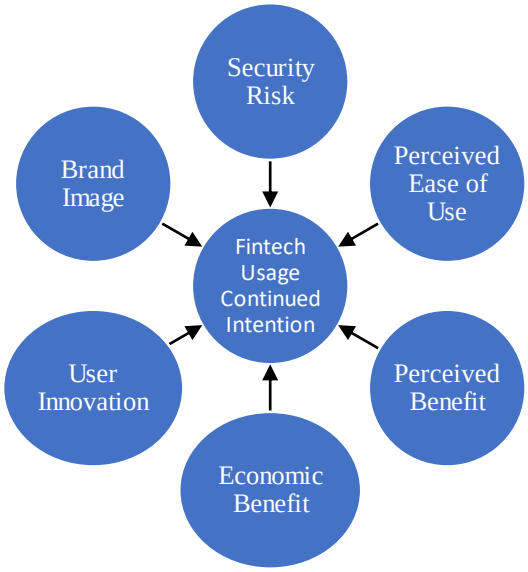

Figure 3. Research Model

Based on the developed theoretical model, the following research hypotheses were created:

H_1: Security risk has a negative effect on fintech continuation intention.

H_2: Perceived ease of use has a positive effect on fintech continuation intention.

H_3: Perceived benefit has a positive effect on fintech continuation intention.

H_4: Economic benefit has a positive effect on fintech continuation intention.

H_5: User innovation tendency has a positive effect on fintech continuation intention.

H_6: Brand image effect has a positive effect on fintech continuation intention.

Findings

Table 2 shows that 72.7% of the participants were male, 62.3% were between the ages of 31-39, 52.8% were university graduates, 32.9% were high school graduates, 70.4% were married, 36.6% had an income level of 40,000 TL, and 50.2% had extensive fintech usage experience.

Table 2. Sample Demographics

Profil	***f***	**%**
Gender		
Male	567	72.7
Female	212	27.3
Age		
21-30	294	37.7
31-39	485	62.3
Education		
High School and below	256	32.9
University	412	52.8
Graduate	111	14.3
Marriage Status		
Married	549	70.4
Single	230	29.6
Monthly Income		
25,000 TL and below	174	22.3
25,000-40,000 TL	285	36.6
40,000 – 55,000 TL	192	24.6
55,000 TL and above	128	16.5
Fintech Usage Experience		
Never used	85	10.9

I used it once	124	15.9
I used it 2-3 times	179	23.0
I used it more than 4 times	391	50.2

In Table 3, the factor loadings, Cronbach Alpha and mean variance values of the evaluated model were calculated. According to Hair et al. (1998), factor loadings are important and for item reliability, factor loadings must be 0.70 or higher. When the factor loadings of the scales in the model are examined, it is seen that the values are more than 0.70. When the Cronbach alpha coefficients of the scales are taken into consideration, the values show a solid reliability level between 0.846 and 0.959. AVE values should exceed 0.50 in order to be sufficient for convergent validity (Edition, Fornell & Larcker, 1981; Bagozzi, 1988; Ringle & Sinkovics, 2004). When the table values are examined, it is seen that all of these values are above 0.50.

Table 3. Confirmatory Factor Analysis for the Measurement Model

Scales	**Items**	**Factor Loadings**	**Cronbach Alpha**	**AVE**
Security Risk	GR1	0.881		
	GR2	0.842	0.893	0.795
	GR3	0.822		
Perceived Ease of Use	AKK1	0.951		
	AKK2	0.945		
	AKK3	0.940	0.954	0.868
	AKK4	0.942		
	AKK5	0.945		
	AKK6	0.950		

Perceived Benefit	AF1	0.949		
	AF2	0.952		
	AF3	0.948	0.959	0.869
	AF4	0.953		
	AF5	0.951		
	AF6	0.952		
Economic Benefit	EF1	0.843		
	EF2	0.737	0.846	0.724
	EF3	0.773		
User Innovation	KY1	0.803		
	KY2	0.846	0.855	0.731
	KY3	0.739		
Brand Image	Mİ1	0.901		
	Mİ2	0.790	0.881	0.816
	Mİ3	0.807		
Intention to Continue	DN1	0.932		
	DN2	0.918	0.947	0.907
	DN3	0.926		
	DN4	0.946		

Structural Model Results

Fit indices provide descriptive, i.e. non-inferential values of model fit (Peugh and Feldon 2020). Various statistics such as land statistics, GFI, TLI, CFI and RMSEA in research analyses were used to determine goodness of fit indices (Hu and Bentler, 1999). Table 4 shows the fit indices for the measurement and structural models. It is seen that the measurement models produce good-level compatible results. The table values show that the goodness of fit values are within acceptable limits.

Table 4. Model Fit Values

Index	Value	Acceptable range	Reference
Cmin/df	1.22	<3	Bentler and Bonett (1980)
GFI	0.996	>0.8	Hooper et al. (2008)
TLI	0.999	>0.9	Forza and Filippini (1998)
CFI	0.999	>0.9	Quintana and Maxwell (1999)
RMSEA	0.052	<0.08	Hu and Bentler (1999)

The correlation matrix presented in Table 5 provides information on the relationships between different variables denoted as GR, AKK, AF, EF, KY, MI and DN. Each cell contains a correlation coefficient showing the strength and direction of the relationship between certain pairs of variables. It is observed that there is a significant and positive relationship between the security risk scale and perceived ease of use and perceived benefit, between perceived ease of use and perceived benefit, economic benefit, user innovation, brand image and continuance intention, between perceived benefit and economic benefit, user innovation, brand image and continuance intention, between economic benefit and user innovation, brand image and continuance intention, between user innovation and brand image and continuance intention, and between brand image and continuance intention. Among the observed values, the highest correlation is observed between perceived ease of use and perceived benefit (0.927) and between brand image and continuance

intention (0.840), while the lowest correlation is observed between security risk and perceived benefit (0.221) and perceived ease of use (0. 271).

Table 5. Correlation Matrix

		SR	PEU	PB	EB	UI	BI	IC
SR	Pearson's r	—						
	p-value	—						
PEU	Pearson's r	0.271*	—					
	p-value	0.013	—					
PB	Pearson's r	0.221*	0.927***	—				
	p-value	0.044	< .001	—				
EB	Pearson's r	0.158	0.738***	0.803***	—			
	p-value	0.152	< .001	< .001	—			
UI	Pearson's r	-0.050	0.387***	0.334**	0.491***	—		
	p-value	0.651	< .001	0.002	<.001	—		
BI	Pearson's r	-0.008	0.722***	0.701***	0.626***	0.526***	—	
	p-value	0.945	< .001	< .001	<.001	<.001	—	
IC	Pearson's r	0.045	0.803***	0.778***	0.719***	0.553***	0.840***	—
	p-value	0.686	< .001	< .001	< .001	< .001	< .001	—

*** p <,05, ** p <,01, *** p <,001**

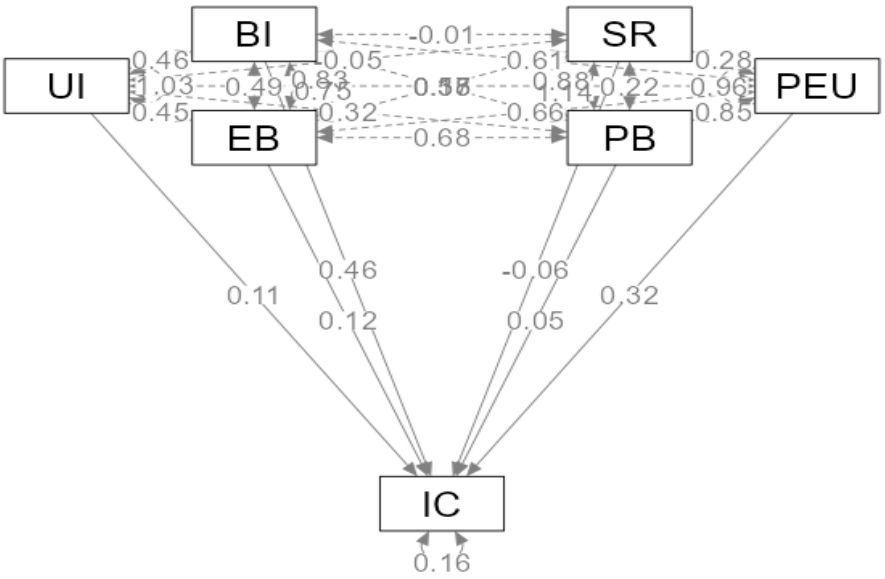

Figure 4. Structural Equation Model Path Diagram

In the analysis conducted with the Structural Equation Model, the hypotheses H_2, H_5 and H_6, whose p values of the variables included in the research model are less than 0.05, were accepted. The factors thought to be effective on the intention to continue using fintech were determined as perceived ease of use, user innovation and brand image. The analysis revealed that security risk, perceived benefit and economic benefit had no effect on the intention to continue using fintech. When the Beta coefficients showing the path coefficient of the hypothesis were examined, it was seen that perceived ease of use had a moderate positive effect of 0.33 and brand image had a moderate positive effect of 42% on the intention to continue using fintech.

Table 6. Path Analysis Results

Hipotez	Std.Estimate	SE	β	P-value	Sonuç
H_1=SR→ IC	-0.0568	0.0446	-0.0658	0.203	Reject
H_2=PEU→ IC	0.3153	0.1292	0.3350	0.015	Accept
H_3=PB→ IC	0.0492	0.1469	0.0500	0.737	Reject

H_4=EB→	**IC**	0.1167	0.0882	0.1150	0.186	Reject
H_5=UI→	**IC**	0.1115	0.0553	0.1225	0.044	Accept
H_6=BI→	**IC**	0.4551	0.0826	0.4261	0.000	Accept

Note on Abbreviation: SR: Security Risk, PEU: Perceived Ease of Use, PB: Perceived Benefit, EB: Economic Benefit, UI: User Innovation, BI: Brand Image, CI: Continuance Intention

Conclusion

Fintech is a new financial market actor that combines technology and financial services. It is important to understand fintech adoption factors to support financial inclusion and financial resilience with innovative fintech solutions (Mahmud et al., 2022). The analysis findings focus on behavioral factors that are thought to have an impact on fintech continuation intention. The behavioral factors whose impact is investigated are evaluated by dividing them into two groups as perceptual and non-perceptual. Perceptual factors are considered as security risk, ease of use and benefit, while non-perceptual factors are considered as economic benefit, user innovation and brand image. The term technology includes elements that can affect behaviors such as innovation, convenience, trust and economic benefit. When the results of the research are examined, it is seen that fintech users in Turkey do not have any concerns about security risk, they want to save time due to ease of use, they want to gain image due to innovation and they intend to use new technological financial products immediately. It can be said that the results obtained are directly proportional to the policies of technology companies. For technology companies, gaining customer trust is one of the keys to building a long-term relationship with customers and is the path to sustainability of a fintech company (Firmansyah et al., 2022).

One of the limitations of the study is the small sample size due to limited time. The sample size of 779 people is limited to understand the behavioral intentions of fintech users in Turkey. Therefore, it is recommended that studies in this area be conducted over a longer period of time and with a larger sample size. On the other hand, considering issues such as data and transaction security at lower dimensions depending on the development of technology may be important for future studies. In terms of practical implications, our study, which attempts to reveal the behavioral intention to use fintech services, offers important implications for fintech companies and other stakeholders in the sector. In addition, it should not be forgotten that the degree of trust that

individuals participating in the study have in the use of fintech technology is important for the future of fintech companies, and it is important for companies to further increase this trust.

As a result, behavioral factors that affect people as a whole and are the basis of almost all decisions have an impact on the intention to continue using fintech. People's desire to move away from the classical banking approach and reach financial services in a faster and more practical way has led them to use financial technology. On the other hand, it can be said that individuals in Turkey are informed about fintech companies, accept to use fintech services of familiar brands and accept the brand image of fintech. Therefore, the current study aims to contribute to the literature by determining the perceptual and non-perceptual factors that affect individuals' intention to continue using fintech services, taking into account traditional behavioral characteristics.

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