Ahmet Kamil Kabakuş
Ataturk University
Faculty of Economics and
Administrative Sciences
25240 Erzurum, Turkey
kkabakus@atauni.edu.tr

Hasan Küçükoğlu
Ataturk University
Faculty of Economics and
Administrative Sciences
25240 Erzurum, Turkey
hasan.kucukoglu@ogr.atauni.edu.tr

THE EFFECT OF TRUST ON MOBILE BANKING USAGE: THE MEDIATING ROLES OF PERCEIVED USEFULNESS AND PERCEIVED EASE OF USE

Abstract

Purpose: This study primarily examines the mediating effect of perceived usefulness and perceived ease of use on the relationship between trust and mobile banking use.

Methodology: For this purpose, university students studying at different levels at a state university in Turkey were chosen as the research population and the data were collected through a field study using a convenience sampling method and a face-to-face survey technique. SEM data analysis was conducted by using SPSS v20 and AMOS v20.

Results: The findings revealed a direct and positive relationship between the trust factor and mobile banking platform usage, and that the factors of perceived usefulness and perceived ease of use have a partial mediating effect in this relationship.

Conclusion: As a result, it is predicted that many different factors affect user preferences in the use of mobile banking platforms, these factors directly or indirectly affect compliance, adoption, and use, and it is necessary to focus more on these factors for the future of banking with the effect of digitalization.

Keywords: Mobile banking, trust, perceived usefulness, perceived ease of use, intermediary role

1. Introduction

Technology has become an essential part of daily life with digitalization (Alkan et al., 2021). The effect and control of these developments is a fundamental issue, especially in the developing countries (Çelik & Kabakuş, 2015). Parallel to these developments, it is also observed that people's attitudes and behaviors towards the banking sector differ.

The mobile banking platform, where financial transactions are offered independently of space and time, is one of the essential conveniences of this change. Despite its advantages, it is not easy for people to

adapt to these changes for several reasons (Tan et al., 2016). It can be said that the difference in the attitudes and behaviors of users regarding the use of mobile banking in banking transactions stems from different factors such as culture, environment, lifestyle, demographic factors, psychological reasons, government policies, and legal dimension (Dymi, 2012).

With the technological developments and widespread use of digital platforms, how people adapt themselves to this technology is an increasingly popular field of study and meaningful results have been obtained (Zalloum et al., 2019). Studies focused on university students that follow current trends closely are essential in terms of short- and long-term implications (Shanmugam et al., 2014). Studies in this concept are also predicted to have important theoretical and practical implications for understanding user-centered factors affecting the adoption of mobile banking and payment methods (Shankar & Datta, 2018). In addition, it is pretty clear that the effects of the digitalization process are also crucial in terms of understanding the behavioral intentions of users towards mobile banking adaptation, especially in developing countries (Sharma, 2019). For this reason, studies based on the digitalization effect provide critical and valuable information to service providers and users (Cheah et al., 2011).

One of the popular models used to examine external factors on individuals' use and adoption of new technology is the Technology Acceptance Model (TAM). In a study using this model, it was observed that trust had a negative effect on perceived risk, and perceived risk had a negative effect on internet banking adoption (Kesharwani & Singh Bisht, 2012). In another study using the TAM, it was found that trust had a significant effect on the acceptance of internet banking (Suh & Han, 2002). Moreover, in another study using the same model, it was concluded that trust positively affected the intention of using internet banking services, but perceived ease of use did not affect the intention of using (Al-Sharafi et al., 2016).

Davis (1985) claims that user motivation can be explained by attitude, perceived usefulness, and perceived ease of use. It is accepted that the user's attitude towards the internet is affected by perceived usefulness and perceived ease of use. Davis et al. (1989) also reveals that users prefer using new technology or system because they believe that it will be useful to them for doing their jobs better (perceived usefulness) and that the effort required to use the system (perceived ease of use) can directly affect their system usage behavior.

In this context, the study aims to determine the mediating effects of the factors of perceived usefulness and perceived ease of use, which are thought to affect the willingness to use mobile banking, in the relationship between trust and mobile banking usage. For this reason, university students were preferred as the research universe as they were considered to be more suitable in terms of technological aptitude and awareness. Therefore, the study can contribute to the theories developed for the mediating effects of perceived usefulness and perceived ease of use in the relationship between trust and mobile banking use and their examination by using two different models.

2. Conceptual framework

Many factors affect mobile banking adaptation of users in the banking sector transformed by digitalization. In the literature, studies in this context generally focus on lifestyle, ease of use, usability, practicality, portability, flexibility, reliability, cost, factors, etc. (Olasina, 2015).

In the study examining the mediating effects of perceived usefulness and perceived ease of use on mobile banking usage, it was stated that system compatibility, awareness, and high-risk perception positively affect user attitudes and intentions (Thakur, 2014). In another study investigating the mediating role of gender in mobile banking adaptation, it was stated that women preferred this channel because of its ease of use, while men's preferences were based on its relative advantage (Riquelme & Rios, 2010).

Researchers examining mobile banking adaptation of different generations in Thailand stated that Generation Y individuals' lifestyle fit and perceived usefulness positively affected their preferences, while trust and ease of use negatively affected their preferences (Ruangkanjanases & Wongprasopchai, 2017). In the study examining mobile banking behaviors of Generation Y individuals, it was concluded that social media promotions and advertisements do not affect banking channel preferences, but a directive mobile communication channel can be beneficial (Hussain & Wong, 2015). Again, in another study on Generation Y individuals, it is

concluded that while the pleasure of using mobile banking affects behavioral intention positively, its reliability affects negatively (Boonsiritomachai & Pitchayadejanant, 2019).

In a study conducted with university students working in a private bank in Turkey, it is concluded that the participants want to prefer channels which are less risky and safer for transactions made from digital banking platforms (Kabakuş & Küçükoğlu, 2019a). In a study conducted jointly in Azerbaijan and Turkey, it is determined that income level, social environment and technology aptitude affect banking channel preferences of users (Hajiyev & Chang, 2017).

In the study investigating the mediating roles of demographic features in mobile banking acceptance, it is claimed that users' first impressions of trust affect behavioral intention, but demographic factors do not impact initial trust and willingness (Chiu et al., 2017). The mediating role of attitude towards behavioral intention in mobile banking usage is examined and it is stated that perceived usefulness and ease of use do not affect intention at a significant level, perceived reliability is effective in terms of adaption, and people mostly refuse to adapt thereto because of perceived risk (Shanmugam et al., 2014). In the study examining the mediating role of perceived usefulness and ease of use on attitude, it is stated that resistance affects ease of use and risk affects the benefit negatively (Raza et al., 2017).

In a study conducted in Jordan, where perceived trust is used as a mediator on intention to use, it is claimed that perceived usefulness and ease of use affect intention significantly and positively through the trust factor (Al-Sharafi et al., 2017). The study investigating the mediating role of perceived trust in mobile banking usage reveals that online rumors, ease of navigation, personalization,

information quality and rewards affect usage (Zalloum et al., 2019). Another study investigating the mediating role of factors in mobile banking use states that self-efficacy affects adaptation through perceived ease of use, while perceived usefulness and trust are also effective in terms of adoption (Kumar et al., 2020).

3. Methodology

3.1 Universe and sample

In order to determine the mediating effect of the factors that determine mobile banking usage, the data has been collected randomly from the students studying at the associate, undergraduate, graduate, and doctorate levels at Ataturk University in Turkey.

It has been calculated that the sample size should be at least 384 with a 5% error margin within 95% confidence limits to represent the population correctly. In this framework, questionnaires have been applied to 550 students, and 500 complete and error-free questionnaires have been analyzed.

3.2 Measure

The Technology Acceptance Model developed by Davis (1989) has been extended and adapted by researchers in many ways. In the data collected from the participants using a face-to-face questionnaire method with a random sampling technique, a scale developed by adapting different sources has been used to determine the relationships between factors.

In this context, the factors that make up the scale structure of the research, the definitions, the variables they have and the scale in which the resources are used are given in Table 1.

Table 1 Scale structure of the research

Factor	Description	Variable	Resource
Perceived Usefulness	The belief that using new technology will improve business performance	PU1, PU2, PU3, PU4, PU5	Davis (1989), Gefen et al. (2003), Lee et al. (2009)
Perceived Ease of Use	The belief that a new technology can be used easily	PEOU1, PEOU2, PEOU3, PEOU4, PEOU5	Davis (1989), Venkatesh et al. (2003), Luarn & Lin (2005)
Trust	The belief that new technology can be used without worry	T1, T2, T3, T4, T5	McKnight et al. (2002), Kim et al. (2009), Chong et al. (2010)
Mobile Banking Usage	The behavior occurs as a result of the desire to use new technology	MBU1, MBU2, MBU3	Sripalawat et al. (2011), Zhou (2011), Teo et al. (2012)

Source: Authors

The factors in Table 1 have been measured through a 5-point Likert scale (i.e., 1 = Strongly disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly agree) to determine the participants' attitudes towards mobile banking usage. The 10 questions in the first part of the questionnaire form measure the demographic characteristics of the participants, whereas the 18 questions in the second part measure their perceptions and attitudes towards the factors discussed in the research.

3.3 Hypotheses

The definitions and hypotheses regarding the variables used in the research are given below:

3.3.1 Trust

Trust is one of the requirements of eliminating uncertainties in the relationships with other people, groups, or social structures in situations involving uncertainty or risk (Okeke & Okpala, 2014). The concept of trust mentioned within the scope of the study is the belief that personal information cannot be seen or shared by others in the use of mobile banking, that system vulnerabilities are eliminated and necessary precautions are taken.

H1a: There is a significant and positive relationship between trust and perceived usefulness.

H1b: There is a significant and positive relationship between trust and perceived ease of use.

H2a: There is a significant and positive relationship between trust and mobile banking usage (for Model I).

H2b: There is a significant and positive relationship between trust and mobile banking usage (for Model II).

3.3.2 Perceived usefulness

Perceived usefulness refers to positive or negative thoughts that individuals have about their performance increases due to using technology, depending on their individual differences (Davis, 1989). The concept of perceived usefulness stated in this study is the belief that stating the advantages of this platform clearly and accurately can increase digital service channel adaption and utilization rates.

H3a: There is a significant and positive relationship between perceived usefulness and mobile banking usage.

3.3.3 Perceived ease of use

Perceived ease of use is the degree to which an individual believes that he/she easily comprehends a technology without showing extra effort (Davis, 1989). Within the scope of the study, this concept is the belief that factors such as simple interfaces, uncomplicated screens, directive warnings and understandable expressions of the platform positively affect the perception of convenience of the user.

H3b: There is a significant and positive relationship between perceived ease of use and mobile banking usage.

3.3.4 Mobile banking usage

Adaption of innovation is a sort of judgment about making the most of technological developments. Accordingly, concepts such as intention, implementation, satisfaction and utilization are considered as a kind of representation of this judgment (Kumar et

al., 2020). In this context, the use of mobile banking is the belief that user experience from this platform is transferred to others with satisfaction and the desire to repeat it positively affects the usage.
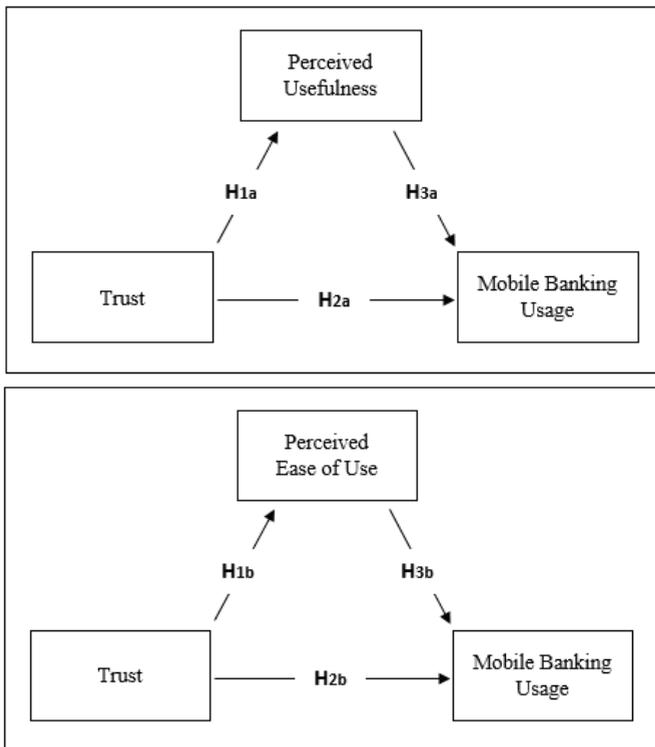
H4a: Perceived usefulness has a mediating role in the relationship between trust and mobile banking usage.

H4b: Perceived ease of use has a mediating role in the relationship between trust and mobile banking usage.

3.4 Research model

The effect of the trust factor as an independent variable on the acceptance and mobile banking usage has been examined by establishing two separate models through the mediating roles of perceived usefulness and perceived ease of use and the hypotheses have been formed accordingly. Since these hypotheses express the effect of mediating factors in the relationship between trust and mobile banking, they are not included in Figure 1.

Figure 1 Research model and hypotheses

Source: Based on the mediation analyses, Process Model 4 (Hayes, 2015)

4. Results

Tables providing descriptive statistics of variables, demographic characteristics of users, mean and standard deviation values of factors, goodness-of-fit values of models, direct, indirect, and total effects of mediating variables, hypotheses, and significance levels of mediating variables were included in the process of analysis. SPSS (Statistical Package for the Social Sciences-v20) and AMOS (Analysis

of Moment Structures-v20) programs have been used for these analyses.

4.1 Analyses and results

4.1.1 Demographic characteristics of the participants

The questions in the first part of the survey and the frequencies and percentages seen according to the demographic characteristics of the participants are given in Table 2.

Table 2 Demographic characteristics of the participants

Demographic Features	Variable	Frequency	Percentage (%)
Gender	Female	238	47.6
	Male	262	52.4
Age	Under 20	93	18.6
	20-25	337	67.4
	26-30	59	11.8
	30+	11	2.2
Marital Status	Married	31	6.2
	Single	465	93.0
	Other	4	0.8
Education	Vocational school	43	8.6
	Faculty	419	83.8
	Master's program	28	5.6
	PhD program	10	2.0
Profession	Student	365	73.0
	Public sector	20	4.0
	Private sector	111	22.2
	Other	4	0.8
Income *(Monthly)**	Under 500 TL	192	38.4
	500-1,000 TL	141	28.2
	1,001-2,000 TL	99	19.8
	2,000+ TL	68	13.6
Channel	Mobile banking	253	50.6
	Phone banking	192	38.4
	Branch banking	39	7.8
	Other	16	3.2
Platform	Computer	40	8.0
	Smart device	438	87.6
	Pad	4	0.8
	Other	18	3.6
Mobile Banking Channel Usage *(Daily)*	Less than 1 hour	446	89.2
	1-3 hours	39	7.8
	3-5 hours	7	1.4
	More than 5 hours	8	1.6
Mobile Banking Channel Usage *(Generally)*	Less than 1 year	175	35.0
	1-3 years	204	40.8
	3-5 years	80	16.0
	More than 5 years	41	8.2

* Note: During the data collection period, the average EUR-TL exchange rate was 1:5. Income categories:
(500TL = 100EUR, 500-1,000TL = 100-200EUR, 1,001-2,000TL = 201-400EUR, 2,000TL = 400EUR).
Source: Authors

Considering the demographic characteristics, frequency and percentages of the participants, gender distribution is balanced (47.6% female and 52.4% male participants), most of them are between the ages of 20-25 (67.4%), and they do not have an additional job (73%) while studying. It has been found out that the participants generally use digital platforms (50.6%) in their banking transactions and they mostly perform these transactions by means of their mobile phones (87.6%). It has been observed that the participants use digital platforms for less than 1 hour (89.2%) in terms of daily mobile bank-

ing channel usage time and they generally have 1-3 years (40.8%) of experience in terms of general mobile banking channel usage time.

4.1.2 Convergent and discriminant validity statistics

The standardized regression weights of variables in Model I and Model II are given in Table 3. In order to determine the variables to be included in the model according to these variants, the effects of the variables below 0.70 on the general alpha coefficient have been tested by adding to and subtracting from the model.

Table 3 Standardized regression weights (Model I and Model II)

	Trust (T)		Perceived Usefulness (PU)		Perceived Ease of Use (PEOU)			Mobile Banking Usage (MBU)	
	Model I	Model II	Model I		Model II			Model I	Model II
T1	0.71	0.70	PU1	0.75	PEOU1	0.83	MBU1	0.88	0.88
T2	0.85	0.85	PU2	0.81	**PEOU2**	**0.49**	MBU2	0.91	0.91
T3	**0.63**	**0.63**	PU3	0.79	PEOU3	0.84	MBU3	0.90	0.90
T4	0.73	0.72	**PU4**	**0.67**	PEOU4	0.82			
T5	0.79	0.80	PU5	0.77	PEOU5	0.84			

Source: Authors

The overall alpha coefficient of the Trust (T) scale has been found as 0.87. The Cronbach's alpha value will decrease if the T3 variable is deleted. The overall alpha coefficient of the Perceived Usefulness (PU) scale has been found as 0.88. The general alpha value will decrease if the PU4 variable is deleted. The overall alpha coefficient of the Perceived Ease of Use (PEOU) scale has been found as 0.88.

If the PEOU2 variable is deleted, the overall alpha value (0.90), the Composite Reliability (CR) value (0.90), the Average Variance Extracted (AVE) value (0.69), and the square root of the AVE value (0.83) will increase.

The Cronbach alpha reliability coefficient value in Table 4 was used to determine the reliability of the scale used in the study.

Table 4 Construct reliability and validity analysis results

	Cronbach's Alpha > 0.70	Composite Reliability CR > 0.70	Average Variance Extracted AVE > 0.50
Trust (T)	0.87	0.86	0.56
Perceived Usefulness (PU)	0.88	0.87	0.58
Perceived Ease of Use (PEOU)	0.88	0.88	0.60
Mobile Banking Usage (MBU)	0.92	0.92	0.80

Source: Authors

Convergent validity is ensured because the AVE value is more significant than 0.50. The CR value is greater than 0.70, which shows that it is reliable. The construct reliability and validity analysis results are

given in Table 4. Discriminant validity indicates how a given construct differs from other constructs. The Fornell-Larcker criterion was used for discriminant validity. Fornell and Larcker (1981) suggest that the

AVE should be greater than the variance between the construct and other constructs in the model. Table 5 for Model I has three constructs (Trust, Perceived Usefulness and Mobile Banking Usage).

Table 5 Fornell-Larcker criterion for Model I

	Mobile Banking Usage	Perceived Usefulness	Trust
Mobile Banking Usage	**0.89**		
Perceived Usefulness	0.73	**0.76**	
Trust	0.73	0.72	**0.75**

Source: Authors

The Fornell-Larcker criterion compares the square root of AVE values with latent variable correlations. In particular, the square root of each structure's AVE should be greater than its highest correlation with any other construct. When the values in the table are examined, it is seen that the first value in each column from top to bottom is greater than the others. In each row, it is seen that the last value from left to right is greater than the others. At the same time, it is seen that the intersections of these values in the specified directions are arranged on the diagonal from the largest to the smallest thus providing discriminant validity.

Table 6 for Model II has three constructs (Trust, Perceived Ease of Use and Mobile Banking Usage).
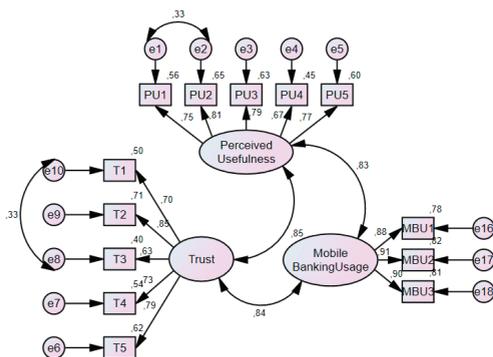
Table 6 Fornell-Larcker criterion for Model II

	Mobile Banking Usage	Perceived Ease of Use	Trust
Mobile Banking Usage	**0.89**		
Perceived Ease of Use	0.77	**0.78**	
Trust	0.73	0.74	**0.75**

Source: Authors

According to the values given in Table 6, it is seen that the square root of the AVE value on the diagonal is greater than the correlation values below the diagonal and the left-hand side of the diagonal, so discriminant validity is provided for Model II.

4.1.3 Confirmatory factor analysis results of Model I

Confirmatory factor analysis used to test the validity of Model I, which examines the perceived usefulness mediating effect on trust in mobile banking usage, is given in Figure 2.

Figure 2 AMOS output confirmatory factor analysis of Model I

Note: PU = Perceived Usefulness, T = Trust, MBU = Mobile Banking Usage
Source: Authors

Appropriate measures of confirmatory factor analysis are shown in Table 7. With a χ2 value (χ2 = 195.14, df: 60 p = 0.000), this ratio is accepted as a goodness-of-fit measure of the model for this cri-terion. Goodness-of-fit indices for the model are shown in Table 7. GFI, AGFI, CFI, NFI, TLI, and RMSEA values are above the acceptable level.

Table 7 Fit indices for confirmatory factor analysis of Model I

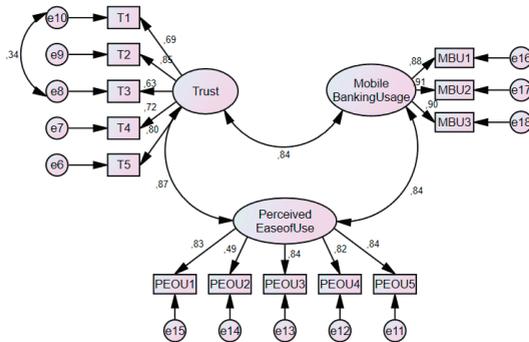| Model	χ²	df	CMIN/ DF ≤ 5	GFI ≥.85	AGFI ≥.80	CFI ≥.90	NFI ≥.90	TLI ≥.90	RMSEA ≤ 0.08
Model I	195.14	60	3.25	0.95	0.92	0.97	0.96	0.96	0.07

Note: AGFI = Adjusted Goodness-of-Fit-Index, CFI = Comparative Fit Index, GFI = Goodness-of-Fit Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, TLI= Tucker-Levis Index
Source: Based on the goodness-of-fit values (Schermelleh-Engel et al., 2003)

4.1.4 Confirmatory factor analysis results of Model II

Confirmatory factor analysis used to test the validity of Model II, which examines the perceived ease of use mediating effect on trust in mobile banking usage, is given in Figure 3.

Figure 3 AMOS output confirmatory factor analysis of Model II

Note: PEOU = Perceived Ease of Use, T = Trust, MBU = Mobile Banking Usage
Source: Authors

Appropriate measures of confirmatory factor analysis are shown in Table 8. With a χ2 value (χ2 = 225.03, df: 61 p = 0.000), this ratio is accepted as a goodness-of-fit measure of the model for this cri-terion. Goodness-of-fit indices for the model are shown in Table 8. GFI, AGFI, CFI, NFI, TLI, and RMSEA values are above the acceptable level.

Table 8 Fit indices for confirmatory factor analysis of Model II

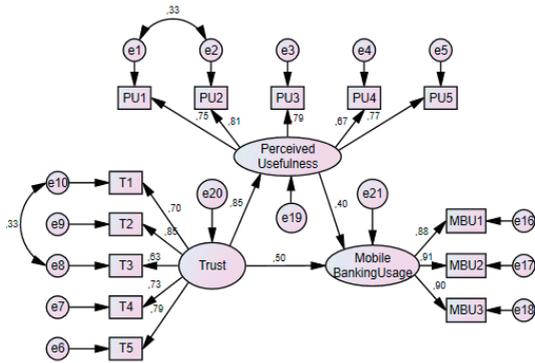| Model	χ²	df	CMIN/ DF ≤ 5	GFI ≥.85	AGFI ≥.80	CFI ≥.90	NFI ≥.90	TLI ≥.90	RMSEA ≤ 0.08
Model II	225.03	61	3.69	0.94	0.91	0.97	0.95	0.96	0.07

Note: AGFI = Adjusted Goodness-of-Fit-Index, CFI = Comparative Fit Index, GFI = Goodness-of-Fit Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, TLI = Tucker-Levis Index
Source: Based on the goodness-of-fit values (Schermelleh-Engel et al., 2003)

4.3 Research model

The AMOS output of the structural equation model of Model I, which examines the perceived useful-ness mediating effect of trust in mobile banking us-age, is given in Figure 4.

Figure 4 Research model for mediating effect of perceived usefulness (Model I)

Note: PU = Perceived Usefulness, T = Trust, MBU = Mobile Banking Usage
Source: Authors

The goodness-of-fit values of Model I, in which the mediating effect of perceived usefulness is exam- ined, can be found in Table 9.
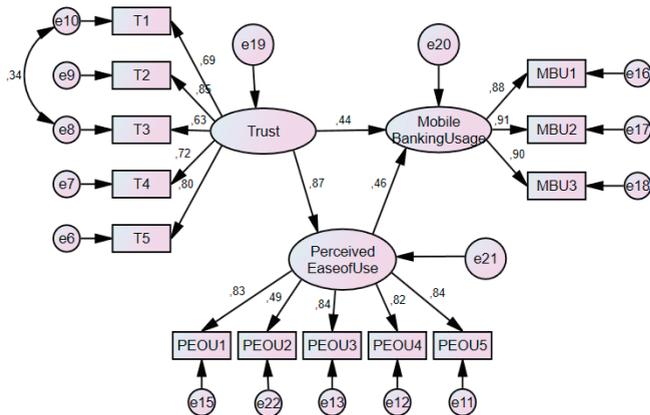
Table 9 Goodness-of-fit values of Model I

Variable	χ^2	df	CMIN/ DF ≤ 5	GFI ≥.85	AGFI ≥.80	CFI ≥.90	NFI ≥.90	TLI ≥.90	RMSEA ≤ 0.08
Model I	195.14	60	3.25	0.95	0.92	0.97	0.96	0.96	0.07

Note: AGFI = Adjusted Goodness-of-Fit-Index, CFI = Comparative Fit Index, GFI = Goodness-of-Fit Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, TLI = Tucker-Levis Index
Source: Based on the goodness-of-fit values (Schermelleh-Engel et al., 2003)

The AMOS output of the structural equation model of Model II, which examines perceived ease of use mediating effect of trust in mobile banking usage, is given in Figure 5.

Figure 5 Research model mediating effect of perceived ease of use (Model II)

Note: PEOU = Perceived Ease of Use, T = Trust, MBU = Mobile Banking Usage
Source: Authors

The goodness-of-fit values of Model II, in which the mediated effect of perceived ease of use is examined, can be found in Table 10.

Table 10 Goodness-of-fit values of Model II

Variable	χ^2	df	CMIN/ DF ≤ 5	GFI ≥.85	AGFI ≥.80	CFI ≥.90	NFI ≥.90	TLI ≥.90	RMSEA ≤ 0.8
Model II	225.03	61	3.69	0.94	0.91	0.97	0.95	0.96	0.07

Note: AGFI = Adjusted Goodness-of-Fit-Index, CFI = Comparative Fit Index, GFI = Goodness-of-Fit Index, NFI = Normed Fit Index, RMSEA = Root Mean Square Error of Approximation, TLI = Tucker-Levis Index
Source: Based on the goodness-of-fit values (Schermelleh-Engel et al., 2003)

The measure of the goodness-of-fit has been examined to see how well the predetermined research model explained the data obtained in the structural equation model. When the goodness-of-fit measures of Model I in Table 9 have been examined, it is seen that the values of χ2 /df, GFI, AGFI, CFI, NFI, TLI and RMSEA are among the recommended acceptable fit values. Likewise, when the goodness-of-fit measures of Model II in Table 10 have been examined, it is seen that the values of χ2 /df, GFI, AGFI, CFI, NFI, TLI and RMSEA are among the recommended acceptable fit values.

Structural relations of the models, standard and non-standard loads, standard error, t-value (critical ratio), p-value and hypothesis results are shown in Table 11.

Table 11 Evaluation of hypotheses

Structural Relations of Model		Non-Standard Loads	Standard Loads (sl)	Standard Error (se)	Critical Ratio (t)	P Value	Decision
Model I	**H1a:** PU <– T	0.89	0.85	0.06	15.18	0.000*	*Accepted*
	H2a: MBU <– T	0.59	**0.50**	0.10	6.25	0.000*	*Accepted*
	H3a: MBU <– PU	0.46	0.40	0.09	5.025	0.000*	*Accepted*
Model II	**H1b:** PEOU <– T	0.98	0.87	0.06	17.81	0.000*	*Accepted*
	H2b: MBU <– T	0.52	**0.44**	0.10	5.38	0.000*	*Accepted*
	H3b: MBU <–PEOU	0.48	0.46	0.09	5.62	0.000*	*Accepted*

*p < 0.001
Source: Authors

When p- and t- values given in Table 11 are evaluated, H1a, H1b, H2a, H2b, H3a and H3b are accepted at a 0.05 significance level. The results of factor relationships, mediated and direct effects, the indirect effect and the mediating level in the models are given in Table 12.

Table 12 Significance level of the mediator variable

Model	Relation	Direct Effect	Mediated Direct	Indirect Effect
Model I	H4a: T-PU-MBU	0.84 (0.000)*	0.50 (0.000)*	0.34
Model II	H4b: T-PEOU-MBU	0.84 (0.000)*	0.44 (0.000)*	0.40

* Two-Tailed Significance (BC)
Source: Authors

According to the data in Table 12, H4a and H4b are accepted at a 0.05 significance level. When the values in Table 12 are examined, it is seen that trust has a direct effect on mobile banking usage (r = 0.84; p = 0.000).

For Model I, the direct effect is 0.84, the mediated direct effect is 0.50, and the indirect effect is 0.34 in terms of the relationship between trust and mobile banking usage. By including perceived usefulness as a mediating variable in this relationship, a decrease in the effect shows that there is a partial mediating effect.

Similarly, for Model II, the direct effect is 0.84, the mediated direct effect is 0.44, and the indirect effect is 0.40 in terms of the relationship between trust and mobile banking usage. By including perceived ease of use as a mediating variable in this relationship, a decrease in the effect indicates a partial mediating effect.

5. Discussion

This study aims to shed light on the effect of trust in mobile banking use on perceived usefulness and ease of use tool variables for university students.

The study results are compatible with many studies in the field of adaptation and use of digital banking channels. The first hypothesis shows that increased confidence in mobile banking use increases perceived usefulness and ease of use. With this result, H1a and H1b hypotheses are accepted and studies in this context are supported in the literature (Davis, 1989).

The findings of the second hypothesis reveal that an increase in trust in mobile banking increases the usage rate. With this result, H2a and H2b hypotheses are accepted and studies in this context are supported in the literature (Riquelme & Rios, 2010).

The findings of the third hypothesis shows that usefulness and ease of use of mobile banking increased its usage. With this result, H3a and H3b hypotheses are accepted and studies in this context are supported in the literature (Kabakuş & Küçükoğlu, 2019b).

The findings related to the fourth hypothesis reveal that these factors have a mediating effect since perceived usefulness and perceived ease of use as mediating variables reduce the effect of trust on mobile banking use. With this result, H4a and H4b hypotheses are accepted and studies in this context are supported in the literature (Luarn & Lin, 2005).

When the findings related to the hypotheses are examined, it is revealed that the feeling of trust that university students have while using mobile banking, which is one of the digital banking platforms, has a direct and an indirect effect on the usage. In parallel with most studies in the literature, it has been seen that trust, which is used as an independent variable, is a direct and highly influential factor in the use of mobile banking, as in the use of any digital tool. It is seen that perceived usefulness and perceived ease of use used as a mediating factor in this study also directly and indirectly affect the use both as a fully independent and mediating variable in the literature.

It has been observed that the factors of perceived usefulness and perceived ease of use used in the study cause a decrease in the severity of the relationship between trust and mobile banking usage as a mediator variable. To put it more clearly, trust in the use of mobile banking increases the perception of usefulness and usability, and it has been revealed that these factors play a partial mediating role in the relationship between trust and mobile banking use.

In this context, the study sample has been collected from 550 students enrolled in different degree programs (vocational school, faculty, Master's program, PhD program) at a state university. The data obtained from university students who are considered more suitable in terms of criteria, such as the number of active mobile banking users, age range, education level, technology literacy, digital adaptation, predisposition, perception level, and so on, have been analyzed by using SEM. In addition, instead of modeling, in which the effect of full independent variables on the dependent variable is examined directly, the mediating effects of two different mediating variables on the dependent variable have been examined through two separate models. In this respect, it is aimed to bring a different perspective than most of the studies in this context in the literature.

6. Conclusion

The transformations brought about by digitalization are closely related to the banking sector and therefore to us as end-users. In addition to being fast and practical, they enable customizability, usability, accessibility, portability, inexpensiveness, variety of operations, and so on. Thanks to their advantages, digital banking channels can offer a more positive banking experience than their alternative ones. In addition to these advantages, disadvantages such as system problems, connection require-

ment, update requirement, complexity, difficulty of use, a purely virtual environment, and security vulnerabilities, can negatively affect user preferences.

Taking all these issues into account, researching the factors that push users to use digital banking channels is an increasingly important field of study. In this context, the effect of trust in the use of mobile banking has been examined through the variables of perceived usefulness and perceived ease of use. The results reveal that for individuals, especially university students, who have a dynamic digital environment, trust plays a critical role in preferring these platforms, and considering these platforms as handy and useful has a positive effect on their use.

The experimental results of the study provide an important reference for future studies so that the models can be adapted and validated in developing countries like Turkey. Moreover, the proposed models can help to understand user trends not only for banks but also for all stakeholders providing services through the mobile platform. In this respect, it is believed that the findings of this study will contribute to the literature academically and industrially.

7. Limitations and future directions

The study has some limitations. The data were collected only from certain users, such as university students, in a limited region. Therefore, collecting data on other profiles belonging to different age groups, occupations and cultures may be helpful in order to generalize the findings. In addition, by applying the prepared survey study to channels other than mobile banking, it may be possible to make more comprehensive predictions about the development and future of the banking sector. Finally, it is thought that the results obtained with different analysis tools and approaches to be used in the theoretical and practical applications of the defended view can contribute to the literature in many more areas and be useful for reference to future studies.

References

1. Al-Sharafi, M. A., Arshah, R. A., Abo-Shanab, E. A. & Elayah, N. (2016). The Effect of Security and Privacy Perceptions on Customers' Trust to Accept Internet Banking Services: An Extension of TAM. *Journal of Engineering and Applied Sciences, 11*(3), 545-552.

2. Al-Sharafi, M. A., Arshah, R. A., Herzallah, F. A. T. & Alajmi, Q. (2017). The Effect of Perceived Ease of Use and Usefulness on Customers Intention to Use Online Banking Services: The Mediating Role of Perceived Trust. *International Journal of Innovative Computing*, 7(1), 9-14.

3. Alkan, Ö., Küçükoğlu, H. & Tutar, G. (2021). Modeling of the Factors Affecting E-Commerce Use in Turkey by Categorical Data Analysis. *International Journal of Advanced Computer Science and Applications, 12*(1), 1-11. https://doi.org/10.14569/IJACSA.2021.0120113

4. Boonsiritomachai, W. & Pitchayadejanant, K. (2019). Determinants Affecting Mobile Banking Adoption by Generation Y Based on The Unified Theory of Acceptance and Use of Technology Model Modified by the Technology Acceptance Model Concept. *Kasetsart Journal of Social Sciences, 40*(2), 349-358.

5. Cheah, C. M., Teo, A. C., Sim, J. J., Oon, K. H. & Tan, B. I. (2011). Factors Affecting Malaysian Mobile Banking Adoption: An Empirical Analysis. *International Journal of Network and Mobile Technologies, 2*(3), 149-160.

6. Chiu, J. L., Bool, N. C. & Chiu, C. L. (2017). Challenges and Factors Influencing Initial Trust and Behavioral Intention to Use Mobile Banking Services in the Philippines. *Asia Pacific Journal of Innovation and Entrepreneurship, 11*(2), 246-278. https://doi.org/10.1108/APJIE-08-2017-029

7. Chong, A. Y. L. Keng-Boon, O., Binshan, L. & Boon-In, T. (2010). Online Banking Adoption: An Empirical Analysis. *International Journal of Bank Marketing, 28*(4), 267-287. https://doi.org/10.1108/02652321011054963

8. Çelik, A. K. & Kabakuş, A. K. (2015). Do E-government Services 'Really' Make Life Easier? Analyzing Demographic Indicators of Turkish Citizens' E-government Perception Using Ordered Response Models. *Mediterranean Journal of Social Sciences, 6*(1), 185-194. https://doi.org/10.5901/mjss.2015.v6n1p185

9. Davis, F. D. (1985). *A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results* [Unpublished PhD Thesis, Massachusetts Institute of Technology]. Massachusetts Institute of Technology.

10. Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Quarterly, September, 13*(3), 319-340. https://doi.org/10.2307/249008

11. Davis, F., Bagozzi, R. & Warshaw, P. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science, 35*(8), 982-1003. https://doi.org/10.1287/mnsc.35.8.982

12. Dymi, A. (2012). Social Media, Gen Y, Leading Online Banking Interactions. *National Mortgage News, 35*(14), 21.

13. Fornell, C. & Larcker, D. F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research, 18*(3), 382-388. https://doi.org/10.1177/002224378101800313

14. Gefen, D., Karahanna, E. & Straub, D. W. (2003). Trust and TAM in Online Shopping: An Integrated Model. *MIS Quarterly, 27*(1), 51-90. https://doi.org/10.2307/30036519

15. Hajiyev, J. & Chang, C. T. (2017). Gen Y Members' Mobile Banking Adoption Intention and Actual Use in Azerbaijan and Turkey: The Technology Acceptance Model and Social Cognitive Theory Approach. *Journal of Internet Banking and Commerce, 22*(7), 23.

16. Hayes, A. F. (2015). An Index and Test of Linear Moderated Mediation. *Multivariate Behavioral Research, 50*, 1-22. https://doi.org/10.1080/00273171.2014.962683

17. Hussain, M. & Wong, C. (2015). The Online Banking Behavior of Generation Y. In *Proceedings of the XIV International Business and Economy Conference Bangkok.* https://doi.org/10.2139/ssrn.2549898

18. Kabakuş, A. K. & Küçükoğlu, H. (2019a). The Effect of Risk Sharing on the Digitalization Process in Banking Sector. *Hoca Ahmet Yesevi 2. Uluslararası Bilimsel Araştırmalar Kongresi, 6-8 Aralık 2019 Erzurum, Sosyal ve Beşeri Bilimler Tam Metin Kitabı,* 596-613.

19. Kabakuş, A. K. & Küçükoğlu, H. (2019b). Call Center Employees Perceptions of Preferences on Mobile Banking: A Study in Erzurum. *Hoca Ahmet Yesevi 2. Uluslararası Bilimsel Araştırmalar Kongresi, 6-8 Aralık 2019 Erzurum, Sosyal ve Beşeri Bilimler Tam Metin Kitabı,* 614-630.

20. Kesharwani, A. & Singh Bisht, S. (2012). The Impact of Trust and Perceived Risk on Internet Banking Adoption in India: An Extension of Technology Acceptance Model. *International Journal of Bank Marketing*, *30*(4), 303-322. https://doi.org/10.1108/02652321211236923

21. Kim, G., Shin, B. & Lee, H. G. (2009). Understanding Dynamics between Initial Trust and Usage Intentions of Mobile Banking. *Information Systems Journal, 19*(3), 283-311. https://doi.org/10.1111/j.1365-2575.2007.00269.x

22. Kumar, A., Dhingra, S., Batra, V. & Purohit, H. (2020). A Framework of Mobile Banking Adoption in India. *Journal of Open Innovation: Technology, Market and Complexity*, *6*(40), 11-13. https://doi.org/10.3390/joitmc6020040

23. Lee, H. J., Lim, H., Jolly, L. D. & Lee, J. (2009). Consumer Lifestyles and Adoption of High-Technology Products: A Case of South Korea. *Journal of International Consumer Marketing, 21*(2), 153-167. https://doi.org/10.1080/08961530802153854

24. Luarn, P. & Lin, H. H. (2005). Toward an Understanding of the Behavioral Intention to Use Mobile Banking. *Computers in Human Behavior*, *21*(6), 873–891. https://doi.org/10.1016/j.chb.2004.03.003

25. McKnight, D. H., Choudhury, V. & Kacmar, C. (2002). Developing and Validating Trust Measures for E-Commerce: An Integrative Typology. *Information Systems Research*, *13*(3), 334-359. https://doi.org/10.1287/isre.13.3.334.81

26. Okeke, T. & Okpala, C. (2014). Discrete Analysis of Demography and Electronic Banking Usage in Nigeria. *Journal of Internet Banking and Commerce*, *19*(2), 1-14.

27. Olasina, G. (2015). Factors Influencing the Use of M-Banking by Academics: Case Study. *The African Journal of Information Systems*, *7*(4), 54-79.

28. Raza, S. A., Umer, A. & Shah, N. (2017). New Determinants of Ease of Use and Perceived Usefulness for Mobile Banking Adoption. *International Journal of Electronic Customer Relationship Management, 11*(1), 44-60. https://doi.org/10.1504/IJECRM.2017.086751

29. Riquelme, H. E. & Rios, R. E. (2010). The Moderating Effect of Gender in the Adoption of Mobile Banking. *International Journal of Bank Marketing*, *28*(5), 328-341. https://doi.org/10.1108/02652321011064872

30. Ruangkanjanases, A. & Wongprasopchai, S. (2017). Adoption of Mobile Banking Services: An Empirical Examination between Gen Y and Gen Z in Thailand. *Journal of Telecommunication, Electronic and Computer Engineering, 9*(3-5), 197-202.

31. Schermelleh-Engel, K., Moosbrugger, H. & Müller, H. (2003). Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit Measures. *Psychological Research Methods Online, 8*(2), 23-74.

32. Shankar, A. & Datta, B. (2018). Factors Affecting Mobile Payment Adoption Intention: An Indian Perspective. *Global Business Review*, *19*, 72-89. https://doi.org/10.1177/0972150918757870

33. Shanmugam, A., Savarimuthu, M. T. & Chen, T. C. (2014). Factors Affecting Malaysian Behavioral Intention to Use Mobile Banking with Mediating Effects of Attitude. *Academic Research International*, *5*(2), 236-245.

34. Sharma, S. K. (2019). Integrating Cognitive Antecedents into TAM to Explain Mobile Banking Behavioral Intention: A SEM-Neural Network Modeling. *Information Systems Frontiers, 21*(4), 815-827. https://doi.org/10.1007/s10796-017-9775-x

35. Slade, E. L., Williams, M. D. & Dwivedi, Y. K. (2014). Devising a Research Model to Examine the Adoption of Mobile Payments: An Extension of UTAUT2. *The Marketing Review,* 310-335. https://doi.org/10.1362/146934714X14024779062036

36. Sripalawat, J., Thongmak, M. & Ngramyarn, A. (2011). M-Banking in Metropolitan Bangkok and a Comparison with Other Countries. *Journal of Computer Information Systems, 51*(3), 67-76.

37. Suh, B., & Han, I. (2002). Effect of Trust on Customer Acceptance of Internet Banking. *Electronic Commerce Research and Applications, 1*(3-4), 247-263. https://doi.org/10.1016/S1567-4223(02)00017-0

38. Tan, E., Lau, J. L. & Young, B. (2016). Behavioral Intention to Adopt Mobile Banking Among the Millennial Generation. *Young Consumers*, *17*(1), 18-31. https://doi.org/10.1108/YC-07-2015-00537

39. Teo, A. C., Tan, G. W. H., Cheah, C. M., Ooi, K. B. & Yew, K. T. (2012). Can The Demographic and Subjective Norms Influence the Adoption of Mobile Banking? *International Journal of Mobile Communications*, *10*(6), 578-597. https://doi.org/10.1504/IJMC.2012.049757

40. Thakur, R. (2014). What Keeps Mobile Banking Customers Loyal? *International Journal of Bank Marketing*, *32*(7), 628-646. https://doi.org/10.1108/IJBM-07-2013-0062

41. Venkatesh, V., Morris M. G. & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, *27*(3), 425-478. https://doi.org/10.2307/30036540

42. Zalloum, L., Alghadeer, H. & Nusairat, N. (2019). The Effect of Using Mobile Banking Services Applications on Electronic Word of Mouth: The Mediating Role of Perceived Trust. *International Business Research*, *12*(9), 62-75. https://doi.org/10.5539/ibr.v12n9p62

43. Zhou, T. (2011). An Empirical Examination of Initial Trust in Mobile Banking. *Internet Research*, *21*(5), 527-540. https://doi.org/10.1108/10662241111176353