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Digital Banking in Turkiye

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Abstract: Digital banking has become a critical component of financial systems worldwide; however, adoption rates remain uneven across emerging markets. This study aims to identify the key barriers to digital banking adoption in Türkiye. This study employs a quantitative research design using survey data collected from 471 bank customers in Türkiye. Factor analysis, reliability analysis, and ANOVA tests were conducted to identify the primary barriers and demographic effects influencing digital banking adoption. The results reveal that digital banking adoption barriers are primarily explained by two main factors: lack of trust and lack of knowledge. Furthermore, digital banking usage increases significantly among individuals with higher education levels, higher income levels, and younger age groups. This study provides empirical evidence on digital banking adoption barriers in an emerging market context and contributes to fintech adoption literature.

Keywords: Digital Banking; Emerging Markets; Fintech Adoption; Türkiye; Financial Technology; Banking Behavior

1. Introduction

Digital banking represents one of the most significant technological transformations in the financial services industry. Through mobile banking, internet banking, and automated digital channels, customers can access financial services efficiently without visiting physical branches. While digital banking adoption has reached high levels in developed economies, adoption remains relatively low in many emerging markets, including Türkiye.

Emerging markets often face structural challenges such as lower digital literacy, infrastructure limitations, and higher levels of trust sensitivity. Türkiye represents an important case study due to its rapidly developing banking sector, strong technological infrastructure, and large customer base.

In recent years, digital banking has transformed the global financial landscape, offering customers greater convenience, enhanced security, and wider access to financial services. Despite its rapid adoption worldwide, Türkiye exhibits comparatively lower digital banking usage rates than many developed

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economies. According to recent surveys, a significant proportion of Turkish consumers still prefer traditional banking methods over digital platforms, highlighting a notable digital divide within the country. **Table 1** presents the percentage of individuals using internet banking in Turkey and the European Union. Although Türkiye has experienced rapid growth in recent years, its digital banking usage rates are still well below the EU average.

Table 1. Individuals using the internet for internet banking (%)

TIME	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
European Union - 27 countries (from 2020)	42,29	43,82	46,27	48,88	51,43	54,57	57,69	58,31	59,63	63,87	67,24	69,66
Belgium	61,24	62,28	64,48	66,63	68,74	71,18	75,30	75,26	79,51	79,60	83,34	79,30
Bulgaria	4,70	5,35	4,40	5,49	7,37	8,57	12,57	14,87	22,44	23,43	31,33	31,08
Czechia	46,05	48,44	51,36	56,55	62,42	67,96	69,66	72,78	77,09	79,84	83,57	84,87
Denmark	84,28	84,89	87,86	89,77	89,47	90,78	94,32	94,59	94,35	96,22	97,76	97,61
Germany	48,76	50,98	52,97	55,56	58,84	61,10	64,91	50,35	48,58	57,22	66,92	70,71
Estonia	76,56	80,67	78,59	79,23	80,36	80,72	79,84	81,51	83,36	84,89	83,39	87,33
Ireland	48,11	51,47	52,34	57,64	57,67	67,39	68,99	76,87	82,87	83,77	86,71	95,17
Greece	13,14	13,87	19,16	25,12	27,28	30,51	36,55	42,40	49,78	52,01	54,15	63,02
Spain	37,42	39,37	43,15	46,18	48,66	54,88	62,10	65,16	69,60	71,45	74,96	74,77
France	57,60	58,28	59,36	62,01	63,48	65,55	:	71,60	67,86	72,41	71,88	78,33
Croatia	19,14	32,90	38,33	33,30	40,74	46,46	50,15	55,53	57,96	61,88	61,52	65,81
Italy	26,07	28,06	28,96	30,83	33,83	36,31	39,45	45,15	48,35	51,55	55,01	56,37
Cyprus	24,20	20,47	27,72	27,59	33,28	40,54	52,12	64,71	63,94	70,86	80,54	78,10
Latvia	56,76	64,32	62,08	61,19	66,33	71,58	76,40	80,23	82,45	83,74	84,95	86,04
Lithuania	53,57	50,16	54,20	56,19	60,62	64,73	67,60	72,39	74,82	75,73	79,63	79,28
Luxembourg	66,51	65,10	70,91	76,42	67,67	70,60	70,63	71,76	69,96	71,14	76,06	74,41
Hungary	30,52	33,80	35,26	37,70	41,27	46,70	51,31	55,98	61,04	65,52	66,85	69,17
Malta	44,98	47,49	47,03	50,01	50,91	53,88	60,32	62,82	66,32	67,38	73,90	76,37
Netherlands	83,43	84,53	84,69	88,91	88,94	90,63	89,41	90,76	90,72	95,13	96,35	95,55
Austria	47,95	51,03	53,34	57,49	58,41	62,78	65,79	71,31	73,13	77,17	78,24	79,04
Poland	32,59	31,20	39,11	39,77	44,01	47,27	49,49	52,24	55,55	59,09	56,75	58,17
Portugal	25,27	28,22	28,87	31,29	38,55	41,95	47,06	52,83	57,45	58,88	63,49	65,24
Romania	4,16	5,34	5,06	6,83	6,87	8,36	11,65	15,49	19,19	21,89	27,72	30,97
Slovenia	32,28	33,66	35,22	39,05	41,92	47,13	51,80	57,13	56,86	60,69	63,97	65,61
Slovakia	40,59	37,27	45,37	51,11	49,80	54,77	58,20	57,89	48,08	57,72	57,99	60,52
Finland	85,61	85,68	86,41	87,41	88,71	90,72	92,18	93,26	94,68	94,48	94,99	95,51
Sweden	81,66	79,64	83,19	86,47	83,86	84,47	84,69	83,50	83,50	84,49	83,07	81,98
Iceland	91,40	:	:	93,02	94,29	94,26	95,93	94,87	:	:	:	:
Liechtenstein	:	:	:	:	:	:	:	:	:	:	:	:
Norway	89,23	90,37	91,23	92,34	93,12	95,23	93,68	96,13	95,84	96,85	96,80	95,69
Switzerland	54,29	:	:	66,05	:	72,84	:	77,44	:	83,80	:	85,71
United Kingdom	56,85	58,38	64,16	68,35	73,88	77,70	80,41	:	:	:	:	:
Montenegro	:	:	:	3,84	1,89	3,16	7,40	8,09	11,35	13,46	16,14	18,01
North Macedonia	8,52	4,92	8,66	8,15	9,46	14,88	15,28	26,95	:	:	36,70	34,49
Albania	:	:	:	:	1,55	1,69	3,92	5,24	10,86	15,10	18,53	:
Serbia	:	8,44	:	15,94	14,93	17,85	17,08	20,75	24,84	31,82	36,11	37,46
Türkiye	13,66	15,04	18,10	22,93	28,08	34,84	39,42	46,00	51,18	57,66	61,95	65,74
Bosnia and Herzegovina	:	:	:	:	4,90	5,45	12,26	12,82	:	19,93	27,34	35,86
Kosovo*	:	:	:	3,62	1,50	5,42	8,90	:	:	:	27,90	:

Source: (https://ec.europa.eu/eurostat/databrowser/view/tin00099/default/table?lang =en)

Several factors may contribute to this phenomenon, including technological infrastructure limitations, digital literacy levels, security concerns, and cultural attitudes toward financial transactions. Understanding the barriers to digital banking adoption in emerging markets is critical for financial institutions and policymakers. This study aims to identify the key barriers to digital banking adoption in Türkiye and provide empirical evidence using factor analysis and statistical methods.

2. Literature Review

The adoption of digital banking has been widely studied within the framework of technology acceptance theory, trust theory, and fintech adoption models. Prior research indicates that perceived usefulness, ease of use, trust, and digital literacy are primary determinants of adoption.

Technology acceptance theory (Davis, 1989) and trust theory (Gefen et al., 2003) suggest that trust, perceived usefulness, and knowledge are critical determinants of digital technology adoption. Emerging markets face additional structural barriers such as lower digital literacy and higher trust sensitivity. Prior research has identified trust, usability, and perceived usefulness as key determinants of digital banking adoption (Davis, 1989; Oliveira et al., 2014). Trust plays a particularly important role in emerging markets due to institutional and behavioral factors (Gefen et al., 2003).

Studies show that customers in emerging markets demonstrate higher resistance to digital banking due to security concerns and lack of knowledge (Shaikh and Karjaluoto, 2015). Additionally, demographic factors such as age, income, and education significantly influence adoption behavior (Alalwan et al., 2017). Recent emerging market studies emphasize the importance of financial literacy and trust-building strategies to increase adoption rates (Tam and Oliveira, 2016).

In recent years, numerous studies have examined digital banking applications. There are many studies

in the literature examining digital banking and its economic dimensions (Shaikh and Karjaluoto, 2015; Petrova and Kuznetsova, 2020).

When previous studies examining the current situation are reviewed, it can be seen that Demirel (2017) examined the regulations in the USA and the EU and touched upon the practices. In addition, the benefits and harms of digital banking were revealed by examining examples of digital banking applications in Türkiye. The findings show that digital banking will play an important role in competition, that banks that want to be leaders in the sector should focus on digital banking applications, and that improvements in internet infrastructure will contribute to the spread of digital banking. Similarly, Zeybek (2018) considered the advantages of digital banking and its applications in Türkiye, using bank activity reports. Researchers note that digital banking reduces costs and provides advantages in many areas. They also state that banks should implement technology that ensures the security of customer data.

Kaur and colleagues (2021) examined the impact of certain activities conducted in bank branches on encouraging customers to adopt digital banking. Interviews were conducted with senior executives of banks in India. Content analysis was used as the method in the study. Researchers show that positive communication with customers, branch digital infrastructure and customer-centric approaches are the key elements supporting digital banking. Bulut and Çizgici Akyüz (2020) considered banks' potential strategies against financial technological developments and emphasized that banks should develop their internet-based service structure in order to maintain their competitiveness and review their existing data processing methods within the framework of valid data protection rules. Demirhan (2021) investigated the current level of digitalization in Türkiye and the effects of digitalization on traditional bank branches.

Some researchers have examined the changes in digital banking due to the Covid-19 pandemic. (Beybur and Çetinkaya, 2020; Uzun, 2021; Nguyen, Kim-Duc, and Freiburghaus, 2022; Schmidt-Jessa, 2023). In their study, Beybur and Çetinkaya (2020) stated that Covid-19 has greatly affected the banking sector, which is one of the sectors where money exchange takes place and face-to-face communication is most intense. It was noted that there was a huge increase in the number of customers using digital channels and in loans provided through digital channels in the banking sector, particularly in June 2020, which coincided with the early stages of the pandemic. Uzun (2021) noted in his study that the Covid-19 pandemic significantly impacted customers' use of digital banking, and that digital banking will become even more widespread in the future if banks closely monitor technological developments, update their systems, and provide higher-quality services.

It is also possible to come across studies in the literature that examine the digital literacy level of customers (Terzi and İşli, 2020; Esen, 2020) and customer experience in digital banking (Chauhan et al., 2022). Mbama et al. (2018) investigated the impact of digitalization on customer experience and financial performance of banks. The study used a survey to gather the views of senior executives at the Bank of England on the impact of digital banking on customer experience and financial performance. The study concluded that customer experience and satisfaction affect financial performance. Garepasha et al. (2021) examined the impact of service quality on customer loyalty in online banking services. A face-to-face survey was administered to 651 digital banking customers. Noyan and Gavcar (2020) aimed to determine the factors affecting customer satisfaction in the use of digital banking products. In this context, a survey was administered to 170 individuals and indicated that trust is an important criterion in ensuring customer satisfaction.

When we look at the studies in the literature on the factors affecting digital banking usage rates, it is seen that ease of use is the most important factor affecting digital banking use. Ozkan and Ipekten (2017) investigated the factors influencing internet banking use. The universal cluster in the research consists of academicians and administrative staff working at Atatürk University (Türkiye). They developed 6 hypotheses to determine whether there is a relationship between internet banking usage and demographic factors. Accordingly, it was investigated whether there was a relationship between internet banking usage and marital status, age, gender, education level, profession and income; it was concluded that age, education level, profession and income are factors affecting internet

banking usage. Bayrakdaroğlu (2012) conducted a survey for the same purpose and as a result of the study, it was revealed that privacy, security, innovation, computer usage proficiency, social environment and internet connection quality affect the use of internet banking.

Digital banking has transformed the financial landscape, significantly influencing how consumers manage their finances. Research shows a rapid increase in the use of digital banking due to advancements in technology, diversifying consumer preferences and the global shift towards online services. Industry commentary also indicates that the COVID-19 period accelerated banks' investment in digital channels and digital operating models (Jerenz, 2022). From a similar perspective Çon and Arıca (2024) examined how digital banking has evolved in Türkiye in light of innovations and global trends. Beyoğlu (2025) researched the relationship between efficiency and digitalization in the Turkish banking sector and the impact of banks' digitalization capabilities on efficiency.

The factors influencing digital banking adoption have been examined in numerous studies. A study by Ayo et al. (2016) highlights that ease of use and perceived benefits are the most important determinants of technology acceptance in digital banking. Furthermore, digital banking usage rates vary significantly across different regions and demographics. Deloitte (2020) documents the broader acceleration of organizational digitization during the COVID-19 period, although differences in access and digital literacy remain relevant considerations for digital financial inclusion. The gender gap in digital banking usage is another area of focus, with studies revealing that women are generally less likely to use digital banking services compared to men, often due to concerns about security and privacy (Mpofu, 2023).

Overall, the literature indicates a positive trajectory for digital banking adoption, influenced by a blend of technological, social, and economic factors. More research is needed to investigate the future impacts of digital banking on consumer behavior and the financial sector. The literature can be classified according to various perspectives in **Table 2**, in accordance with their basic characteristics.

Table 2. Literature Summary

Classification	References			
Studies explaining digital banking	Shaikh and Karjaluoto (2016)	Petrova and Kuznetsova (2020)		
Current situation analysis studies	Demirel (2017)	Zeybek (2018)	Çon and Arıca (2024)	
Studies examining the effects of digitalization on the banking sector	Kaur et al. (2021)	Bulut and Çizgici Akyüz (2020)	Demirhan (2021)	Beyoğlu (2025)
Studies examining the impact of Covid-19 on digital banking use	Beybur and Çetinkaya (2020)	Uzun (2021)	Nguyen et al. (2022)	
Studies examining customer digital literacy levels	Terzi and İşli (2020)	Esen (2020)		
Studies on customer experience	Mbama et al. (2018)	Garepasha et al. (2021)	Noyan and Gavcar (2020)	Chauhan et al., (2022)
Studies on factors affecting digital banking usage	Bayrakdaroğlu (2012)	Ozkan and Ipekten (2017)	Kaplan and Korkmaz (2020)	

Türkiye provides an ideal emerging market context due to its rapidly growing fintech ecosystem and strong banking infrastructure. This study contributes to the literature by providing empirical evidence from Türkiye and identifying key structural barriers within an emerging market context. It is also considered that the findings obtained from this study may provide guidance for banks trying to increase digital banking usage rates.

3. Methodology

The banking sector is one of the sectors where digital technologies are used most intensively. When TBB data is examined, it is seen that digital banking usage rates in Türkiye are lower than the usage rates of other countries. The views of people working in the banking sector in Türkiye are in the same direction.

This study aims to identify the reasons behind the

low digital banking usage rates in Türkiye. In this way, it will be possible to make inferences about the measures that banks operating in our country should take to increase digital channel usage rates.

As a result of the literature research, no study was found regarding the reasons for the low digital banking usage rates in Türkiye. In this respect, the study is expected to make significant contributions to the banking sector and literature. It is also expected to provide guidance regarding the measures that banks should take, especially as they try to direct their customers to digital channels more and more every day, especially due to pandemic conditions.

3.1. Determination of Sample Size

It is stated that the sample size should be 278 in a universe of 1000 people, where the confidence level is accepted as 95% and the margin of error is 5% (Kurtuluş, 1998). Equation (1) was used to calculate the sample size within the scope of the study.

$$n = N.t^2.p.q \,/\, d^2.(N\text{-}1)+t^2.p.q \qquad (1)$$

The explanations of the expressions in Equation (1) are as follows:

n: sample size,

N: total number of members in the population,

t: table value corresponding to the selected confidence level,

p: the proportion of elements with a certain feature in the population,

q: complement of *p*,

d: acceptable error level.

The target population of the study is estimated to be approximately 55 million individuals (customers between the ages of 18-70 who are thought to use digital channels in Türkiye). In many studies," p " and "q" values are not known precisely. Since these two values are not known precisely in this study, the highest value that the "p*q" product can take, 0.25, was used. The sample size calculated with the help of Equation (1) for the 95% confidence level and 5% margin of error, which is generally considered sufficient in research conducted in the field of social sciences, is 385. However, in order to increase the reliability and validity of the study, the sample size was determined as 471.

3.2. Data Collection

In order to collect data, a survey was conducted on 471 people selected by random sampling method among bank customers who prefer to come to different bank branches across Türkiye and carry out their transactions face to face. The questions to be included in the survey were determined as a result of a detailed literature research. Before starting the survey, an application was made to the Nuh Naci Yazgan University ethics committee and approval was received with the number 2022/11046. Then, interviews were held with bank employees and bank branch managers experienced in the field of banking, and the questions to be included in the draft survey form were finalized by brainstorming method. The prepared draft survey form was sent to different branch managers and university faculty members for their opinions, and the survey form was prepared with the feedback received from them. The survey form consists of 2 pages and 16 questions. The first 3 questions were asked to determine the demographic characteristics of the customers. The fourth question is designed to measure how often customers use digital banking. Questions regarding the factors thought to affect customers' use of digital banking are located between 5-16. The validity and reliability of the prepared survey form was tested on a pre-application group of 50 people. As a result of the preliminary application, it was determined that the survey was valid and reliable and that there was no problem in understanding the questions, and then it was applied to the large group.

3.3 Hypothesis Testing

Cronbach-Alpha coefficient is one of the most important indicators used to test the reliability of the scales. In the study, the Cronbach-Alpha value calculated for statements 5-16 included in the scale in order to reveal the reasons why bank customers avoid digital banking was found to be 91.4%. This value means that the reliability of the scale is quite high and the scale can be used safely for future analyses.

Kolmogorov-Smirnov and Shapiro-Wilk tests prove that the data do not show a normal distribution. Although the opinion in the literature is that parametric tests cannot be performed for data that do not show a normal distribution, a group of researchers point out that data transformations in the data set will cause more information loss and state that parametric tests can be performed even if the data do not show a normal

distribution (Norman, 2010). It is stated that if the skewness and kurtosis coefficients calculated for the data are between -1.5 and +1.5, parametric tests can be used even if the data do not show a normal distribution (Tabachnick and Fidell, 2013). Additionally, if the transformation is not suitable for the data or the researcher does not want to transform, non-parametric methods can also be used (Conover and Iman, 1981).

Three hypotheses were tested to examine whether digital banking usage rates vary depending on the variation in customers' ages, education levels and incomes. The hypotheses tested are:

- Hypothesis-1 (Ho): There is no significant difference between digital banking usage rates for different age groups.
- Hypothesis-2 (Ho): There is no significant difference between educational status and digital channel usage rates.
- Hypothesis-3 (Ho): There is no significant difference between income level and digital channel usage rates.

Hypothesis-1: The first question about age in the survey was divided into 4 options to represent the baby boom generation (1946-1964), X Generation (1965-1979), Y Generation (1980-1995) and Z Generation (1996-2010). To test whether there is a significant difference between digital banking usage rates for different age groups, it is necessary to first check whether the variances are distributed homogeneously. Levene Test was applied to investigate whether the variance between different age groups was homogeneous. The results obtained are shown in **Table 3**. As the data in **Table 4** indicate, the Levene test significance level is less than 0.05. This result shows that the variances are not homogeneous. In cases where variances are not distributed homogeneously, it is more appropriate to use Welch and Brown-Forsythe tests instead of ANOVA analysis to test hypotheses. However, for comparison purposes, ANOVA results are given in **Table 4**, and the results of the Welch and Brown-Forsythe tests are given in **Table 5**.

Table 3. Hypothesis-1 Levene Test Results

	Levence Statistic	df1	df2	Sig.
Based on Mean	3,726	3	467	,011
Based on Median	3,284	3	467	,021
Based on Median and with adjusted df	3,284	3	452,631	,021
Based on trimmed mean	3,825	3	467	,010

Table 4. Hypothesis-1 ANOVA Test Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	142,013	3	47,338	33,502	<,001
Within Groups	659,851	467	1,413		
Total	801,864	470			

Table 5. Hypothesis-1 Welch and Brown-Forsythe Test Results

	Statistic[a]	df1	df2	Sig.
Welch	42,380	3	220,312	<,001
Brown-Forsythe	35,719	3	415,626	<,001

[a]Asymptotically F distributed.

Both ANOVA analysis results and Welch and Brown-Forsythe tests show that the H0 hypothesis should be rejected for Hypothesis-1 (Sig. values in **Table 4** and **Table 5** are below 0.05). These results show that the hypothesis "There is no significant difference between digital banking usage rates for different age groups" should be rejected, that is, age is an important factor affecting the digital banking usage rate. Post-hoc tests were applied to determine which of the different age groups had higher digital banking usage rates. Post-hoc test results are shown in **Table 6**. The results in **Table 6** show that the digital banking usage rates of baby

boomers are statistically significantly lower than other age groups. Similarly, digital banking usage rates of Generation X are statistically significantly lower than Generation Y and Z. The difference between the digital banking usage rates of Generation Y and Generation Z is not statistically significant. These results revealed that generations Y and Z use digital banking more than other age groups.

Table 6. Hypothesis-1 Post-hoc Test Results

		Tukey HSD			95% Confidence Interval	
(I) Age?	**(J) Age?**	**Mean Difference (I-J)**	**Std.Error**	**Sig.**	**Lower Bound**	**Upper Bound**
	1965-1979	-,70748*	,17346	<,001	-1,1547	-,2602
1946-1964	1980-1995	-1,56504*	,17057	<,001	-2,0048	-1,1253
	1996-2010	-1,30037*	,18975	<,001	-1,7896	-,8111
	1946-1964	,70748*	,17346	<,001	,2602	1,1547
1965-1979	1980-1995	-,85756*	,13501	<,001	-1,2057	-,5095
	1996-2010	-,59288*	,15855	,001	-1,0017	-,1841
	1946-1964	1,56504*	,17057	<,001	1,1253	2,0048
1980-1995	1965-1979	,85756*	,13501	<,001	,5095	1,2057
	1996-2010	,26467	,15538	,323	-,1359	,6653
	1946-1964	1,30037*	,18975	<,001	,8111	1,7896
1996-2010	1965-1979	,59288*	,15855	,001	,1841	1,0017
	1980-1995	-,26467	,15538	323	-,6653	,1359

Hypothesis-2: The second question regarding educational status in the survey was divided into 5 levels to show the levels of schooling. It was investigated whether the variance between different education levels was homogeneous or not and the results given in **Table 7**. According to the data in **Table 7**, the Levene test significance level is less than 0.05. This result shows that the variances are not homogeneous. Therefore, it would be more appropriate to look at the Welch and Brown-Forsythe test results shown in **Table 9** instead of the ANOVA test results in **Table 8**.

Table 7. Hypothesis-2 Levene Test Results

	Levence Statistic	**df1**	**df2**	**Sig.**
Based on Mean	3,062	4	466	,016
Based on Median	3,005	4	466	,018
Based on Median and with adjusted df	3,005	4	454,847	,018
Based on trimmed mean	3,488	4	466	,008

Table 8. Hypothesis-2 ANOVA Test Results

	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	202,774	4	50,694	39,432	<,001
Within Groups	599,090	466	1,286		
Total	801,864	470			

Table 9. Hypothesis-2 Welch and Brown-Forsythe Test Results

	Statistic[a]	**df1**	**df2**	**Sig.**
Welch	47,605	4	83,383	<,001
Brown-Forsythe	45,338	4	235,232	<,001

[a]Asymptotically F distributed.

According to **Table 9**, the significance level for both Welch and Brown-Forsythe tests is below 0.05. This result reveals that the hypothesis "There is no significant difference between educational status and digital channel usage rates" should be rejected, that is, educational status is an important factor affecting the digital banking usage rate. Post-hoc tests were applied to determine which of the different education levels had higher digital banking usage rates. Post-hoc test results are shown in **Table 10**. According to the data in **Table 10**, there is no significant difference in digital channel usage rates between customers with postgraduate education and customers with high school and secondary school education, while the difference between customers with other education levels is significant. Looking at these results, it is possible to infer that the use of digital channels increases as the level of education increases.

Table 10. Hypothesis-2 Post-hoc test results

		Tukey HSD			95% Confidence Interval	
(I) Educational status?	**(J) Educational status?**	**Mean Difference (I-J)**	**Std.Error**	**Sig.**	**Lower Bound**	**Upper Bound**
Primary school	Primary school	-,72879*	,18983	,001	-1,2486	-,2089
	Middle school	-,95119*	,17053	<,001	-1,4182	-,4842
	High school	-1,90851*	,17477	<,001	-2,3871	-1,4299
	University	-2,36190*	,33653	<,001	-3,2835	-1,4403
	Postgraduate	,72879*	,18983	,001	,2089	1,2486
Middle school	Primary school	-,22240	,14920	,569	-,6310	,1862
	Middle school	-1,17972*	,15404	<,001	-1,6015	-,7579
	High school	-1,63312*	,32625	<,001	-2,5265	-,7397
	University	,95119*	,17053	<,001	,4842	1,4182
	Postgraduate	,22240	,14920	,569	-,1862	,6310
High school	Primary school	-,95732*	,12950	<,001	-1,3120	-,6027
	Middle school	-1,41071*	,31541	<,001	-2,2745	-,5470
	High school	1,90851*	,17477	<,001	1,4299	2,3871
	University	1,17972*	,15404	<,001	,7579	1,6015
	Postgraduate	,95732*	,12950	<,001	,6027	1,3120
University	Primary school	-,45339	,31772	,610	-1,3235	,4167
	Middle school	2,36190*	,33653	<,001	1,4403	3,2835
	High school	1,63312*	,32625	<,001	,7397	2,5265
	University	1,41071*	,31541	<,001	,5470	2,2745
	Postgraduate	,45339	,31772	,610	-,4167	1,3235
Postgraduate						

Hypothesis-3: The third question regarding income status in the survey was divided into 3 options to represent low income (0 - 3049 TL), middle income (3050 TL - 9931 TL) and high-income groups (9932 TL and above). It was investigated whether the variance between different income levels was homogeneous or not and the results shown in **Table 11** were obtained. As **Table 11** says, the Levene test significance level was higher than 0.05, so the variances were found to be homogeneous. Therefore, applying the Anova test will be sufficient. **Table 12** shows the ANOVA test results.

Table 11. Hypothesis-3 Levene test results

	Levence Statistic	**df1**	**df2**	**Sig.**
Based on Mean	,061	2	468	,941
Based on Median	,016	2	468	,984
Based on Median and with ad adjusted df	,016	2	461,225	,984
Based on trimmed mean	,043	2	468	,958

Table 12. Hypothesis-3 ANOVA test results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	116,439	2	58,220	39,752	<,001
Within Groups	685,425	468	1,465		
Total	801,864	470			

In **Table 12**, it was observed that the Sig.value was less than 0.05 with the ANOVA test. This result says that the hypothesis "There is no significant difference between income level and digital channel usage rates" should be rejected, that is, income level is an important factor affecting the digital banking usage rate.

Post-hoc tests were applied to compare different income levels with others in pairs, and the results are shown in **Table 13**. When the post-hoc test was examined and the 3 income groups were compared, it was found that there was a significant difference between all of them. In other words, as the income level of customers increases, digital banking usage rates also increase.

Table 13. Hypothesis-3 post-hoc test results

		Tukey HSD			95% Confidence Interval	
(I) Income?	**(J) Income?**	**Mean Difference (I-J)**	**Std.Error**	**Sig.**	**Lower Bound**	**Upper Bound**
0-3049 TL	3050-9931 TL	-,84339*	,12802	<,001	-1,1444	-,5424
	≥ 9932 TL	-1,45616*	,17237	<,001	-1,8614	-1,0509
3050-9931 TL	0-3049 TL	,84339*	,12802	<,001	,5424	1,1444
	≥ 9932 TL	-,61276*	,15722	<,001	-,9824	-,2431
≥ 9932 TL	0-3049 TL	1,45616*	,17237	<,001	1,0509	1,8614
	3050-9931 TL	,61276*	,15722	<,001	,2431	,9824

3.4. Factor Analysis

Factor analysis is a multivariate statistical analysis technique that allows obtaining fewer unrelated variables by bringing together variables that are related to each other; in other words, its main purpose is dimension reduction and summarization (Buyukozturk, 2002). In the survey, participants were asked to evaluate 12 statements (statements 5-16) to identify the factors thought to influence people's digital banking usage rates. Factor analysis method was used to reduce the factors that have the potential to affect digital banking usage rates to a smaller number of factors. **Table 14** shows the factor analysis descriptive statistics table.

Table 14. Descriptive statistics table for factor analysis

	Mean	Std. Deviation	Analysis N
I have sufficient knowledge about banking transactions that can be carried out through digital channels.	2,8493	1,38403	471
I find digital banking transactions safe.	2,5287	1,40468	471
I think digital channels make banking transactions easier.	2,9660	1,41681	471
I think digital channels save time in performing banking transactions.	3,0297	1,39267	471
I think digital banking transactions are easy.	2,9002	1,37633	471
In general, I find digital channels useful for banking activities.	3,0658	1,34715	471
I think digital channels reduce costs in banking transactions.	2,6858	1,48000	471
Having a contact person while performing banking transactions gives me confidence.	3,5987	1,26252	471
I can easily access bank branches that provide traditional banking services.	3,7070	1,35393	471
It is important for me to document banking transactions after performing them.	3,5435	1,31024	471
I know how banking activities are carried out through digital channels.	3,0276	1,38583	471
I think the digital banking infrastructure is sufficiently developed in Türkiye.	3,0149	1,22465	471

The Kaiser-Meyer-Olkin (KMO) test is performed to measure whether the sample size is large enough for factor analysis. This test is expected to be greater than 0.6. KMO sample adequacy criterion can take values between 0 and 1. A KMO value less than 0.5 indicates that the sample size is not large enough for factor analysis and that factor analysis will not yield reliable results. Values between 0.6 and 0.7 indicate that the sample size is sufficient, values between 0.7 and 0.8 indicate that it is at a good level, values between 0.8 and 0.9 indicate that it is at a very good level, and values above 0.9 indicate that the sample size is at an excellent level. An examination of the test results shown in **Table 15** reveals that the KMO value is 0.935. This value indicates that the sample size is excellent for factor analysis. Bartlett's test of sphericity reveals whether there is a general relationship between variables. An analysis with a value below 0.05 is considered significant. As a result of the analysis, the Bartlett test is found to be significant and the data is determined to be suitable for factor analysis.

Table 15. KMO and Bartlett test results

Kaiser-Mayer-Olkin Measure of Sampling Adequacy		**,935**
Bartlett's Test of Sphericity	Approx. Chi-Square	3858,323
	df	36
	Sig.	,000

Table 16 shows the amount of variance explained by the factors resulting from the factor analysis at baseline and after rotation. The analysis shows that all components can be grouped under two factors. The first of these factors can explain 54.954% of the total variance. The second factor explains 16.213% of the total variance. Together, the two factors have the power to explain 71.167% of the total variance. This rate is a very high disclosure rate. Therefore, it would be more appropriate to explain the reasons why people do not use digital banking in Turkiye with 2 factors rather than 12 components.

Table 16. Explained amounts of variance

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**%Cumulative**	**Total**	**% of Variance**	**%Cumulative**	**Total**	**% of Variance**	**%Cumulative**
1	6,595	54,954	54,954	6,595	54,954	54,954	6,295	52,460	52,460
2	1,946	16,213	71,167	1,946	16,213	71,167	2,245	18,707	71,167
3	,800	6,668	77,835						
4	,602	5,016	82,851						
5	,393	3,273	86,124						
6	,363	3,025	89,150						
7	,320	2,670	91,819						
8	,303	2,527	94,347						
9	,213	1,777	96,124						
10	,173	1,443	97,567						
11	,164	1,363	98,929						
12	,129	1,071	100,000						

As seen in **Table 17**, the first 8 components are collected under the 1st Factor, and the last 3 components are collected under the 2nd Factor. The factors reached at the final stage, based on the opinions of experts in the field of banking; why customers do not use digital banking and why customers make transactions through bank branches are named. The factors obtained after factor analysis and the naming of these factors are given in **Table 18**.

Table 17. Rotated components matrix

	Component	
	1	2
I think digital channels make banking transactions easier.	,906	,142
I think digital banking transactions are easy.	,900	,143
I think digital channels save time in performing banking transactions.	,893	,151
In general, I find digital channels useful for banking activities.	,891	,178
I find digital banking transactions safe.	,823	,025
I know how banking activities are carried out through digital channels.	,816	,092
I think digital channels reduce costs in banking transactions.	,805	,096
I have sufficient knowledge about banking transactions that can be carried out through digital channels.	,730	-,014
I think the digital banking infrastructure is sufficiently developed in Türkiye.	,698	,199
Having a contact person while performing banking transactions gives me confidence.	,176	,869
It is important for me to document banking transactions after performing them.	,168	,840
I can easily access bank branches that provide traditional banking services.	-,008	,794

Table 18. Table of Factors Emerged After Factor Analysis

Why don't customers use digital banking?	Why do customers make transactions through bank branches?
* I have sufficient knowledge about banking transactions that can be carried out through digital channels. * I find digital banking transactions safe. * I think digital channels make banking transactions easier. * I think digital channels save time in performing banking transactions. * I think digital banking transactions are easy. * In general, I find digital channels useful for banking activities. * I think digital channels reduce costs in banking transactions. * I know how banking activities are carried out through digital channels. * I think the digital banking infrastructure is sufficiently developed in Türkiye.	* Having a contact person while performing banking transactions gives me confidence. * I can easily access bank branches that provide traditional banking services. * It is important for me to document banking transactions after performing them.

It is possible to define the feeling of trust as the reason why customers generally make transactions at bank branches. Among the reasons why the customer performs transactions at bank branches are to obtain documents after their transactions, and to think that their objection will be made with these documents if necessary. Distrust and lack of sufficient information seem to be the main reasons why customers do not use digital banking. Reasons such as fear of making mistakes in internet/mobile banking transactions or money being trapped in automatic withdrawal/deposit machines devices also reduce digital banking usage. In addition, not knowing exactly what transactions to make through digital channels and how to carry out transactions through digital channels can be among the reasons for not using digital banking.

4. Results

Factor analysis results identified two primary factors explaining digital banking adoption barriers: lack of trust and lack of knowledge. These factors explain approximately 71% of the total variance. ANOVA results indicate statistically significant differences across age, education, and income groups. Younger individuals, highly educated individuals, and higher-income individuals show significantly higher adoption rates. These findings confirm that demographic and behavioral factors play a critical role in digital banking adoption in emerging markets.

5. Discussion

The findings align with fintech adoption theory and emerging market literature (Oliveira et al., 2014). Trust

remains the most critical determinant in emerging markets (Gefen et al., 2003). Unlike developed economies, emerging markets require additional trust-building measures and customer education. Financial institutions that want to increase their digital channel adoption rates should implement targeted strategies, including user training programs, improved security communications, and simplified digital interfaces.

6. Conclusion

This study provides empirical evidence on digital banking adoption barriers in Türkiye. The results demonstrate that trust and knowledge are the primary barriers, and demographic factors significantly influence adoption. These findings provide valuable insights for financial institutions and policymakers aiming to increase digital banking adoption in emerging markets. Future research may expand this analysis to other emerging economies.

Declarations

All authors declare that they have no conflicts of interest.

References

[1] Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers. International Journal of Bank Marketing, 35(5), 733–761. https://doi.org/10.1108/IJBM-01-2016-0001

[2] Ayo, C. K., Oni, A. A., Adewoye, O. J., & Eweoya, I. O. (2016). E-banking users' behaviour: E-service quality, attitude, and customer satisfaction. International Journal of Bank Marketing, 34(3), 347–367. https://doi.org/10.1108/IJBM-12-2014-0175

[3] Bayrakdaroğlu, A. (2012). A field study for factors affecting individuals' usage of internet banking. Business and Economics Research Journal, 3(4), 57–75.

[4] Beybur, M., & Çetinkaya, M. (2020). The impact of COVID-19 pandemic on usage of digital banking products and services in Turkey. Uluslararası Batı Karadeniz Sosyal ve Beşeri Bilimler Dergisi, 4(2), 148–163. https://doi.org/10.46452/baksoder.739722

[5] Beyoğlu, A. (2025). Türk bankacılık sektöründe dijital bankacılık verimlilik analizi. Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 43(2), 232–248. https://doi.org/10.17065/huniibf.1517751

[6] Bulut, E., & Çizgici Akyüz, G. (2020). Türkiye'de dijital bankacılık ve ekonomik büyüme ilişkisi. Marmara Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 42(2), 223–246. https://doi.org/10.14780/muiibd.854325

[7] Büyüköztürk, Ş. (2002). Faktör analizi: Temel kavramlar ve ölçek geliştirmede kullanımı. Kuram ve Uygulamada Eğitim Yönetimi, 32, 470–483.

[8] Chauhan, S., Akhtar, A., & Gupta, A. (2022). Customer experience in digital banking: A review and future research directions. International Journal of Quality and Service Sciences, 14(2), 311–348. https://doi.org/10.1108/IJQSS-05-2021-0077

[9] Conover, W. J., & Iman, R. L. (1981). Rank transformations as a bridge between parametric and nonparametric statistics. The American Statistician, 35(3), 124–129. https://doi.org/10.1080/00031305.1981.10479327

[10] Çon, Z., & Arıca, F. (2024). Dijital bankacılığın geleceği: Türkiye'deki yenilikler ve küresel trendler. Girişimcilik ve Kalkınma Dergisi, 19(2), 21–32.

[11] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008

[12] Deloitte. (2020, July 30). The acceleration of digitization as a result of COVID-19. https://www.deloitte.com/an/en/services/risk-advisory/blogs/acceleration-of-digitization-as-result-of-covid-19.html

[13] Demirel, A. C. (2017). Dijital bankacılık ve Türkiye'deki mevcut durumunun analizi [Master's thesis, Başkent University].

[14] Demirhan, M. (2021). Sectoral overview: The effects of digitalization in Turkish banking sector on the branch distribution channel. Erciyes Akademi, 35(1), 10–19. https://doi.org/10.48070/erciyesakademi.871533

[15] Esen, F. S. (2020). A technology acceptance based approach to digital banking use. Bilişim

Teknolojileri Dergisi, 13(4), 401–410. https://doi.org/10.17671/gazibtd.653927

[16] Eurostat. (2025). Individuals using the internet for internet banking [Data set]. https://ec.europa.eu/eurostat/databrowser/view/tin00099/default/table

[17] Garepasha, A., Aali, S., Bafandeh Zendeh, A. R., & Iranzadeh, S. (2021). Relationship dynamics in customer loyalty to online banking services. Journal of Islamic Marketing, 12(4), 830–863. https://doi.org/10.1108/JIMA-09-2019-0183

[18] Gefen, D., Karahanna, E., & Straub, D. (2003). Trust and TAM in online shopping. MIS Quarterly, 27(1), 51–90. https://doi.org/10.2307/30036519

[19] Jerenz, A. (2022, September 8). Winning in digital banking. McKinsey & Company. https://www.mckinsey.com/capabilities/tech-and-ai/our-insights/tech-forward/winning-in-digital-banking

[20] Kaplan, M., & Korkmaz, C. İ. (2020). Dijital bankacılık kullanım niyetine etki eden faktörler üzerine bir araştırma. Management and Political Sciences Review, 2(2), 69–85.

[21] Kaur, B., Kiran, S., Grima, S., & Rupeika-Apoga, R. (2021). Digital banking in Northern India: The risks on customer satisfaction. Risks, 9(11), Article 209. https://doi.org/10.3390/risks9110209

[22] Kurtuluş, K. (1998). Pazarlama araştırmaları. İstanbul Üniversitesi İşletme Fakültesi.

[23] Mbama, C. I., Ezepue, P., Alboul, L., & Beer, M. (2018). Digital banking, customer experience and financial performance: UK bank managers' perceptions. Journal of Research in Interactive Marketing, 12(4), 432–451. https://doi.org/10.1108/JRIM-01-2018-0026

[24] Mpofu, F. Y. (2023). Gender disparity and digital financial inclusion in advancing sustainable development goals. International Journal of Innovation in Management, Economics and Social Sciences, 3(3), 49–70. https://doi.org/10.52547/ijimes.3.3.49

[25] Nguyen, N. T. H., Kim-Duc, N., & Freiburghaus, T. L. (2022). Effect of digital banking-related customer experience on banks' financial performance during COVID-19: A perspective from Vietnam. Journal of Asia Business Studies, 16(1), 200–222. https://doi.org/10.1108/JABS-09-2020-0356

[26] Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. Advances in Health Sciences Education, 15(5), 625–632. https://doi.org/10.1007/s10459-010-9222-y

[27] Noyan, E., & Gavcar, E. (2020). Evaluation of customer satisfaction in digital banking with multi-criteria decision-making methods. MANAS Journal of Social Studies, 9(4), 2349–2363. https://doi.org/10.33206/mjss.757425

[28] Oliveira, T., Faria, M., Thomas, M. A., & Popovič, A. (2014). Extending the understanding of mobile banking adoption. Computers in Human Behavior, 34, 169–180. https://doi.org/10.1016/j.chb.2014.02.041

[29] Özkan, T., & İpekten, O. B. (2017). The factors influencing the decision of using internet banking services. Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 21(2), 647–664.

[30] Petrova, L. A., & Kuznetsova, T. E. (2020). Digitalization in the banking industry: Digital transformation of environment and business processes. Financial Journal, 12(3), 91–101. https://doi.org/10.31107/2075-1990-2020-3-91-101

[31] Schmidt-Jessa, K. (2023). The impact of COVID-19 on digital-only banks: Are they winners or losers? Journal of Banking Regulation, 24(3), 310–320. https://doi.org/10.1057/s41261-022-00196-0

[32] Shaikh, A. A., & Karjaluoto, H. (2015). Mobile banking adoption: A literature review. Telematics and Informatics, 32(1), 129–142. https://doi.org/10.1016/j.tele.2014.05.003

[33] Tabachnick, B. G., & Fidell, L. S. (2013). Using multivariate statistics (6th ed.). Pearson.

[34] Terzi, O. & İşli, A. G. (2020). Digital literacy in a digital world: A research on bank customers. Akdeniz Üniversitesi Sosyal Bilimler Enstitüsü Dergisi. (7), 50-67.

[35] Tam, C., & Oliveira, T. (2016). Understanding mobile banking individual performance. Internet Research, 26(3), 654–673. https://doi.org/10.1108/IntR-05-2014-0166

[36] Zeybek, H. (2018). Dijital bankacılık. Mali Çözüm Dergisi, 28(150), 79–107.