

**ADOPTION OF MOBILE BANKING  
APPLICATIONS:  
A STUDY ON YOUNG PEOPLE  
Master's Thesis  
Monzur Morshed PATWARY  
Eskişehir, 2017**

**ADOPTION OF MOBILE BANKING APPLICATIONS: A STUDY ON YOUNG  
PEOPLE**

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**MASTER'S THESIS**

**Department of Business Administration**

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**Eskişehir**

**Anadolu University Graduate School of Social Sciences**

**May, 2017**

## FINAL APPROVAL FOR THESIS

This thesis titled “**Adoption of Mobile Banking Applications: A Study on Young People**” has been prepared and submitted by **Monzur Morsch PATWARY** in partial fulfillment of the requirements in “**Anadolu University Directive on Graduate Education and Examination**” for the Master of Arts **Department of Business Administration Program in Finance** has been examined and approved on **25/05/2017**.

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## ÖZET

### MOBİL BANKACILIK UYGULAMALARINI BENİMSEME NİYETİNİ ETKİLEYEN FAKTÖRLER: GENÇLER ÜZERİNDE BİR ÇALIŞMA

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Bu çalışmanın temel amacı, gençlerin Mobil Bankacılık uygulamalarını benimseme niyetini etkileyen faktörleri araştırmaktır. Teknoloji Kabul Modeli ile birlikte Güven'e dayanarak oluşturulan anketlerle, Türkiye'den (217 katılımcı) birincil veri toplanmıştır. Faktör analizi ve Yapısal Eşitlik Modellemesi (YEM) ile elde edilen bulgular, Algılanan Kullanışlılık Mobil Bankacılık Uygulamalarının Benimseme Niyetini olumlu olarak etkilediğini ortaya çıkarmaktadır. Ayrıca, Güven de Mobil Bankacılık Uygulamalarının Benimseme Niyetini olumlu olarak etkilemektedir. Dahası, Algılanan Kullanım Kolaylığı, hem Algılanan Kullanışlılık hem de Güveni olumlu etkilemektedir. Bu yüzden, Algılanan Kullanım Kolaylığı, Mobil Bankacılık Uygulamalarının Benimseme Niyetini söz konusu bu faktörler vasıtası ile etkilemektedir. Ayrıca, ANOVA Analizi ile, incelenen faktörler ve Mobil Bankacılık Uygulamalarının Benimseme Niyeti açısından kadın ve erkekler arasında istatistiksel olarak anlamlı fark bulunmamıştır.

**Anahtar Kelimeler:** Niyet, Güven, Mobil Bankacılık Uygulamaları, Teknoloji Kabul Modeli

## ABSTRACT

### ADOPTION OF MOBILE BANKING APPLICATIONS: A STUDY ON YOUNG PEOPLE

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MBA in Finance

Anadolu University, Graduate School of Social Science, May 2017

Advisor: Asst. Prof. Dr. Özlem SAYILIR

The main objective of this study is to explore factors which influence Intention of young people to adopt Mobile Banking Applications. Primary data were collected from Turkey (217 participants) through questionnaires grounded on Technology Acceptance Model (TAM) together with Trust (T). Through factor analysis and structural equation modeling (SEM), the findings revealed that the Perceived Usefulness has positive influence on Intention to adopt mobile banking applications. Additionally, Trust also has positive influence on Intention to adopt mobile banking applications. Furthermore, Perceived Ease of Use not only has positive influence on the Perceived Usefulness, but also on Trust. Therefore, Perceived Ease of Use affects Intention to adopt mobile banking applications through these factors. Moreover, no statistically significant differences were found by ANOVA between males and females with respect to the factors investigated and Intention to adopt mobile banking applications.

***Keywords:*** *Intention, Trust, Mobile Banking Apps, Technology Acceptance Model*

## **ACKNOWLEDGEMENT**

I would like to express my deepest gratitude and appreciation to all the people who have supported and contributed to complete this thesis paper.

I was truly fortunate and privileged to continue my thesis under the supervision of Assistant Professor Dr. Özlem SAYILIR. I was also supervised by Prof. Dr. Eduardas Freitakas from Vilnius University during my Erasmus semester. I am very thankful for their guidance and continuous encouragement. Their profound knowledge provided me an opportunity to develop my way of thinking and make noteworthy progress of the research.

I would also love to thanks MD Forid for assisting me during survey, data collection and throughout the thesis time.

Last but not least, I am very thankful to my parents (Abu Taher and Rahena Begum), siblings, and friends for their unconditional love and support and for being always by my side which have kept me positive throughout the whole time.

25 May 2017

### **ETİK İLKE VE KURALLARA UYGUNLUK BEYANNAMESİ**

Bu tez çalışmasının bana ait, özgün bir çalışma olduğunu; çalışmamın hazırlık, veri toplama, analiz ve bilgilerin sunumunda bilimsel etik ilke ve kurallara uygun davrandığımı; bu çalışma kapsamında elde edilmeyen tüm veri ve bilgiler için kaynak gösterdiğimi ve bu kaynaklara kaynakçada yer verdiğimi; bu çalışmanın Anadolu Üniversitesi tarafından kullanılan bilimsel intihal tespit programıyla tarandığını ve hiçbir şekilde intihal içermediğini beyan ederim. Her hangi bir zamanda, çalışmamla ilgili yaptığım bu beyana aykırı bir durumun saptanması durumunda, ortaya çıkacak tüm ahlaki ve hukuki sonuçlara razı olduğumu bildiririm.

Monzur Morshed PATWARY

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## **1. INTRODUCTION**

The introduction chapter has discussed the overview of the mobile banking and internet banking, theoretical background of the research, research approach, objectives and statement of purpose, research questions, and finally research outline.

### **1.1 Overview**

Mobile banking apps certainly added a new momentous to banking industry in last few years. In the last ten to fifteen years, people have been using internet banking in advanced countries while developing countries are still in adoption process of internet banking. Using applications in a smartphone through internet takes the banking services in a whole sophisticated level. The digital era has brought changes to social and, subsequently, to payment habits. Modern technologies and ground-breaking solutions bring payment services nearer to their users, contributing to continuous growth in the use of electronic payments (Bank of Lithuania, 2014, p. 28). Internet banking made credit transfers an especially expedient, quick and trustworthy way to transfer funds and pay for goods and services purchased online.

According The Banks Association of Turkey (TBB, 2016) analysis, total number of internet banking users in Turkey was approximately 20 millions at the end of 2016 which was only half of it in 2006. Özer and Gürel (2016) found that Türkiye İş Bankası is the first bank in Turkey to inaugurate internet banking in 1997. From their survey results they also revealed that almost all the bankers use internet banking, but using mobile banking application does not appear to have fully spread.

**Table 1** *Number of Customers Using Internet Banking Services in Turkey*

<b>Number of Customers Using Internet Banking Services</b>			
<b>Period</b>	<b>Total number of registered customers that logged in at least once</b>	<b>Total number of registered customers that logged in at least once in 1-year period</b>	<b>Number of active customers</b>
<b>Dec. 2015</b>	45,682,603	25,447,701	17,420,451
<b>March 2016</b>	47,585,279	26,498,205	18,511,135
<b>June 2016</b>	49,889,738	27,738,286	18,300,708
<b>Sept. 2016</b>	51,763,208	28,667,031	18,671,656
<b>Dec. 2016</b>	54,383,428	29,204,506	<b>20,398,627</b>

Source: *The Banks Association of Turkey (2016)*

However, data from the Banks Association of Turkey (2006) has discovered that mobile banking in Turkey is not lagging behind, it has nearly same figures as internet banking users. The current number of mobile banking users in Turkey is around 19 million (TBB, 2016). Nonetheless, they did not mention whether the mobile banking customers are using apps or sms banking. The amount of users for both internet banking and mobile banking will rapidly accelerate in the coming future since Turkey has population of more than 80 million.

**Table 2** *Number of Customers Using Mobil Banking Services in Turkey*

<b>Number of Customers Using Mobil Banking Services</b>			
<b>Period</b>	<b>Total number of registered customers that logged in at least once</b>	<b>Total number of registered customers that logged in at least once in 1-year period</b>	<b>Number of active customers</b>
<b>Dec. 2015</b>	19,012,020	15,531,349	12,164,368
<b>March 2016</b>	21,664,080	17,564,461	13,961,441
<b>June 2016</b>	24,754,620	19,929,141	15,205,484
<b>Sept. 2016</b>	27,258,037	21,262,742	16,613,229
<b>Dec. 2016</b>	30,750,567	24,494,136	<b>19,217,598</b>

Source: *The Banks Association of Turkey (2016)*

## 1.2 Theoretical Background

Mobile banking is winning the world by storm, accounting for over 590 million subscribers worldwide, and is expected to twice to exceed 1 billion by 2017. Today banking consumers will not transact with a bank that does not have internet banking and tomorrow banking customers will not transact with a Bank that does not have mobile banking (Bagaria, 2013, p.18).

The Banks Association of Turkey has listed all the banks those are offering mobile banking services for their clients. There are 49 banks in Turkey and out of them only 18 banks have mobile banking and 27 banks have internet banking service. Here, the facilities offered by the mobile banking are also listed. The IS Bank has been selected as an example, since it is the first bank to offer internet banking in Turkey.

**Table 3** *List of participating banks in mobile banking statistics in Turkey*

<b>List of participating banks in mobile banking statistics</b>	
1	Akbank T.A.Ş.
2	Alternatif Bank A.Ş.
3	BankPozitif Kredi ve Kalkınma Bankası A.Ş.
4	Citibank A.Ş.
5	Denizbank A.Ş.
6	Fibabanka A.Ş.
7	Finans Bank A.Ş.
8	HSBC Bank A.Ş.
9	ING Bank A.Ş.
10	Odea Bank A.Ş.
11	Şekerbank T.A.Ş.
12	Türk Ekonomi Bankası A.Ş.
13	Türkiye Cumhuriyeti Ziraat Bankası A.Ş.
14	Türkiye Garanti Bankası A.Ş.
15	Türkiye Halk Bankası A.Ş.
16	Türkiye İş Bankası A.Ş.
17	Türkiye Vakıflar Bankası T.A.O.
18	Yapı ve Kredi Bankası A.Ş.

**Source:** *The Banks Association of Turkey (2016)*

İş Cep provides several new and innovative features to personal and corporate customers to make their life easier. With Turkey's most comprehensive mobile banking application İşCep you can;

- Be an İşbank client with a very few easy phases without going to Is Bank outlets via “Instant Customer” (over 18 years old and Turkish citizens).
- Quickly obtain new customer PIN by using your Customer ID via “Instant PIN” option.
- Effortlessly do around 150 banking transactions with English support.
- Look at your financial statement investigating your deposits and debt at first glance.
- Access transactions to be made with the easy menu structure and choice to search transactions.
- Easily take out cash from ATMs (Bankamatiks) by means of QR Code and from new generation digital ATMs (İşCepMatiks) using QR code or Beacon technology.
- Ask for personal loan (max. 15.000 TRY) from home by signing a document via “Quick Loan”
- Get link directly to “Call Center” from home page and also after-login page
- Track the nearest branches and ATMs via “Nearest İşbank”.
- See adhoc promotions special for İşCep via “Shopping Campaigns”
- Join competitions special for İşCep via “Competition”
- Get the latest financial news on “Economy Bulletin”
- Easily accumulate money in one account for special organizations such as meals, birthday parties via “Social Account” application
- Access the free internet at almost 5,000 TTNET WiFi hotspots located in all provinces of Turkey via “İşCep Wi-fi” service

*Source: İşCep İş Bank Mobile Banking Apps (İşBank, 2016)*

Though there are increasing numbers of clients for mobile banking apps through internet banking, very few study has been done why customers are adopting mobile banking apps over other banking modes.



### **1.3 Research Approach**

This research develops and studies a theoretical extension of the Technology Acceptance Model (TAM) (Davis, 1989, p.318) with Trust and investigates the factors that influence the adoption and acceptance of the mobile banking applications in Turkey.

The technology acceptance model (TAM) is largely recommended for technology-based viewpoint by two system structures of perceived usefulness (PU) and perceived ease of use (PEOU) (Davis et al., 1989, p.318). In this extension, trust is incorporated as an important antecedent of perceived usefulness, perceived ease of use, and intention. The study will be, perhaps, a means for answering low rate mobile banking apps usage reasons by exhibiting more information.

### **1.4 Objectives and Statement of Purpose**

There are many studies about internet banking; however, there are very few studies about mobile banking apps of internet banking in Turkey. Moreover, the extant literature appears limited by its narrow focus on SMS banking in developing countries; virtually no studies address the use of m-banking applications via smartphones or tablets or consider the results of such usage (Shaikh & Karjaluoto, 2014, p.129). The purpose of this study is to find what factors are influencing customers to adopt mobile applications or mobile banking apps.

The main objectives of this study are;

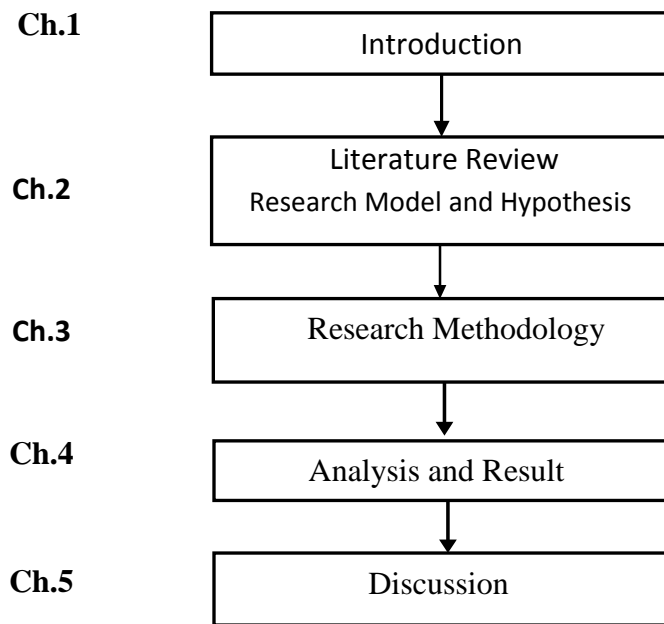
- ✚ Investigate the adoption of mobile banking apps by individuals in Turkey as an example of a developed country.
- ✚ Evaluate the current state of consumer beliefs and perceptions toward mobile banking apps, and develop as well as validate the relationships between the factors that drive the adoption and acceptance of such services.
- ✚ Propose prospects of mobile banking apps for both participants and researchers to uncover unobserved problems, thus improving the use and acceptance of mobile banking apps.

## 1.5 Research Questions

The research is done based on the following research questions:

1. What are the factors influencing the adoption of mobile banking apps of internet banking over the conventional banking by Turkish banking consumers?
2. What is the role of social impact (Trust) in acceptance of mobile banking apps?
3. Is there any difference among factors for Male and Female?

## 1.6 Research Outline



**Figure 1** *Research outline*

## **2. LITERATURE REVIEW**

Chapter two has designed with both existing literature and theoretical overview of the mobile banking applications. At the end of the chapter, the hypothesis of the study has been drawn based on the literature.

### **2.1 Conception of Internet banking and Mobile Banking Apps**

#### **2.1.1 Internet banking**

Internet banking, which is also known as online banking or web banking has become the model of many simple dealings performed by bank through internet. Internet banking provides various facilities for their clients for example checking balance, transferring and receiving currency, paying bills, and many more by an organized financial system (Safeena et al., 2013, p.146). Internet banking is the latest in the series of technological wonders of the last decade. ATMs, Tele-Banking, Internet Banking, Credit Cards and Debit Cards have emerged as effective delivery channels for traditional banking products. Internet or Electronic or online banking is the newest delivery channel to be offered by retail banks in many developed countries, and there is a wide agreement that this channel will have a significant impact on the market. Banks know that the Internet opens up new horizons for them and moves them from local to global frontiers (Safeena et al., 2013, p.146). Internet Banking means that banking services such as services introduction, loan application, account balance inquiry, fund transfer and so forth are provided by a bank through the Internet. Internet banking has evolved into a “one step service and information unit” that promises great benefits to both banks and consumers (Baraghani, 2008, p.28)

Safeena, Date, Hundewale, and Kammani (2013, p.146) have also mentioned in their research that Internet banking refers to systems that enable bank customers to get access to their accounts and provide general information on bank products and services over the use of bank’s website, without the involvement or inconvenience of sending letters, faxes, original signatures and telephone confirmations. In its humblest form, electronic banking may mean the delivery of information about the bank and its products via a page on the internet. It is the types of services through which bank clienteles can demand information and carry out most retail banking amenities such as balance reporting, inter-account transfers,

bill-payment, etc., via a telecommunication network without leaving their homes or organizations.

According to Michael Karlin, the President and Chief Operation Officer of the world's first virtual bank, Security First Network Bank, the idea of Internet Banking is as follows:

1. You do not have to purchase any software, store any data on your computer, back up any information, since all transactions occur on the bank server over the infrastructure of the Internet.
2. You will be able to conduct your banking services anywhere you like but you need to have a computer and internet connection, no matter where you are (e.g. at home, at office, or in a place outside the country)
3. You can use the banking services 24 hours a day, 7 days a week, and 365 days a year. You no longer have to reconcile a bank statement or manually track your ATM and paper checks.

### **2.1.2 Mobile banking**

M-banking dates to the end of the 1990s when the German company Paybox, in collaboration with Deutsche Bank, launched the first service. Initially, it was deployed and tested mostly in European countries: Germany, Spain, Sweden, Austria, and the United Kingdom. Among developing countries, Kenya was the first to introduce a text-based m-banking service, M-Pesa, in 2007. By 2012, there were more than seven million registered M-Pesa users in Kenya (Shaikh & Karjaluto, 2014, p.129). As Veijalainen et al. (2006, p.229) argue the main driving force for the fast acceptance of small mobile devices is the know-how they offer for obtaining services and running applications at any time and any place, including while on the move. Researchers use various terms to refer to mobile banking, including m-banking (Liu et al., 2009), branchless banking (Ivatury and Mas, 2008, p.46), m-payments, m-transfers, m-finance (Donner and Tellez, 2008, p.318), or pocket banking (Amin et al., 2006, p.10).

Today mobile banking applications are growing as a new retail channel for banks. Mobile banking is a focal point of growth strategies for both the banking and mobile carrier industries (Goswami and Raghavendran, 2009, p.14). Banks, through mobile banking applications, provide a combination of payments, banking, real-time two-way data transmission, and ubiquitous access to financial information and services (Jacob, 2007, p.240). It is now taken for granted that the mobile phone as a channel for service consumption offers enormous potential in banking (Laukkanen and Lauronen, 2005, p.325). Previous studies indicate the factors contributing to the adoption of mobile banking include convenience, access to the service regardless of time and place, privacy and savings in time and effort (Laukkanen, 2007, p.393).

New mobile technologies such as mobile websites, smartphones, and tablets allow users and financial service providers to interact practically free of time or space constraints. As mobile phones are basically communication devices, they can be used for several other purposes, such as for executing financial or banking transactions (W.-T. Wu, Chen, & Chang, 2016, p.431). The global market for mobile entertainment goods and services grew from \$17.3 billion in 2006 to \$76.9 billion in 2011. In recent years, worldwide mobile payment transaction values surpassed \$171.5 billion in 2012, marking a 61.9% increase from 2011 values of \$105.9 billion, according to Gartner, Inc. An analyst from Gartner also expected global mobile transaction volume and value to average 42% annual growth between 2011 and 2016 and forecasted a market worth \$617 billion with 448 million users by 2016 (Gartner, Inc., 2014).

Mobile technologies and broadband are essential for mobile banking services, which are defined as a subset of e-banking performed in a wireless environment (Coursaris & Hassanein, 2002, p.247). Certainly, mobile banking (also known as m-banking, SMS banking, etc.) is a form of banking transaction carried out via a mobile phone; it refers to banking and financial services carried out with telecommunication devices. Mobile banking be a subset of banking electronics and an extension of Internet banking with its own characteristics (Laukkanen & Passanen, 2008, p.86). Indeed, mobile banking means that users adopt mobile terminals to access various payment services, such as account balance enquiry, transference, bill payment, and financial management (Zhou, 2012, p.1518).

## **2.2 Theory of the Models used in the Research**

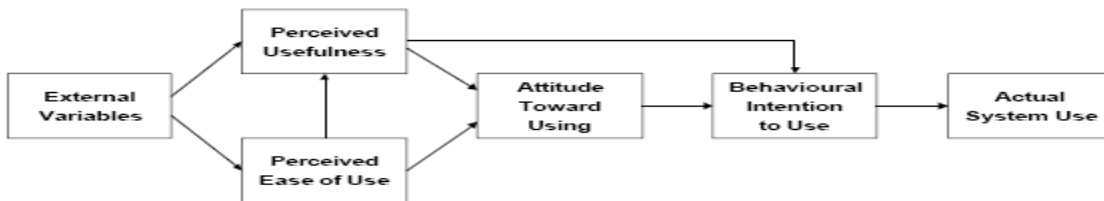
### **2.2.1 Technology acceptance model (TAM)**

Technology Acceptance Model (TAM), introduced by Davis (1989, p.318), is an adaptation of the Theory of Reasoned Action (TRA) specifically designed for modeling user acceptance of information systems. The goal of TAM is to offer an explanation of the factors of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified. Ideally one would like a model that is helpful, not only for prediction, but also for justification, so that researchers and experts can identify why a particular system may be unacceptable, and track appropriate corrective steps. A key purpose of TAM, therefore, is to provide a basis for tracing the impact of external factors on internal beliefs, attitudes, and intentions. TAM was framed to achieve these objectives by identifying a small number of fundamental variables suggested by previous research dealing with the cognitive and affective determinants of computer acceptance, and using TRA as a theoretical backdrop for modeling the theoretical relationships among these variables.

As Figure 2.1 shows, TAM suggests that two particular beliefs, perceived usefulness (PU) and perceived ease of use (PEOU), are the primary relevance for computer acceptance behavior. PU is defined as the degree to which a potential user believes that using a particular system would enhance his or her job performance. This follows from the definition of the word “useful”: “capable of being used gainfully”. Within an organizational context, people are generally reinforced for good performance by raises, promotions, bonuses, and other rewards (Pfeffer, 1982, p.224; Vroom, 1964). A system high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive use-performance relationship.

PEOU refers to the degree to which a potential user believes that using a particular system would be free of effort. This follows from the definition of “ease”: “freedom from difficulty or great effort”. Effort is a finite resource that a person may assign to the various activities for which he or she is responsible. All else being equal, an application perceived

to be easier to use than another is more likely to be accepted by users. In January 2000, the Institute for Scientific Information's Social Science Citation Index® listed 424 journal citations of the two journal articles that introduced TAM (i.e. Davis et al. 1989, p.318). The results strongly support the extended TAM in predicting users' intentions to adopt mobile banking (Luarn & Lin, 2005, p.873). In the past decade, TAM has become well established as a robust, powerful, and parsimonious model for predicting user acceptance.



**Figure 2** *Technology Acceptance Model*,  
**Source:** *Davis, 1989*

### **2.2.1.1 Perceived ease of use (PEOU)**

Perceived ease of use is defined as “the degree to which a person believes that using a particular system would be free of effort” (Davis, 1989, p.318). A large number of previous researches have shown that perceived usefulness and perceived ease of use about mobile banking have significant effect on user’s attitude thus influence the intention toward internet banking and mobile banking (Cheng, Lam, & Yeung, 2006, p.1558)(Hernandez, Mazzon, Jose´ Afonso Mazzon, & Mazzon, 2007, p.72)(Safeena et al., 2013, p.146)(Wang, Wang, Lin, & Tang, 2003)(Daud et al., 2011, p.252). In addition, Chitungo & Munongo (2013) has found from their research in Zimbabwe that perceived usefulness, perceived ease of use, relative advantages, personal innovativeness and Subjective norm have significant effect on user’s attitude thus influence the intention toward mobile banking. Widespread research over the past decade provides proof of the significant effect perceived ease of use on intention to use (Karahanna et al, 1999, p.51; Taylor and Todd, 1995, p.144; Lau, 2002; Davis, 1989, p.318; Norzaidi and Intan Salwani, 2009, p.298). Karahanna et al, (1999, p.51) found that perceived ease of use had a significant positive effect on intention to adopt the software among the prospective adopters. Likewise, bank customers are likely to adopt online banking when it is easy to use the technology (Guriting and Ndubisi, 2006, p.6). Similarly, in the study of Lau (2002) about online trading system, it was concluded that

perceived ease of use was significantly associated with intention toward using the online trading system. Ramayah et al (2003, p.29) revealed that perceived ease of use has proven to have significant impact on the development of initial willingness to use Internet banking. The result validates the findings by Wang et al, (2003, p.501), Adam et al (1992, p.227), Davis et al (1989, p.318) and Ramayah et al (2002, p.82).

Daud et al., (2011, p.252) has found from their study that TAM model can predict consumer intention to use mobile banking. As the TAM has been applied to online business, perceived ease of use has also been found to be a significant antecedent of intention to use online store (Moon et al, 2001). Thus, perceived ease of use, predicts the end-user's beliefs on a technology and therefore predicts its acceptance (Ma and Liu, 2004; Dabis et al, 1989, p.318; Venkatesh and Davis, 2000, p.186).

#### ***2.2.1.2 Perceived usefulness (PU)***

Perceived usefulness is one of the fundamental elements of TAM. Perceived usefulness is defined as “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis et al, 1989, p.318). Previous Studies show that Perceived Usefulness has a significant influence on adoption of mobile banking and internet banking (Akturan & Tezcan, 2012, p.444)(Cheng et al., 2006, p.1558)(I. L. Wu & Chen, 2005, p.784)(Safeena et al., 2013, p.146)(Daud et al., 2011, p.252)(S., M.R., & Mitra, 2016, p.1092). Similar study from Pakistan (Raza & Hanif, 2013, p.82) shows that perceived usefulness (PU), information of internet banking (INF), perceived risk (PR), security and privacy (SP) shows more influence to increase the intention of external customers to adopt internet banking services. Perceived usefulness is strongly connected with productivity. It suggests that using computers in the workplace would upturn user's productivity, progress job performance, and augment job effectiveness and usefulness. Earlier studies have shown that there is a positive correlation between perceived usefulness and intention to use (Yang, 2004; O'Cass et al, 2003; Karahanna et al, 1999, p.51; Taylor and Todd, 1995, p.144). According to (Cheng et al., 2006, p.1558), Perceived Usefulness has a direct effect on Intention of accepting internet banking. Yang (2004) has found that consumer's perceived usefulness influence intention to use M-commerce in Singapore. Similarly, in the online context, the positive effect of perceived usefulness on behavioral



intentions to use the online retailer has been supported by scholars (Gefen and Straub, 1997, p.51; Koufaris, 2002; Lin and Lu, 2000). The initial results of the study from (Jahangir & Begum, 2008, p.32) indicate that perceived usefulness, ease of use, security and privacy, and customer attitude are significantly and positively related to customer adaptation. Chen et al (2002) pointed out that perceived usefulness is the main antecedent of intention to use online retailer and its website. These studies confirm the important effect of perceived usefulness in understanding individual responses to information technology. Therefore, it is highly predictable that people use mobile services because they find it useful. Prior related studies demonstrate that perceived usefulness is a key antecedent of the intention to use mobile services of adopting the WAP-enabled phones (Nysveen et al, 2003).

## **2.3 Other Intention Based Models**

### **2.3.1 Theory of reasoned action (TRA)**

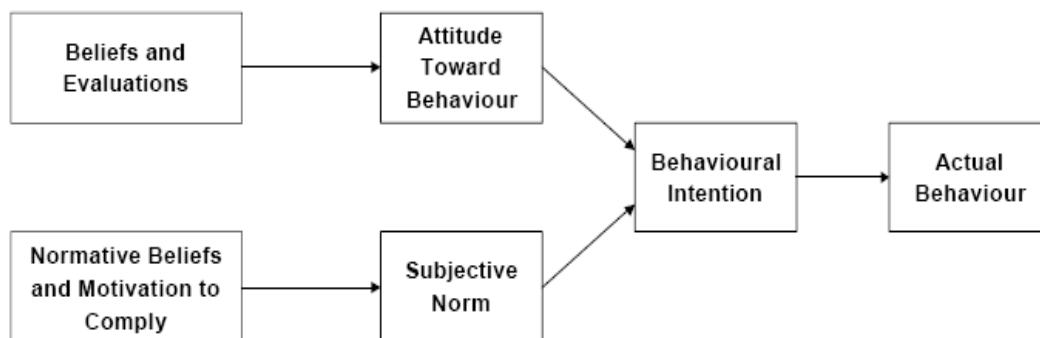
The Theory of Reasoned Action is a widely-studied model from social psychology, which is concerned with the factors of consciously intended behaviors (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). It is composed of attitudinal, social influence, and intention variables to predict behavior. Figure 3 is a schematic representation of the relationships among constructs in TRA. It is hypothesized by TRA that the individual's behavioral Intention (BI) to perform a behavior is mutually determined by the individual's Attitude toward performing the Behavior (ATB) and Subjective Norm (SN), which is the general perception of what relevant others think the individual should or should not do. The significance of ATB and SN to predict BI will vary by behavioral domain. For behaviors in which attitudinal or personal-based influence stronger (e.g., purchasing something for personal consumption only), ATB will be the dominant predictor of BI, and SN will be of little or no predictive efficacy. While for behaviors in which normative implications are strong (e.g., purchasing something that others will use), SN should be the dominant predictor of BI, and ATB will be of lesser importance (Ajzen and Fishbein, 1980).

The Theory of Reasoned Action also hypothesizes that BI is the only direct antecedent of actual behavior (AB). BI is anticipated to predict AB accurately if the three boundary conditions specified by Fishbein and Ajzen (1975) can be hold: (a) the degree to

which the measure of intention and the behavioral criterion correspond with respect to their levels of specificity of action, target, context, and time frame; (b) the stability of intentions between time of measurement and performance of the behavior; and (c) the degree to which carrying out the intention is under the volitional control of the individual (i.e., the individual can decide at will to perform or not to perform the behavior). Moreover, TRA is a general model that does not specify the beliefs that are operative for a particular behavior. Researchers using TRA must first identify the beliefs that are salient for subjects regarding the behavior under investigation.

Fishbein and Ajzen (1975) and Ajzen and Fishbein (1980), suggest prompting five to nine salient beliefs using free response interviews with representative members of the subject population. They recommend using “modal” salient beliefs for the population, found by taking the beliefs most frequently produced from a representative sample of the population.

The TRA has been successfully applied to many situations to predict the performance of behavior and intentions. For example, TRA predicted turnover (Prestholdt et al., 1987, p.221); education (Fredricks and Dossett, 1983, p.501); and breast cancer examination (Timko, 1987). In a meta-analysis of research on the Theory of Reasoned Action, Sheppard et al. (1988, p.325) concluded that the predictive utility of the TRA was strong across conditions.



**Figure 3** *Theory of Reasoned Action*

**Source:** *Fishbein and Ajzen, 1975*

### **2.3.2 Theory of planned behavior (TPB)**

Sheppard et al. (1988, p.325) pointed out two problems of the theory. First, one must distinguish the difference between behaviors from intention. This could be problematic because a multiplicity of factors in addition to one's intentions determines how the behavior is performed. Second, there is no provision in the model for considering whether the probability of failing to perform is because one's behavior or due to one's intentions. To deal with these problems, Ajzen (1985, p.11) extended the Theory of Reasoned Action by including another construct called Perceived Behavioral Control (PBC), which foretells behavioral intentions and behavior. The extended model is called the Theory of Planned Behavior (TPB). Accordingly, the three indicators in this theory, i.e. attitude, subjective norm and perceived behavioral control, can be interpreted as attitude for technology role, subjective norm for organizational members and social system roles, and perceived behavioral control for individual role.

#### ***2.3.2.1 Attitude, Subjective Norm, and Behavioral Control***

Ndubisi and Sinti (2006, p.6) has done a research about consumer's attitude in adoption of internet banking and the study shows that the attitudinal factors play a significant role in internet banking adoption in Malaysia. M-banking attitude thus serves as a mechanism between the information content and form elements of M-banking and user's transaction intentions. This favorable attitude toward M-banking stems from the user's assessment that the information provided is personally relevant, in line with his/her needs, precise and up-to-date (S. et al., 2016, p.1092). As similar study from Turkey (Akturan & Tezcan, 2012, p.444) shows that perceived usefulness, perceived social risk, perceived performance risk and perceived benefit directly affect attitudes towards mobile banking, and that attitude is the major determinant of mobile banking adoption intention. From Lee (2009, p.130) research work results indicated that the intention to use online banking is positively affected mainly by perceived benefit, attitude and perceived usefulness. Additionally, Fink (2005, p.295) has found the similar result which indicates that attitudinal factors appear to encourage the adoption of internet banking in Thailand. In the decomposed TPB model, only relative advantage and complexity are related to attitude (Shih and Fang, 2003, p.213). Moreover, Suh and Han (2002, p.247) have found that trust is one of the most

significant beliefs in explaining a customer's attitude towards using Internet banking. As suggested by the TAM, customer perception of the usefulness and ease of use also affect attitude significantly. At the same time, behavioral intention use Internet banking is highly related to attitude, perceived usefulness, and trust. Prior computer experience, prior technology experience, personal banking experience, reference group, and computer attitudes strongly affect attitude and behavior towards online banking, specifically, the relationship between personal banking experience and attitude was found to be critical (Karjuoto, Mattila, and Pentto, 2002). From Tan and Teo (2000, p.5) study results revealed that attitudinal and perceived behavioral control factors, rather than social influence, play a significant role in influencing the intention to adopt Internet banking. Thus, it can be concluded from the literature that attitude has positive influence in technology adoption decision.

### **2.3.3 Trust**

The functionality and contribution of trust can be apparently identified from the economic framework of social exchange (Kelley and Thibaut, 1978; Kelley, 1979). Moreover, trust was further explained more clearly in terms of a number of trust antecedents: knowledge-based trust, cognition-based trust, calculative-based trust, institution-based trust, and personality-based trust (Zucker, 1986, p.53; Gefen et al., 2003, p.51). (Suh & Han, 2002, p.247) conducted a study regarding internet banking and in that study, they introduced trust as another belief that has an impact on the acceptance of Internet banking. They collected 845 cases on the Web to survey users' behavior towards Internet banks. The results of statistical analyses using structural equation modeling indicate that trust has a significant impact on the acceptance of Internet banking. The wide-ranging literature review of trust across disciplines by Rousseau et al. (1998) reveals that, regardless of the underlying discipline of authors, confident expectations and willingness to be vulnerable are critical components of all definitions of trust. The most commonly cited definition in the literature is the one proposed by Mayer et al.'s (1995), which has adopted in this research: "The willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustee, irrespective of the ability to monitor or control that other party".

## 2.4 Trust and TAM

The relations between trust and TAM have been extensively discussed in literature in that the connections between PU, PEOU, and trust are hypothesized in many online-based business settings (Gefen et al., 2003, p.51, Pavlou, 2003, p.69; Saeed et al., 2003, p.26; Gefen, 2004, p.263).

In particular, a model of Trust and TAM was well defined in on-line shopping setting (Gefen et al., 2003, p.51). This model clearly indicated their relationship as Trust is an antecedent of PU, PEOU is an antecedent of trust, and trust has a direct influence on behavioral intention to use. Trust is one of the determinants of PU, especially in an on-line environment, because part of the guarantee that consumers will sense the expected usefulness from the web site is based on the sellers behind the web site. Moreover, trust is recognized to have positive effect on PU since trust allows consumers to become vulnerable to e-vendor to ensure that they gain the expected useful interaction and service (Pavlou, 2003, p.69). While consumers initially trust their e-vendors and have an idea that adopting online service is beneficial to their job performance, they will believe that the on-line service is useful (Gefen et al., 2003, p.51).

However, PEOU is hypothesized to have positive impact on trust because PEOU can help promote customers' favorable impression on e-vendors in the initial adoption of online service and further, cause customers to be willing to make investment and commitment in buyer-seller relationship (Ganesan, 1994; Gefen et al., 2003, p.51). In general, while following the definition of social cognitive theory, PEOU can be argued to positively influence a person's favorable outcome expectation toward the acceptance of an innovative technology (Bandura, 1986). This is because cognition-based trust, as discussed previously, is mainly built on the first impression of a person toward certain behavior and extensively, PEOU in terms of on-line service can be considered the first feeling or expectation established for further continued on-line transaction. In sum, the Trust and TAM model is relatively fitted to this Mobile Banking Apps, while there are additional variables to be included in the particular context. Several independent and dependent variables appear in investigations of varying aspects of consumer decision-making

processes related to m-banking adoption. In particular, three main dependent variables (attitude, intention, and usage) and eight independent variables [perceived ease of use, perceived usefulness, trust, social influence, perceived risk, perceived behavioral control (or self-efficacy), compatibility with lifestyle and device, and facilitating conditions emerged from this review and has found that Trust, TAM, and TPB are related as an antecedent (Shaikh & Karjaluoto, 2014, p.129). From Chong et al. (2010, p.267) study results prove that perceived usefulness, trust and government support show a significant impact on internet banking adoption and Trust is an antecedent of TAM.

## **2.5 Trust and TPB**

The relationship between trust and TPB can be examined in a variety of aspects, in which trust is hypothesized as the common antecedent of attitude, perceive behavioral control, and subjective norm. For attitude construct, trust in online business is viewed as a salient behavioral belief that directly affects customer's attitude toward the purchase behavior. While an e-vendor is trustworthy, it is more possible that the consumer will gain benefits and avoid possible risks from adopting on-line service (McKnight and Chervany 2002, p.35; Pavlou, 2003, p.69). As cost-benefit paradigm greatly influences people's attitudinal beliefs and outcome judgments, trust can be a direct influencer that determines people's attitude toward behavior (Bandura, 1986; Davis et al., 1989, p.318). Besides, research has shown that trust definitely increases the confidentiality of business relationship and determines the quality of transaction between buyers and sellers as well as people's outcome expectation on many commerce activities (Hosmer, 1995, p.379). According to social cognitive theory, outcome expectation refers to people's estimation of a given behavior yielding a particular outcome, which is closely related to people's attitude toward behavior (Bandura, 1986). Therefore, trust is apparently an important antecedent of attitude toward the on-line transaction behavior.

For perceived behavioral control construct, trust can increase perceived behavioral control over on-line transactions since the virtual interactions between customers and e-vendors become more expectable (Pavlou, 2002, p.69). For subjective norm construct, researchers have found that mutual trust and mutual influence between users and IS units

are highly correlated to each other based on a study concerning the performance of information system group (Nelson and Coopriider, 1996, p.227). Therefore, whatever types of trust are with direct and indirect influences on subjective norm, they are all the important antecedents of subjective norm in on-line service.

For subjective norm construct, researchers have found that mutual trust and mutual influence between users and IS units are highly correlated to each other based on a study concerning the performance of information system group (Nelson and Coopriider, 1996, p.227). Furthermore, Decomposed TPB revealed that there are peer and superior influences on users for determining subjective norm toward IS usage (Taylor and Todd, 1995, p.144). Derivatively, it can be predicted that trust in peers and superiors about their beliefs of IS usage should play a role in determining subjective norm. Similarly, trust in e- vendors about their reputation, brand name, and service may positively influence subjective norm over the behavior of on-line transactions. Besides, they may indicate certain relationship between trust in peers and superiors and trust in vendors. As the opinions from the referents of peers and superiors are positive for certain e-vendors in the market, trust in peers and superiors in this situation can enhance user beliefs in trusting these e-vendors and in turn, subjective norm toward the behavior of on-line transactions. Therefore, it can be drawn that Trust has direct or indirect influence on Subjective Norms on online services like internet banking or mobile banking apps. Moreover, Burcu et al. (2009, p.18) have analyzed main factors for using the internet banking and have obtained trust and security is significant factors.

## **2.6 Model and Hypothesis Developments**

Technology Acceptance Model (TAM) and Trust that have been introduced in the literature review helped the study to develop research model and hypothesis. In the TAM model, it has been found that both perceived usefulness and perceived ease of use has positive influence toward adoption of internet banking as well as mobile banking. Additionally, Trust also has been found to have positive effect on adoption of mobile banking. Hence, based on the literature reviews the following hypotheses are developed.

H1: Perceived Usefulness has influence on intention to adopt Mobile Banking Apps

H2: Trust has influence on intention to adopt Mobile Banking Apps

H3: Perceived Ease of Use has influence on Perceived Usefulness to use Mobile Banking Apps

H4: Perceived Ease of Use has influence on Trust to adopt Mobile Banking Apps



### **3. RESEARCH METHODOLOGY**

Chapter three has discussed the both sample selection and data collection methods. Then, this chapter has also outlined how those data has been interpreted in this research.

#### **3.1 Sample of the Study**

Convenience sampling method has been used in the study. The target population of this study was the young people in Turkey. Based on the target population the convenience sampling method has been developed. In the convenience sampling method, usually called the availability sampling, is a non-probability sampling method that relies on the data collection from the population members who are conveniently available to participate in the study (Sukhatme, 1954).

##### **3.1.1 Same size**

Sample size affects precision of all statistical estimates, including those made in factor analysis. Various researchers have proposed rules of thumb for sample size minimums that are function of the ratio of the number of people to number of measured variables. Gorsuch (1983) recommended that an absolute minimum ratio is five individuals to every variable, but not less than 100 variables for any analysis. However, some Monte Carlo simulation research (Guadagnoli & Velicer, 1988, p.265) suggested that the most critical issue is how saturated the factors are by the measured variables. The sample size of this research is 217, which is way above the requirement for factor analysis.

In total, 350 questionnaires were distributed in Eskisehir of Turkey as hard copies as well as soft copies. Among them, only 217 questionnaires have been counted final questionnaires since 217 respondents replied they use mobile banking applications. The questionnaire was developed based on the literature of the study as well as technology acceptance model and trust.

Following table presents constructs and their corresponding measurements sources used for questionnaire.

**Table 4** *Questionnaire constructs sources*

Construct	Definition	Source
Perceived Ease of Use	The degree to which a person believes that using mobile banking apps would be free of effort	Davis et al., 1989, p.318
Trust	Trust refers to the belief that the promise of another can be relied upon and that, in unforeseen circumstances, the other will act in a spirit of goodwill and in a benign fashion toward the thruster. Trust has three characteristics: ability, benevolence, and integrity.	Mayer et al., 1995
Intention	A person readiness to adopt mobile banking apps	Davis et al., 1989, p.318

The absolute questionnaire involves of two sections. The first section collects general information about respondents like age, occupation, gender, age, and education level. The additional section is about awareness of respondents about mobile banking apps. The five point likert scale has been used for statements of the second section ranging from “1” for strongly disagree, “2” disagree, “3” neither agree nor disagree, “4” agree, “5” for strongly agree.

### **3.1.2 Data collection method**

Primary data has been used in this study. Primary data has collected through questionnaire in Eskisehir, Turkey. The purpose of the study is to find the factors influencing the adoption of mobile banking apps in Turkey.

### **3.2 Types of Statistical software and Tests applied**

The relationship of the proposed model and the properties of the scale were analyzed using Statistical Package for Social Sciences (SPSS 23) and SPSS AMOS 20. Both demographic analysis of the questionnaire and main questionnaire analysis have conducted

by SPSS plus SPSS AMOS. The demographic analysis has done through the Frequency Analysis of SPSS.

### **3.2.1 Exploratory factor analysis (EFA)**

Factor analysis can be used for various purposes such as to inform evaluation of score validity, to develop theory regarding the nature of the constructs, and to summarize relationships in the form of a more parsimonious set of factor scores that can then be used in subsequent analysis (Thompson 2004, p.27). Exploratory factor analysis (EFA) in actuality involves a linear sequence of decisions each involving a menu of several available choices of factors (Thompson 2004, p.27). Given that there are five major decisions, with many choices at each decision point, the number of different analysis combinations that are available to the researcher is quite large. These five decisions address the following questions:

1. Which matrix of associations coefficient should be analyzed?
2. How many factors should be extracted?
3. Which method should be used to extract the factors?
4. How should the factors be rotated?
5. How should the factor scores be computed if factor scores are of interest?

Exploratory factor analysis (EFA) has been used in the analysis with the help of SPSS to extract the number of factors and to obtain actual factors which influence on adoption of mobile banking apps.

### **3.2.2 Reliability test**

The analysis has then started with Reliability Test of the data/questionnaire. Cronbach's Alpha was used to determine the internal reliability of the multi items variable. The next step of data analysis is to test the reliability of the measures. Reliability analysis is a measure of the internal consistency of indicators for a construct (Hair et al, 1998). The purpose of reliability analysis is to determine how well a set of items taps into some common sources of variance (Viswanathan, 2005), and it is frequently measured with Cronbach's coefficient alpha. Cronbach's coefficient alpha is "the ratio of the sum of the covariance's

among the components of the linear combination (items), which estimates true variance, to the sum of all elements in the variance-covariance matrix of measures, which equals the observed variance” (Nunnally and Bernstein, 1994). Better results of reliability for the questionnaire if the Cronbach’s Alpha gets to 1.0. In general, reliabilities less than 0.60 are considered poor, those in the 0.70 range, acceptable and those over 0.8 good (Sekaran, 2006).

### **3.2.3 Structural equation modeling (SEM)**

Structural Equation Modeling has been used in the study through SPSS AMOS. Structural Equation Modeling has been used to test the hypothesis of the research. In general, Structural Equation Modeling is defined as “a class of methodologies that seeks to represent hypotheses about the means, variances, and covariances of observed data in terms of a smaller number of structural parameters defined by a hypothesized underlying model (Kaplan, 2000). Structural Equation Modeling, though stemming from econometrics, is increasingly applied in various disciplines such as psychology, sociology, political science, education, and in business-related disciplines like marketing, strategy, and management accounting research (Nachtigall et al. 2003, p.22). A structural equation model consists of the measurement models, which link the observed variables to the latent variables, i.e. to the constructs; and the structural part, which links the latent variables to each other using systems of simultaneous equations (Kaplan, 2000).

Structural Equation Modeling provides estimates of the strength of all the hypothesized relationships between the constructs in theoretical models, comparing, most importantly, the model to the empirical data. This comparison is accomplished by means of fit statistics. The fit statistics can be used for accepting or rejecting the assumed relationships between the latent and observed variables (measurement models) on the one hand, and the latent variables (structural model) on the other.

### **3.2.4 Confirmatory factor analysis (CFA)**

To test the hypotheses of varied sources of variability, which underscores common characteristics of a group of score, the Confirmatory Factor Analysis (CFA) is employed (Hoyle, 2000, p.465). EFA and CFA share commonality like seeking to take into cognizance

as much deviation or variance as possible from manifest variables having a lesser group of unobserved variables (Albright and Park, 2009, p.2; Hayton et al., 2004, p.192). Even though CFA could singularly make utmost sense in the testing of hypotheses regarding the similarities or otherwise in a group of variables, it is “best understood” as a detail of the general SEM (Hoyle, 2000, p.465). CFA, aside factor scores mixes out lots of goodness-of-fit measures as well as standardized solution, unstandardized solution (Albright and Park, 2009, p.2) and the likes aimed at giving high credence to the hypotheses testing. The CFA significantly applied on the entire hypotheses testing in this study.

#### ***3.2.4.1 Model fit statistics for CFA***

The fit statistics has performed in this research to find out whether the model is perfectly fit or not. A good model fit would provide an insignificant result at a 0.05 threshold (Barrett, 2007, p.815). The Goodness-of-Fit statistic (GFI) was created by Jöreskog and Sorbom as an alternative to the Chi-Square test and calculates the proportion of variance that is accounted for by the estimated population covariance (Tabachnick and Fidell, 2007). As with the GFI, values for the AGFI also range between 0 and 1 and it is generally accepted that values of 0.90 or greater indicate well-fitting models. Values for the SRMR range from zero to 1.0 with well-fitting models obtaining values less than .05 (Byrne, 1998; Diamantopoulos and Siguaw, 2000), however values as high as 0.08 are deemed acceptable (Hu and Bentler, 1999, p2). Values for Normed-fit index (NFI) statistic range between 0 and 1 with Bentler and Bonnet (1980, p.588) recommending values greater than 0.90 indicating a good fit. The Comparative Fit Index (CFI: Bentler, 1990) is a revised form of the NFI which takes into account sample size (Byrne, 1998) that performs well even when sample size is small (Tabachnick and Fidell, 2007). As with the NFI, values for this statistic range between 0.0 and 1.0 with values closer to 1.0 indicating good fit. Root mean square error of approximation (RMSEA) in the range of 0.05 to 0.10 was considered an indication of fair fit and values above 0.10 indicated poor fit (MacCallum et al, 1996, p.130). It was then thought that an RMSEA of between 0.08 to 0.10 provides a mediocre fit and below 0.08 shows a good fit (MacCallum et al, 1996, p.130).

### **3.2.4 ANOVA analysis**

Analysis of variance (ANOVA) is a collection of statistical models used to analyze the differences among group means and their associated procedures (such as "variation" among and between groups), developed by statistician and evolutionary biologist Ronald Fisher. ANOVA is a statistical model appropriate when you have a continuous response variable and one or more categorical predictor variables (Dimaggio, 2013, p.5). ANOVAs are useful for comparing (testing) three or more means (groups or variables) for statistical significance. Here, finally, ANOVA analysis has been conducted in the study to check whether is there any difference between and among variable's mean of Male and Female.

## 4. ANALYSIS AND RESULT

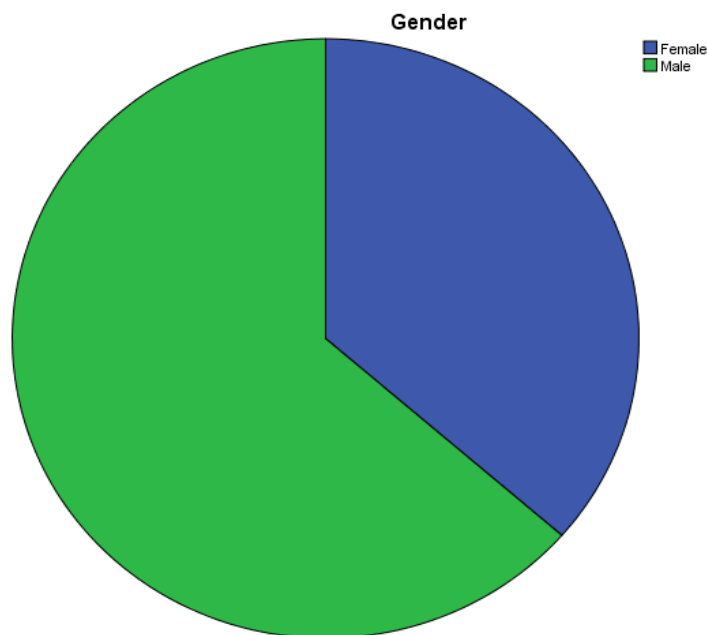
### 4.1 Demographic Analysis

To get the data for analysis of the study, 350 questionnaires have distributed in Eskisehir in Turkey. Among 350 questionnaires, only 217 questionnaires have been collected as completed response since 217 respondents said that they are using mobile banking applications. Here, the demographic analysis of the respondents has been conducted through SPSS frequency analysis. Four categories have been used for demographic analysis of the respondents, such as Gender, Age, Education, and Occupation.

**Table 5** Demographic Analysis of Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	79	36.4	36.4	36.4
	Male	138	63.6	63.6	100.0
	Total	217	100.0	100.0	

Source: SPSS



**Figure 4** Demographic Analysis of Gender

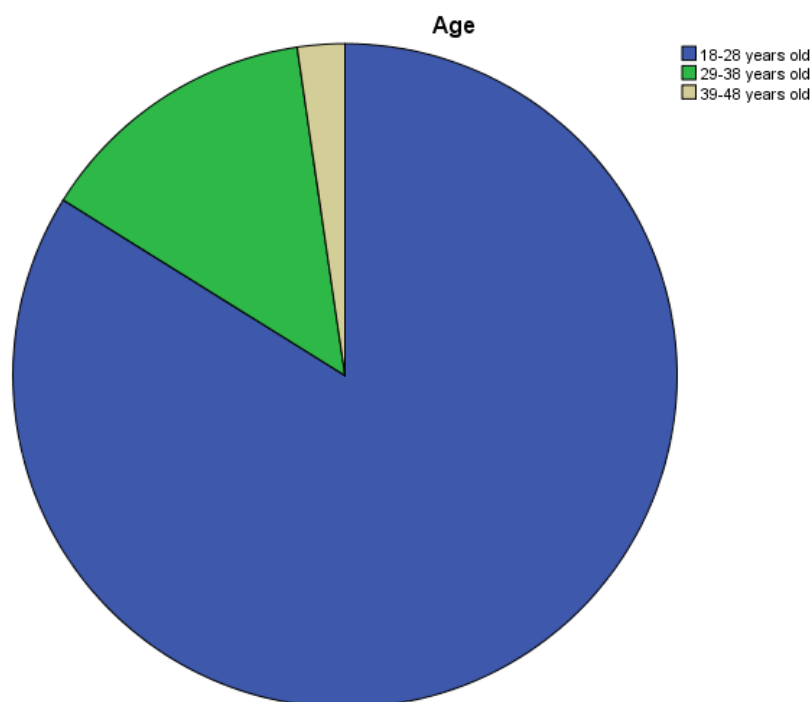
Source: SPSS

At first, the gender has been analyzed through frequency analysis. The analysis has revealed that 36.4 percent respondents are female and 63.6 percent are male among 239 participants.

**Table 6** Demographic Analysis of Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-28 years old	182	83.9	83.9	83.9
	29-38 years old	30	13.8	13.8	97.7
	39-48 years old	5	2.3	2.3	100.0
Total		217	100.0	100.0	

Source: SPSS



**Figure 5** Demographic Analysis of Age

Source: SPSS

Additionally, the analysis also has exhibited the age groups of the respondents. The findings show that among the male and female, 83.9% of the respondents were young and their age group ranged from 18 to 28 years. Moreover, among the rest only 30 respondents were from middle aged group and 5 respondents were more than 38 years old. However,

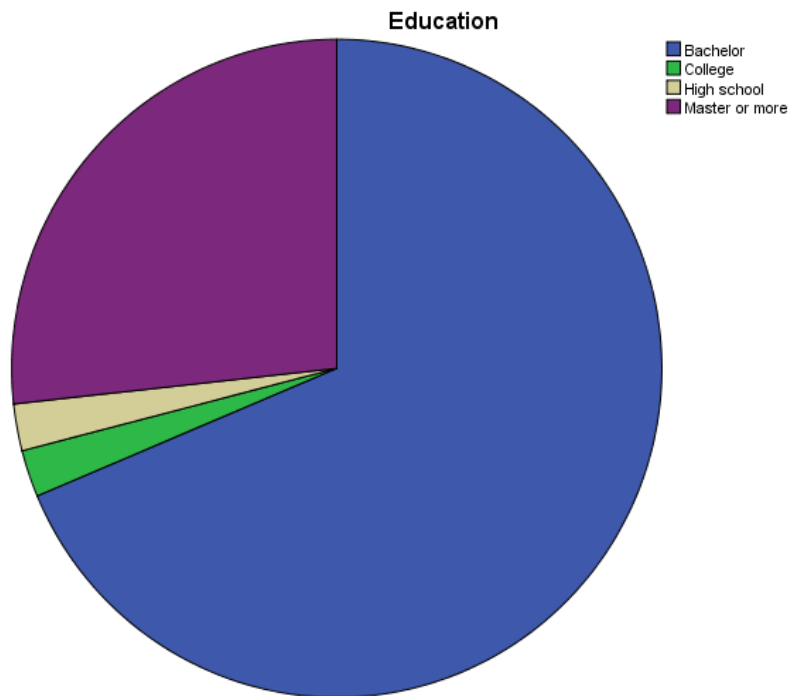


since the research is about the mobile banking apps adoption of young people in Turkey, most of the respondents (182 participants to be exact) are from the young age group.

**Table 7** Demographic Analysis of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	149	68.7	68.7	68.7
	College	5	2.3	2.3	71.0
	High school	5	2.3	2.3	73.3
	Master or more	58	26.7	26.7	100.0
	Total	217	100.0	100.0	

Source: SPSS



**Figure 6** Demographic Analysis of Education

Source: SPSS

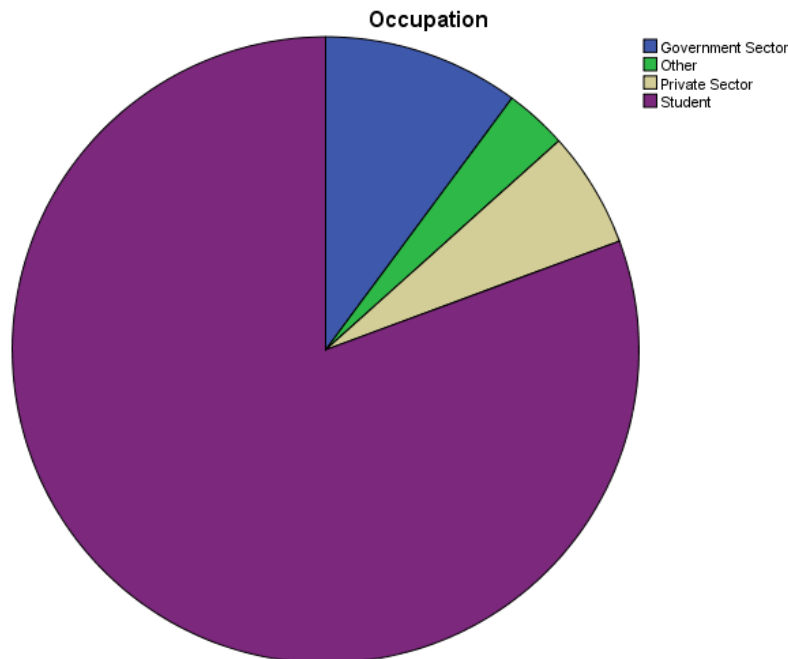
Further, the demographic analysis has also been conducted on education level of the survey participants. Approximately 7 in 10 (68.7 percent) people responded that they have a bachelor degree or they are enrolled in a bachelor degree. And then, 26.7 percent respondents

confirmed that they are pursuing their masters or have a master degree. Rest of the participants said they have a college diploma or high school diploma.

**Table 8** Demographic Analysis of Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Government Sector	22	10.1	10.1	10.1
	Other	7	3.2	3.2	13.4
	Private Sector	13	6.0	6.0	19.4
	Student	175	80.6	80.6	100.0
	Total	217	100.0	100.0	

Source: SPSS



**Figure 7** Demographic Analysis of Occupation

Source: SPSS

Since most of the respondents are from the youth group aged from 18 to 28, maximum number of them are students as well. It has been obtained from the survey that around 80.6% of the participants are students. Among rest of the respondents, 6% has private

job, 10% is working in the government sector, and 3.2% are doing business or looking for job.

## 4.2 Exploratory Factor Analysis (EFA)

A critical decision in any EFA is determining how many factors to retain. There are numerous strategies for making this decision with the hope that different approaches to will corroborate each other. Here, factor analysis has been conducted to retain the main factors of mobile banking apps adoption in both Turkey, which can be used in subsequent analysis.

### 4.2.1 Descriptive analysis

**Table 9** Descriptive Statistics of EFA

	Mean	Std. Deviation	Analysis N
INT1	3.70	1.265	217
INT2	4.00	1.180	217
INT3	4.13	1.089	217
INT4	3.94	1.191	217
T1	3.65	1.053	217
T2	3.85	1.027	217
T3	3.68	1.016	217
T4	3.53	.986	217
PU1	4.04	.957	217
PU2	4.33	.839	217
PU3	4.32	.950	217
PU4	3.98	.991	217
PEU1	3.84	1.015	217
PEU2	3.84	1.073	217
PEU3	4.00	.998	217

Source: SPSS

The descriptive analysis has been carried out to check the mean and standard deviations of each item. The descriptive statistics presents that Intention, Trust, Perceived Ease of Use have higher standard deviation comparing to Perceived Usefulness.

#### 4.2.2 Sampling adequacy (KMO and Bartlett's Test)

**Table 10** *KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.908	
Bartlett's Test of Sphericity	Approx. Chi-Square	1894.935
	df	105
	Sig.	.000

**Source:** *SPSS*

The KMO and Bartlett's Test were conducted in the study to check the sampling adequacy of the research. In general, Kaiser-Meyer-Olkin Measure of Sampling Adequacy more than .50 is acceptable with Bartlett's Test of Sphericity significance level  $P < .001$ . Thus, in this study the sampling adequacy seems to be excellent since the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is .908 plus Bartlett's Test of Sphericity (Chi-Square/  $\chi^2$ ) is 1894.935 with significance level of  $P < .001$  and degree of freedom (df) 105. Hence, the sampling of this research is appropriate according to The KMO and Bartlett's Test.

### 4.2.3 Total variance explained

**Table 11** Total Variance Explained of EFA

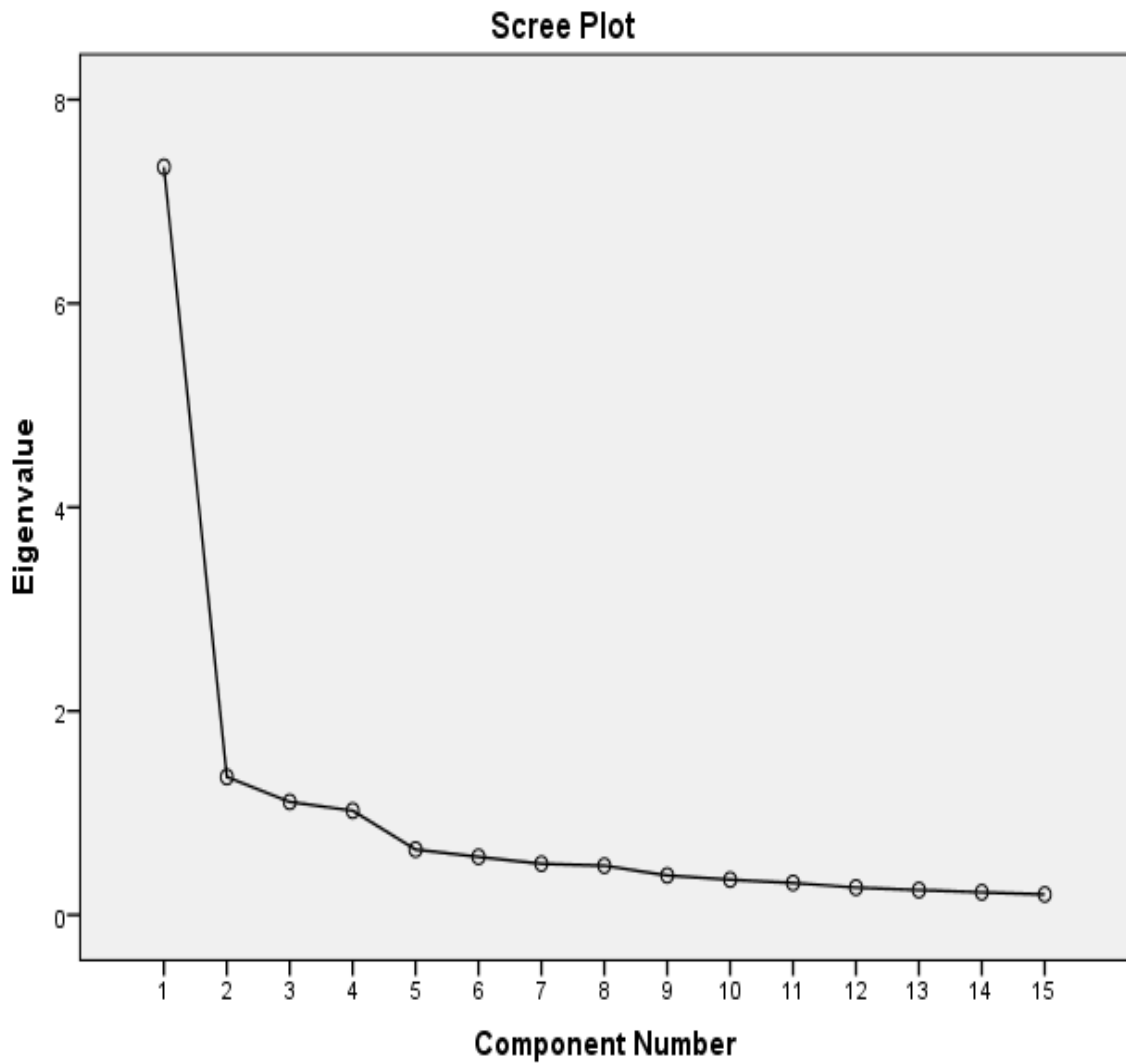
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.340	48.932	48.932	7.340	48.932	48.932	4.595
2	1.353	9.023	57.954	1.353	9.023	57.954	5.195
3	1.108	7.389	65.343	1.108	7.389	65.343	4.707
4	1.023	6.818	72.161	1.023	6.818	72.161	4.079
5	.640	4.270	76.431				
6	.570	3.797	80.228				
7	.502	3.347	83.575				
8	.483	3.223	86.798				
9	.387	2.583	89.381				
10	.345	2.303	91.683				
11	.314	2.093	93.776				
12	.268	1.786	95.562				
13	.244	1.625	97.187				
14	.221	1.475	98.662				
15	.201	1.338	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

**Source:** SPSS

Total variance explained has conveyed with Principal Component Analysis method to retain the loaded factors. The total variance explained exhibits that the four components have been extracted from the all components with cumulative percentage of Extraction Sums of Squared Loadings 72.161% approximately. The total variance explained should be above 70% for social science researches, according to Stevens' (2002, p. 390). Thus, the analysis seems to be in the acceptable range of factor analysis.



**Figure 8** *Factor Scree Plot*  
**Source:** SPSS

Here, the Scree Plot has unveiled that the 4 factors are above the eigenvalue 1, where the first factor has the highest value. The clarification of why the first factor has the biggest figure can be explained in the pattern matrix of the factor analysis where extracted factors will be exhibited.

#### 4.2.4 Pattern matrix of the factors

**Table 12** *Pattern Matrix of EFA*

	Component			
	Trust	Intention	PerceivedU	PerceivedEU
INT1		.778		
INT2		.832		
INT3		.842		
INT4		.807		
T1	.719			
T2	.565			
T3	.676			
T4	.771			
PU1			.498	
PU2			.880	
PU3			.870	
PU4			.610	
PEU1				.653
PEU2				.941
PEU3				.686

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 7 iterations.

**Source:** SPSS

The Pattern Matrix has been conducted with Principal Component Analysis extraction method and Oblimin with Kaiser Normalization rotation method. According to the Pattern Matrix of the study, four factors have been loaded. Among them Trust became the first factor of the Exploratory Factor Analysis (EFA). Intention, subsequently, has ordered as the second factor. Following the Intention, Perceived Usefulness appears to be the third factor. Finally, Perceived Ease of Use has become the fourth factor of the exploratory factor analysis. Suppress of small coefficients less than .40 (measurement for factor loading)

has been selected for this study. Hence, those items with a coefficient less than .40 will not be loaded.

#### 4.2.5 Reliability test for each factor

The reliability test which is Cronbach Alpha has been conducted through the SPSS to determine the reliability of each factor extracted from the EFA. Better results of reliability for the questionnaire if the Cronbach's Alpha approaches 1.0. In general, reliabilities less than 0.60 are considered poor, those in the 0.70 range, acceptable and those over 0.8 good (Sekaran, 2006).

**Table 13** Reliability Statistics for Factor 1

<b>Case Processing Summary</b>			
		N	%
Cases	Valid	217	100.0
	Excluded <sup>a</sup>	0	.0
	Total	217	100.0

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.824	4

<b>Item Statistics</b>			
	Mean	Std. Deviation	N
T1	3.65	1.053	217
T2	3.85	1.027	217
T3	3.68	1.016	217
T4	3.53	.986	217

**Source:** SPSS

The reliability statistics shows that the first factor (Trust) used in the research has perfect consistency in the measurement. Here, the Cronbach's Alpha result is .824 which means that 82.4% data are reliable in this study. Hence, factor one has passed the Cronbach's Alpha reliability test and the study can continue for further analysis.



**Table 14** Reliability Statistics for Factor 2

**Case Processing Summary**

		N	%
Cases	Valid	217	100.0
	Excluded <sup>a</sup>	0	.0
	Total	217	100.0

**Reliability Statistics**

Cronbach's Alpha	N of Items
.877	4

**Item Statistics**

	Mean	Std. Deviation	N
INT1	3.70	1.265	217
INT2	4.00	1.180	217
INT3	4.13	1.089	217
INT4	3.94	1.191	217

**Source:** SPSS

The reliability statistics presents that the second factor (Intention) used in the research has very good consistency in the measurement. Here, the Cronbach's Alpha result is .877 which means that 87.7% data are reliable in this study for the second factor. Hence, the factor three has passed the Cronbach's Alpha reliability test and the study can continue for further analysis.

**Table 15** Reliability Statistics for Factor 3

**Case Processing Summary**

		N	%
Cases	Valid	217	100.0
	Excluded <sup>a</sup>	0	.0
	Total	217	100.0

**Reliability Statistics**

Cronbach's Alpha	N of Items
.848	4

**Item Statistics**

	Mean	Std. Deviation	N
PU1	4.04	.957	217
PU2	4.33	.839	217
PU3	4.32	.950	217
PU4	3.98	.991	217

**Source:** SPSS

The reliability statistics presents that the third factor (Perceived Usefulness) used in the research has perfect consistency in the measurement. Here, the Cronbach's Alpha result is .848 which means that 84.8% data are reliable in this study for the Trust. Hence, factor three has passed the Cronbach's Alpha reliability test and the study can continue for further analysis.

**Table 16** Reliability Statistics for Factor 4

**Case Processing Summary**

		N	%
Cases	Valid	217	100.0
	Excluded <sup>a</sup>	0	.0
	Total	217	100.0

**Reliability Statistics**

Cronbach's Alpha	N of Items
.820	3

**Item Statistics**

	Mean	Std. Deviation	N
PEU1	3.84	1.015	217
PEU2	3.84	1.073	217
PEU3	4.00	.998	217

**Source:** SPSS

Finally, the reliability statistics presents that the fourth factor (Perceived Ease of Use) used in the research has very good consistency in the measurement. Here, the Cronbach's Alpha result is .820 which means that 82% data are reliable in this study for the Perceived Ease of Use. Hence, factor four has passed the Cronbach's Alpha reliability test and the study can continue for further analysis.

**Table 17** *The whole output of the exploratory factory analysis*

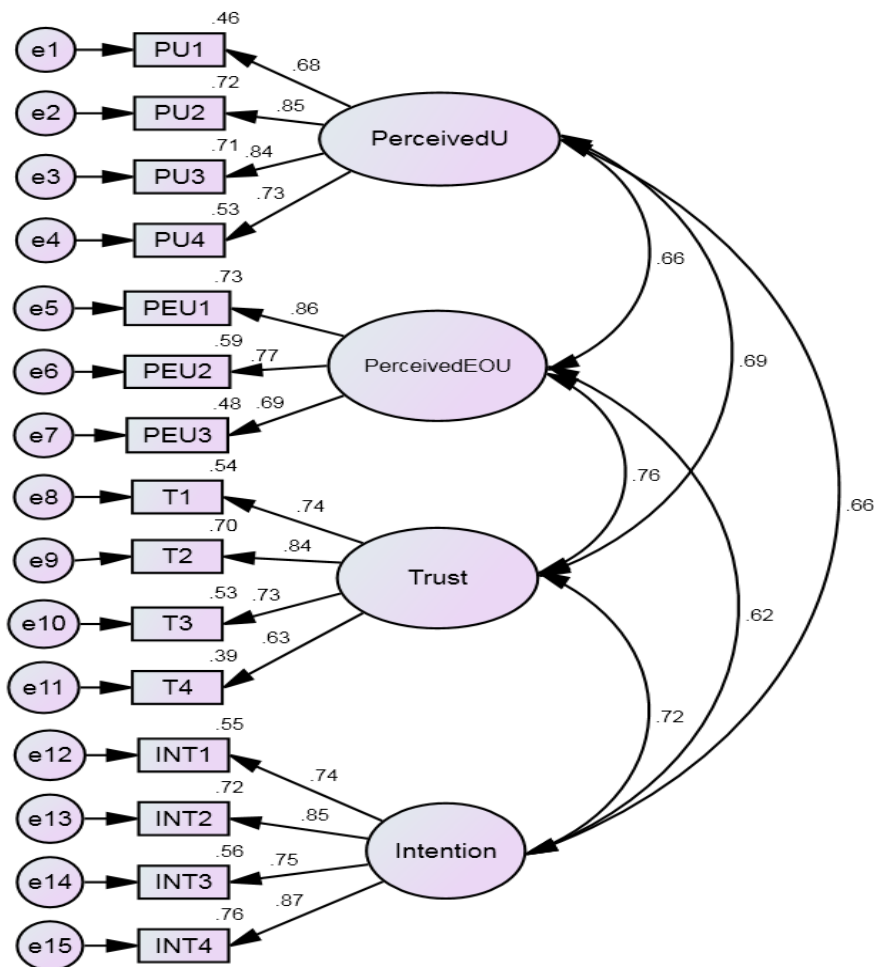
	Mean	Std. Deviation	Factor Loading	Cronbach Alpha	% of Variance Explained
<b>Intention</b>					
I have interest to use Mobile Banking Apps	3.70	1.265	.778		
I plan to use Mobile Banking Apps	4.00	1.180	.832		
May be, I'll use Mobile Banking Apps in future	4.13	1.089	.842		
I am determined to use Mobile Banking Apps	3.94	1.191	.807		
				.877	9.023
<b>Trust</b>					
The Mobile Apps for Banking is trustworthy	3.65	1.053	.719		
I trust in the benefits of the Mobile Apps for Banking	3.85	1.027	.565		
Mobile Apps for Banking keeps its promises and commitments	3.68	1.016	.676		
Mobile Apps for Banking keeps customers' best interests in mind	3.53	.986	.771		
				.824	48.932
<b>Perceived Usefulness</b>					
Using the Mobile Banking Apps improves my performance of banking activities	4.04	.957	.498		
Using the Mobile Banking Apps makes it convenient to do my banking activities	4.33	.839	.880		
Using the Mobile Banking Apps enables me to accomplish banking activities more quickly	4.32	.950	.870		
Using Mobile Apps would increase the quality or output of banking transaction	3.98	.991	.610		
				.84.8	7.389
<b>Perceived Ease of Use</b>					
My interaction with the Mobile Banking Apps is clear and understandable	3.84	1.015	.653		
Interaction with Mobile Banking Apps does not require a lot of mental effort	3.84	1.073	.941		
Mobile banking apps is simple to use	4.00	.998	.686		
				.82	6.818

**Source:** SPSS

### 4.3 Structural Equation Modeling (SEM)

#### 4.3.1 Measurement model

The confirmatory factor analysis (CFA) has conducted through SPSS Amos 20 to check how well the measured variables represent the number of constructs. Here measurement model has analyzed to obtain how well the fits in the model.



**Figure 9** Construct of CFA Measurement Model (Standard Coefficients)

Source: SPSS Amos

#### *4.3.1.1 Fit statistics of CFA*

The Chi-Square value is the traditional measure for evaluating total model fit and, ‘assesses the extent of inconsistency between the sample and fitted covariances matrices’ (Hu and Bentler, 1999, p.2). A good model fit would provide an insignificant result at a 0.05 threshold (Barrett, 2007, p.815). One example of a statistic that minimizes the impact of sample size on the Model Chi-Square is Wheaton et al’s (1977, p.84) relative/normed chi-square ( $\chi^2/df$ ). Although there is no consensus regarding an acceptable ratio for this statistic, recommendations range from as high as 5.0 (Wheaton et al, 1977, p.84) to as low as 2.0 (Tabachnick and Fidell, 2007).

The Goodness-of-Fit statistic (GFI) was created by Jöreskog and Sorbom as an alternative to the Chi-Square test and calculates the proportion of variance that is accounted for by the estimated population covariance (Tabachnick and Fidell, 2007). Related to the GFI is the AGFI which adjusts the GFI based upon degrees of freedom, with more saturated models reducing fit (Tabachnick and Fidell, 2007). Thus, more parsimonious models are preferred. In addition to this, AGFI tends to increase with sample size. As with the GFI, values for the AGFI also range between 0 and 1 and it is generally accepted that values of 0.90 or greater indicate well-fitting models. The acceptable value of AGFI is .80 (Scott 1995, p.43)

Values for the SRMR range from zero to 1.0 with well-fitting models obtaining values less than .05 (Byrne, 1998; Diamantopoulos and Siguaw, 2000), however values as high as 0.08 are deemed acceptable (Hu and Bentler, 1999, p2). An SRMR of 0 indicates perfect fit, but it must be noted that SRMR will be lower when there is a high number of parameters in the model and in models based on large sample sizes.

Values for Normed-fit index (NFI) statistic range between 0 and 1 with Bentler and Bonnet (1980, p.588) recommending values greater than 0.90 indicating a good fit. More recent suggestions state that the cut-off criteria should be  $NFI \geq .95$  (Hu and Bentler, 1999, p.2). Recommendations as low as 0.80 as a cutoff have been preferred however Bentler and Hu (1999, p.2) have suggested  $NNFI \geq 0.95$  as the threshold.

The Comparative Fit Index (CFI: Bentler, 1990) is a revised form of the NFI which takes into account sample size (Byrne, 1998) that performs well even when sample size is small (Tabachnick and Fidell, 2007). As with the NFI, values for this statistic range between 0.0 and 1.0 with values closer to 1.0 indicating good fit. A cut-off criterion of  $CFI \geq 0.90$  was initially advanced however, recent studies have shown that a value greater than 0.90 is needed to ensure that miss-specified models are not accepted (Hu and Bentler, 1999, p.2).

Root mean square error of approximation (RMSEA) in the range of 0.05 to 0.10 was considered an indication of fair fit and values above 0.10 indicated poor fit (MacCallum et al, 1996, p.130). It was then thought that an RMSEA of between 0.08 to 0.10 provides a mediocre fit and below 0.08 shows a good fit (MacCallum et al, 1996, p.130).

**Table 18** *Fit Statistics of CFA*

<b>Fit Statistics</b>	<b>Model value</b>
CMIN/DF	2.448
GFI	.889
AGFI	.842
CFI	.934
SRMR	.000
NFI	.894
RMSEA	.082

**Source:** SPSS

Here, confirmatory factor analysis (CFA) has been conducted to check the goodness of fit statistics of the model that used in the study. In the analysis, the Chi-Square ( $\chi^2$ ) is 205.609 with degree of freedom 84 and probability level is .000. The Chi-Square ( $\chi^2$ )/DF value is 2.448 which is below the threshold level of 5. So, the overall the model is very good and acceptable since the CMIN/DF value is less than 5.

The Goodness-of-fit statistic (GFI) is less than the well-fit level (.90 or above). The observed GFI is .889. Additionally, adjusted goodness-of-fit statistic (AGFI) is over the acceptable range which is .842. Moreover, the Comparative fit index (CFI) has been found

more than the well-fit level of .90. Here, the CFI is .934 which indicates that comparative fit index is well fit for this model of the study.

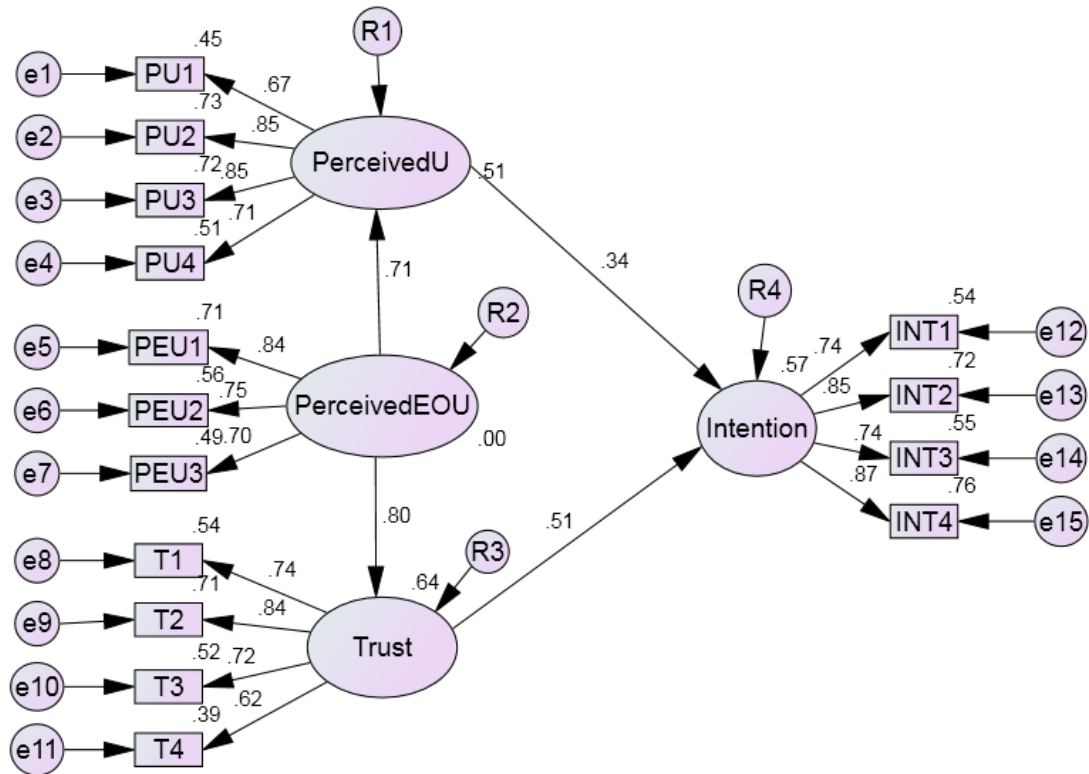
And then, Standardized root mean square residual (SRMR) is also well-fit in this research which should be at least .05 and the value of the SRMR of this research is .000 which is an indication of perfect model. However, the Normed fit index (NFI) is in acceptable level. The NFI observed value of the model of this study is .894 which is in mediocre fit range of the fit statistics. Finally, the Root mean square error of approximation (RMSEA) is in the good fit range of less than .08. The RMSEA of this research is .082 which is at the good fit level of the fit model.

Overall, the fit statistics shows that the model is good fit in this study. Thus, further analysis can be carried out in this study.



### 4.3.2 Results of hypothesis testing

The hypothesis of the model has been tested through SPSS AMOS. After developing an acceptable measurement model, the research has examined the structural model shown in the path diagram below.



**Figure 10** Construct of the SEM (Standard Coefficients)

Source: SPSS AMOS

#### 4.3.2.1 Fit statistics of structural model

**Table 19** *Fit Statistics of structural model*

<b>Fit Statistics</b>	<b>Model value</b>
CMIN/DF	2.554
GFI	.885
AGFI	.840
CFI	.928
SRMR	.000
NFI	.887
RMSEA	.085

**Source:** SPSS

In the analysis, the Chi-Square ( $\chi^2$ ) is 219.477 with degree of freedom 86 and probability level is .000. The Chi-Square ( $\chi^2$ )/DF value is 2.554 which is below the threshold level of 5. So, the overall the model is very good and acceptable since the CMIN/DF value is less than 5.

The Goodness-of-fit statistic (GFI) is less than the well-fit level (.90 or above). The observed GFI is .885. Additionally, adjusted goodness-of-fit statistic (AGFI) is over the acceptable range which is .842. Moreover, the Comparative fit index (CFI) has been found more than the well-fit level of .90. And then, Standardized root mean square residual (SRMR) is also well-fit in this research which should be at least .05. However, the Normed fit index (NFI) is in acceptable level. Finally, the Root mean square error of approximation (RMSEA) is in the acceptable fit range of less than .10.

### 4.3.2.2 Results of hypothesis testing

**Table 20** Regression Weights and Results

			Estimate	S.E.	C.R.	P	Label
PerceivedU	<---	PerceivedEOU	.719	.094	7.629	***	H3 Supported
Trust	<---	PerceivedEOU	.701	.095	7.394	***	H4 Supported
Intention	<---	PerceivedU	.448	.105	4.263	***	H1 Supported
Intention	<---	Trust	.762	.140	5.458	***	H2 Supported
PU4	<---	PerceivedU	1.000				
PU3	<---	PerceivedU	1.143	.099	11.566	***	
PU2	<---	PerceivedU	1.013	.087	11.595	***	
PU1	<---	PerceivedU	.910	.098	9.289	***	
PEU3	<---	PerceivedEOU	1.000				
PEU2	<---	PerceivedEOU	1.141	.116	9.822	***	
PEU1	<---	PerceivedEOU	1.218	.113	10.799	***	
T4	<---	Trust	1.000				
T3	<---	Trust	1.193	.140	8.549	***	
T2	<---	Trust	1.407	.149	9.446	***	
T1	<---	Trust	1.260	.145	8.669	***	
INT1	<---	Intention	1.000				
INT2	<---	Intention	1.072	.088	12.226	***	
INT3	<---	Intention	.870	.081	10.703	***	
INT4	<---	Intention	1.107	.089	12.495	***	

*Source: SPSS AMOS*

To test the statistical significance of the parameter estimates from SEM, the test statistic is the Critical Value (C.R.), which represents the parameter estimate divided by its standard error (S.E.). Based on a significance level of 0.05, the C.R. needs to be  $> \pm 1.96$ . Below this level, the parameter can be considered unimportant to the model (Cheng et al., 2006, p.1558).

It is obtained from the structural equation modeling analysis that the hypothesis H1(Perceived Usefulness has influence on intention to adopt Mobile Banking Apps), H2 (Trust has effect on intention to adopt Mobile Banking Apps), H3 (Perceived Ease of Use has influence on Perceived Usefulness to use Mobile Banking Apps), and H4 (Perceived Ease of Use has impact on Trust to use Mobile Banking Apps) have supported the study.

**Perceived Usefulness to Intention:** The regression weights show that Perceived Usefulness has positive influence on Intention to adopt mobile banking apps with estimates of SEM .448, standard error .105, critical value 4.263, and significant value  $P < .05$  which is statistically significant. Hence, for H1 we can reject the null hypothesis of the study. Perceived usefulness has positive impact on intention to adopt mobile banking apps explains that banking consumer believe using mobile banking apps would enhance her/his job performance such as taking less time for doing a banking transaction or client does not need to come to the branch as well as does not require a broadband connection for doing banking activities.

**Trust to Intention:** The construct of the model as well as regression weight draws that the trust (T) has positive influence on intention to adopt mobile banking apps among young people in Turkey with estimate of SEM .762, standard error .140, critical value 5.458, and significant value  $P < .05$  which interprets that the analysis is statistically significant. Here, trust refers to the belief of the existing and potential clients that the promise of mobile banking apps service provider can be relied upon. Hence, young people in Turkey perceives that the mobile banking apps service is trustworthy and acceptable without any doubt.

**Perceived Ease of Use to Perceived Usefulness and Trust:** Perceived ease of use (PEOU) which means user perceives that using a technology (mobile banking apps) will be free of effort. From the construct and regression analysis, the research has checked whether PEOU has any influence on Perceived Usefulness and Trust to adopt mobile banking apps by young population in Turkey. The research has revealed that Perceived ease of use has positive impact on Perceived Usefulness with estimate of SEM .719, standard error .094, critical value 7.629 and on Trust with estimate of SEM .701, standard error .095, critical value 7.39; therefore, on intention to accept mobile banking apps with a P value of less than

.05, which is statistically significant. Thus, the study has supported the hypothesis H3 and H4. It can be said that prospective mobile banking apps users in Turkey seem to think using mobile banking apps will be effortless; therefore, will have positive impact on perceived usefulness and trust to adopt mobile banking apps.

#### 4.4 ANOVA Analysis based on Gender

Analysis of variance (ANOVA) has been performed in the study to check whether there is a difference between Turkey and Lithuania, since the data has been collected from both countries.

**Table 21** Descriptives of ANOVA for Gender

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean			
						Lower Bound	Upper Bound	Minimum	Maximum
Trust	Female	79	-.0858901	.97075157	.10921808	-.3033266	.1315464	-2.68537	1.92508
	Male	138	.0491690	1.01657652	.08653674	-.1219515	.2202894	-2.68537	1.93016
	Total	217	.0000000	1.00000000	.06788442	-.1338007	.1338007	-2.68537	1.93016
Intention	Female	79	-.0050333	.97533720	.10973401	-.2234970	.2134303	-1.27388	2.75230
	Male	138	.0028814	1.01735597	.08660309	-.1683703	.1741331	-1.41560	3.57443
	Total	217	.0000000	1.00000000	.06788442	-.1338007	.1338007	-1.41560	3.57443
Perceived	Female	79	-.0306032	.94561471	.10638997	-.2424094	.1812029	-1.20440	3.96016
Usefulness	Male	138	.0175193	1.03280871	.08791852	-.1563336	.1913721	-1.50496	3.96016
	Total	217	.0000000	1.00000000	.06788442	-.1338007	.1338007	-1.50496	3.96016
Perceived	Female	79	-.1143504	.97697371	.10991813	-.3331805	.1044798	-3.41325	1.47431
Ease of Use	Male	138	.0654614	1.01062380	.08603001	-.1046570	.2355799	-2.98558	1.79510
	Total	217	.0000000	1.00000000	.06788442	-.1338007	.1338007	-3.41325	1.79510

*Source: SPSS*

**Table 22 ANOVA Analysis for Gender**

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Trust	Between Groups	.916	1	.916	.916	.340
	Within Groups	215.084	215	1.000		
	Total	216.000	216			
Intention	Between Groups	.003	1	.003	.003	.955
	Within Groups	215.997	215	1.005		
	Total	216.000	216			
Perceived Usefulness	Between Groups	.116	1	.116	.116	.734
	Within Groups	215.884	215	1.004		
	Total	216.000	216			
Perceived Ease of Use	Between Groups	1.624	1	1.624	1.629	.203
	Within Groups	214.376	215	.997		
	Total	216.000	216			

**Source:** SPSS

As the descriptive table of ANOVA analysis presents that the analysis has been carried out for two groups Male and Female. The mean of four main factors have been considered in the analysis such as Trust, Intention, Perceived Usefulness, and Perceived Ease of Use. The ANOVA table shows that F statistics for each factor is below 2 and probability level/ significant level is  $P > .05$ . Thus, the ANOVA analysis is not statistically significant for all factors, which means that there is no difference between the data of male and female. Though there is bit difference of mean and standard deviation between male and female, probably is because of sample size or due to sampling error, the analysis is not significant and it can be concluded that there is no statistically significant difference between the two groups of male and female.

## **5. CONCLUSION**

Chapter five concludes the research by making discussions based on TAM and Trust. This chapter also has made some recommendations for the banking sector and future researchers. Finally, it has discussed the implication and limitation of the research.

According to the Banks Association of Turkey analysis, total number of internet banking users in Turkey was approximately 20 million at the end of 2016 which was only half of it in 2006. The current number of mobile banking users in Turkey is around 19 million. Nonetheless, they did not mention whether the mobile banking customers are using apps or SMS banking.

Banks in Turkey have already introduced mobile banking apps for their clients and customers are accepting this mobile banking service. The research has been conducted to find out what factors are influencing banking clients, especially the young people to adopt mobile banking apps. The purpose of this research is also to suggest an extension of TAM model with Trust in a wider way that jointly predicts user acceptance of mobile banking apps in Turkey. A sample survey from non-users to users of mobile banking apps was conducted both in Turkey to empirically examine this research model. There are several new findings regarding the roles of Trust and TAM in mobile banking apps as discussed previously.

### **5.1 Discussion based on TAM**

From technology acceptance model, it has been found that perceived usefulness (PU) has positive influence on intention to adopt mobile banking apps in which means, the existing and potential customers of the mobile banking apps in Turkey believe that the mobile banking apps will increase their job performance such as saving time for doing banking transaction. The result of perceived usefulness from this study also supports the previous study's results about internet banking as well mobile banking (Akturan & Tezcan, 2012)(Cheng et al., 2006)(I. L. Wu & Chen, 2005)(Safeena et al., 2013)(Daud et al., 2011)(S. et al., 2016). Additionally, it has been obtained from the study that perceived ease of use has positive impact on perceived usefulness and trust to adopt mobile banking apps in Turkey, which means banking consumers in Turkey believe that using mobile banking apps would

be free of effort. In other words, they perhaps believe that using mobile banking apps does not require technology know-how or effort for doing banking transaction through mobile banking apps. Thus, this perceived ease of use (PEU) factor has impact on mobile banking apps adoption by both Turkish banking customers.

Traditionally, TAM mainly focuses on the aspect of system features and thus, is insufficient in capturing the roles of individuals, organizational members, and social system in the applications-based system usage particularly mobile banking apps or internet banking. Trust will be in a complementary manner to enhance the prediction capability of TAM.

## **5.2 Discussion based Trust**

For Trust, the result has found the trust is statistically significant and does have influence on intention to adopt mobile banking application among young people in Turkey which has supported the second hypothesis of the study. Trust result from the study explains that banking clients have faith on the mobile banking application. That explains that mobile applications clients perceive the mobile baking application is trustworthy and clients are willing to accept the technology for their banking activities.

## **5.3 Discussion Based on ANOVA**

ANOVA analysis has been carried out for the genders. The mean of four main factors have been considered in the analysis such as Perceived Usefulness (PU), Trust (T), Perceived Ease of Use (PEU), and Intention (INT). The ANOVA table shows that F statistics for each factor is below 2 and probability level/ significant level is  $P > .05$  for genders. Thus, it can be concluded that there is no statistically significant difference between the two group of genders.

## **5.4 Implication of the Research and Recommendation**

In short, through factor analysis and structural equation modeling (SEM), the findings revealed that the factor Perceived Usefulness has positive influence on Intention to adopt mobile banking applications. Additionally, Trust also has positive influence on Intention to adopt mobile banking applications. Furthermore, Perceived Ease of Use not only



has positive influence on the Perceived Usefulness, but also on Trust. Therefore, Perceived Ease of Use affects Intention to adopt mobile banking applications through these factors. Moreover, no statistically significant differences were found by ANOVA between males and females with respect to the factors investigated and Intention to adopt mobile banking applications.

The results of this study will have imperative implications and is thought to be useful for the Turkish banking sector and also helped for the government, since both will be aware of the relatively important elements that should be considered in formulating appropriate strategies to promote mobile banking services through application, and to obtain the benefits of the system. The most important implication of mobile banking application is the need to recognize that technology acceptance should be accomplished with the purposes of creating useful services and a secured system besides confirming that the privacy of users' banking information and transactions are well taken care of. While the explicit essence of the consumer's relationship is to get a useful and efficient service, awareness on how beneficial mobile banking application is to each targeted market segment among existing banking customers is also an essential aspect. Banks should be promoting their services continuously and in order to attract more customers to adopt mobile banking apps. Moreover, the research can also be used for further research as a reference for developing better mobile banking apps in Turkey keeping in mind that perceived usefulness, perceived ease of use, and trust are main factors for mobile banking apps adoption.

Here are some recommendations for Turkish and Lithuanian mobile banking/internet banking sector:

- All banks should try to create a faithful environment for their potential mobile banking apps users by disclosing information and updating a secure application system. Additionally, banks should make more promotion and advertisement by providing the beneficial information and explaining the advantages of usage of mobile banking apps. Thus, users would be able to share their good experience with their friends and family.
- The mobile banking application should be user friendly or banks may use

advertisements on how to use the apps for better performances and proper steps should be taken by the banking sector to make their customers believe that mobile banking apps are user friendly and ease to use.

- Central Bank of the Republic of Turkey should encourage all commercial banks to offer mobile banking applications services for their clients so that their customers will believe in the service and adopt mobile banking apps quickly.

### **5.5 Limitation of the Study and Suggestions for the Future Researcher**

The data has been collected from Eskisehir in Turkey and the sample size was only 217 to represent the Turkish's banking clients' intention to adopt mobile banking apps. If more data could have been collected from other cities of Turkey, the research would be more comprehensive and accurate. Maximum numbers of the participants were students in these study; therefore, the research has a limited number of participants from other age groups and professions and their perception about mobile banking application in Turkey. This study was conducted to find the factors influencing adoption of mobile banking apps services. Finally, the research only focuses on experienced users or users who adopted mobile banking application service. Since mobile banking apps is relatively new in Turkey and has less research on it, more investigations and researches are needed in this field. Future researchers in Turkey can focus on the satisfaction level of users of Mobile Banking Applications. They may also study the risk perception of the mobile banking application, since the application is based on mobile device and internet.

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## **APPENDICES**

### **Appendix A. Acronyms**

- a) ATT: attitude
- b) PBC: Perceived Behavioral Control
- c) PEOU: Perceived Ease of Use
- d) PU: Perceived Usefulness
- e) S: Supported
- f) SEM: Structure Equation Model
- g) SN: Subjective Norms
- h) NS: Not Supported
- i) T: Trust
- j) TAM: Technology Acceptance Model
- k) TPB: Theory of Planned Behavior
- l) TRA: Theory of Reasoned Action
- m) BI: Behavioral Intention
- n) TRA: Theory of Reasoned Action
- o) ATB: Attitude Toward Performing the Behavior
- p) EFA: Exploratory Factor Analysis
- q) CFA: Confirmatory Factor Analysis
- r) CR: Composite Reliability
- s) CA: Cronbach Alpha
- t) AVE: Average Variance Extracted
- u) MSV: Maximum Shared Variance

## Appendix B. Questionnaire

### Survey Questionnaire for collecting data about Mobile Banking Apps

Dear participants, Thanks for your valuable time and filling up the survey. The collected data will be used for a research work about Mobile Banking Applications in Turkey.

#### Questionnaire

##### Personal Information

##### **Name and Surname:**

Gender:	Female Male
Age:	Less than 18 years old 18-28 years old 28-38 years old 38-48 years old Older than 48 years old
Education:	High school College Bachelor Master or more
Occupation:	Government employee Private sector Student Other

**Please select the appropriate responses that best describe your perceptions of Mobile Banking Apps**

		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
INT1	I have interest to use Mobile Banking Apps.	1	2	3	4	5
INT2	I plan to use Mobile Banking Apps.	1	2	3	4	5
INT3	May be, I'll use Mobile Banking Apps in future.	1	2	3	4	5
INT4	I am determined to use Mobile Banking Apps.	1	2	3	4	5
T1	The Mobile Apps for Banking is trustworthy.	1	2	3	4	5
T2	I trust in the benefits of the Mobile Apps for Banking.	1	2	3	4	5
T3	Mobile Apps for Banking keeps its promises and commitments.	1	2	3	4	5
T4	Mobile Apps for Banking keeps customers' best interests in mind.	1	2	3	4	5
PU1	Using the Mobile Banking Apps improves my performance of banking activities.	1	2	3	4	5
PU2	Using the Mobile Banking Apps makes it convenient to do my banking activities.	1	2	3	4	5
PU3	Using the Mobile Banking Apps enables me to accomplish banking activities more quickly.	1	2	3	4	5
PU4	Using Mobile Apps would increase the quality or output of banking transaction.	1	2	3	4	5
PEU1	My interaction with the Mobile Banking Apps is clear and understandable.	1	2	3	4	5
PEU2	Interaction with Mobile Banking Apps does not require a lot of mental effort.	1	2	3	4	5
PEU3	Mobile banking apps is simple to use.	1	2	3	4	5





### Communalities

		Extraction
INT1	1.000	.658
INT2	1.000	.785
INT3	1.000	.704
INT4	1.000	.786
T1	1.000	.680
T2	1.000	.714
T3	1.000	.661
T4	1.000	.639
PU1	1.000	.580
PU2	1.000	.824
PU3	1.000	.832
PU4	1.000	.688
PEU1	1.000	.744
PEU2	1.000	.853
PEU3	1.000	.676

Extraction Method:

Principal Component

Analysis.

**Reproduced Correlations**

	INT1	INT2	INT3	INT4	T1	T2	T3	T4	PU1	PU2	PU3	PU4	PEU1	PEU2	PEU3	
Reproduced	INT1	.658 <sup>a</sup>	.716	.654	.714	.478	.568	.347	.297	.366	.364	.379	.417	.420	.331	.324
Correlation	INT2	.716	.785 <sup>a</sup>	.727	.784	.503	.605	.372	.311	.425	.453	.470	.481	.461	.370	.379
	INT3	.654	.727	.704 <sup>a</sup>	.725	.360	.474	.236	.168	.346	.424	.446	.396	.365	.321	.330
	INT4	.714	.784	.725	.786 <sup>a</sup>	.504	.613	.387	.320	.440	.466	.484	.482	.494	.413	.414
	T1	.478	.503	.360	.504	.680 <sup>a</sup>	.673	.618	.616	.468	.337	.325	.524	.494	.286	.318
	T2	.568	.605	.474	.613	.673	.714 <sup>a</sup>	.618	.585	.501	.385	.383	.520	.595	.438	.433
	T3	.347	.372	.236	.387	.618	.618	.661 <sup>a</sup>	.639	.532	.417	.405	.525	.583	.424	.455
	T4	.297	.311	.168	.320	.616	.585	.639	.639 <sup>a</sup>	.480	.347	.329	.500	.497	.305	.351
	PU1	.366	.425	.346	.440	.468	.501	.532	.480	.580 <sup>a</sup>	.626	.623	.591	.519	.406	.502
	PU2	.364	.453	.424	.466	.337	.385	.417	.347	.626	.824 <sup>a</sup>	.827	.671	.428	.338	.514
	PU3	.379	.470	.446	.484	.325	.383	.405	.329	.623	.827	.832 <sup>a</sup>	.661	.438	.362	.529
	PU4	.417	.481	.396	.482	.524	.520	.525	.500	.591	.671	.661	.688 <sup>a</sup>	.403	.210	.376
	PEU1	.420	.461	.365	.494	.494	.595	.583	.497	.519	.428	.438	.403	.744 <sup>a</sup>	.735	.664
	PEU2	.331	.370	.321	.413	.286	.438	.424	.305	.406	.338	.362	.210	.735	.853 <sup>a</sup>	.712
	PEU3	.324	.379	.330	.414	.318	.433	.455	.351	.502	.514	.529	.376	.664	.712	.676 <sup>a</sup>
Residual <sup>b</sup>	INT1		-.063	-.149	-.068	-.064	-.047	-.018	.014	.037	.009	-.018	.019	.012	-.017	.027
	INT2	-.063		-.079	-.060	.027	-.051	.003	-.007	.001	-.025	.004	.006	-.020	.000	.038
	INT3	-.149	-.079		-.048	-.042	-.006	.061	.104	-.044	-.010	.020	-.033	.021	.001	-.048
	INT4	-.068	-.060	-.048		-.033	-.030	.014	.027	.053	-.011	-.025	-.012	-.034	.000	-.002
	T1	-.064	.027	-.042	-.033		-.029	-.116	-.140	-.023	.031	.027	-.033	-.017	.010	.073
	T2	-.047	-.051	-.006	-.030	-.029		-.026	-.097	-.029	.066	.022	-.049	-.037	-.006	-.005
	T3	-.018	.003	.061	.014	-.116	-.026		-.108	-.077	.017	.026	-.034	.001	.002	-.091
	T4	.014	-.007	.104	.027	-.140	-.097	-.108		.000	-.036	.013	-.049	-.061	.002	.046
	PU1	.037	.001	-.044	.053	-.023	-.029	-.077	.000		-.059	-.086	-.116	-.050	-.022	-.012
	PU2	.009	-.025	-.010	-.011	.031	.066	.017	-.036	-.059		-.071	-.067	-.002	.023	-.047
	PU3	-.018	.004	.020	-.025	.027	.022	.026	.013	-.086	-.071		-.064	.017	-.008	-.024
	PU4	.019	.006	-.033	-.012	-.033	-.049	-.034	-.049	-.116	-.067	-.064		.068	.066	-.015
	PEU1	.012	-.020	.021	-.034	-.017	-.037	.001	-.061	-.050	-.002	.017	.068		-.056	-.125
	PEU2	-.017	.000	.001	.000	.010	-.006	.002	.002	-.022	.023	-.008	.066	-.056		-.125
	PEU3	.027	.038	-.048	-.002	.073	-.005	-.091	.046	-.012	-.047	-.024	-.015	-.125	-.125	

Extraction Method: Principal Component Analysis.

a. Reproduced communalities

b. Residuals are computed between observed and reproduced correlations. There are 31 (29.0%) nonredundant residuals with absolute values greater than 0.05.

### Structure Matrix

	Component			
	1	2	3	4
INT1	.418	-.806		
INT2	.432	-.883	-.464	
INT3		-.827	-.429	
INT4	.437	-.879	-.477	.434
T1	.796	-.528		
T2	.755	-.648	-.411	.484
T3	.782		-.464	.494
T4	.792			
PU1	.559	-.426	-.688	.481
PU2		-.460	-.905	.417
PU3		-.481	-.905	.440
PU4	.603	-.492	-.749	
PEU1	.590	-.476	-.442	.807
PEU2				.920
PEU3			-.536	.789

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser

Normalization.

### Component Correlation Matrix

Component	1	2	3	4
1	1.000	-.426	-.424	.400
2	-.426	1.000	.465	-.396
3	-.424	.465	1.000	-.414
4	.400	-.396	-.414	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalization.

## Appendix D. Structural Equation Modeling (Confirmatory Factor Analysis)

### Notes for Model (Default model)

#### Computation of degrees of freedom (Default model)

Number of distinct sample moments: 120  
 Number of distinct parameters to be estimated: 34  
 Degrees of freedom (120 - 34): 86

#### Result (Default model)

Minimum was achieved  
 Chi-square = 219.477  
 Degrees of freedom = 86  
 Probability level = .000

#### Estimates (Group number 1 - Default model)

##### Scalar Estimates (Group number 1 - Default model)

##### Maximum Likelihood Estimates

##### Regression Weights: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
PerceivedU <--- PerceivedEOU	.719	.094	7.629	***	
Trust <--- PerceivedEOU	.701	.095	7.394	***	
Intention <--- PerceivedU	.448	.105	4.263	***	
Intention <--- Trust	.762	.140	5.458	***	
PU4 <--- PerceivedU	1.000				
PU3 <--- PerceivedU	1.143	.099	11.566	***	
PU2 <--- PerceivedU	1.013	.087	11.595	***	
PU1 <--- PerceivedU	.910	.098	9.289	***	
PEU3 <--- PerceivedEOU	1.000				
PEU2 <--- PerceivedEOU	1.141	.116	9.822	***	
PEU1 <--- PerceivedEOU	1.218	.113	10.799	***	
T4 <--- Trust	1.000				
T3 <--- Trust	1.193	.140	8.549	***	
T2 <--- Trust	1.407	.149	9.446	***	
T1 <--- Trust	1.260	.145	8.669	***	
INT1 <--- Intention	1.000				
INT2 <--- Intention	1.072	.088	12.226	***	
INT3 <--- Intention	.870	.081	10.703	***	
INT4 <--- Intention	1.107	.089	12.495	***	

**Standardized Regression Weights: (Group number 1 - Default model)**

		Estimate
PerceivedU	<--- PerceivedEOU	.712
Trust	<--- PerceivedEOU	.799
Intention	<--- PerceivedU	.342
Intention	<--- Trust	.506
PU4	<--- PerceivedU	.715
PU3	<--- PerceivedU	.851
PU2	<--- PerceivedU	.854
PU1	<--- PerceivedU	.674
PEU3	<--- PerceivedEOU	.702
PEU2	<--- PerceivedEOU	.745
PEU1	<--- PerceivedEOU	.841
T4	<--- Trust	.624
T3	<--- Trust	.722
T2	<--- Trust	.842
T1	<--- Trust	.736
INT1	<--- Intention	.737
INT2	<--- Intention	.848
INT3	<--- Intention	.745
INT4	<--- Intention	.869

**Variances: (Group number 1 - Default model)**

	Estimate	S.E.	C.R.	P	Label
R2	.489	.088	5.584	***	
R1	.246	.048	5.157	***	
R3	.136	.034	4.019	***	
R4	.369	.068	5.433	***	
e4	.478	.053	9.032	***	
e3	.247	.036	6.836	***	
e2	.189	.028	6.753	***	
e1	.498	.053	9.316	***	
e7	.502	.057	8.823	***	
e6	.510	.061	8.361	***	
e5	.301	.046	6.475	***	
e11	.591	.063	9.429	***	
e10	.492	.056	8.724	***	
e9	.305	.046	6.629	***	

	Estimate	S.E.	C.R.	P	Label
e8	.506	.059	8.574	***	
e12	.719	.080	9.008	***	
e13	.383	.052	7.316	***	
e14	.520	.058	8.942	***	
e15	.340	.051	6.718	***	

**Squared Multiple Correlations: (Group number 1 - Default model)**

	Estimate
PerceivedEOU	.000
Trust	.638
PerceivedU	.506
Intention	.569
INT4	.756
INT3	.555
INT2	.720
INT1	.544
T1	.542
T2	.709
T3	.521
T4	.389
PEU1	.707
PEU2	.555
PEU3	.493
PU1	.454
PU2	.730
PU3	.725
PU4	.511

**Model Fit Summary  
CMIN**

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	34	219.477	86	.000	2.552
Saturated model	120	.000	0		
Independence model	15	1947.530	105	.000	18.548

**RMR, GFI**

Model	RMR	GFI	AGFI	PGFI
Default model	.072	.885	.840	.635
Saturated model	.000	1.000		
Independence model	.475	.251	.144	.220

**Baseline Comparisons**

Model	NFI	RFI	IFI	TLI	CFI
	Delta1	rho1	Delta2	rho2	
Default model	.887	.862	.928	.912	.928
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

**Parsimony-Adjusted Measures**

Model	PRATIO	PNFI	PCFI
Default model	.819	.727	.760
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

**NCP**

Model	NCP	LO 90	HI 90
Default model	133.477	93.562	181.074
Saturated model	.000	.000	.000
Independence model	1842.530	1702.966	1989.473

**FMIN**

Model	FMIN	F0	LO 90	HI 90
Default model	1.016	.618	.433	.838
Saturated model	.000	.000	.000	.000
Independence model	9.016	8.530	7.884	9.211

**RMSEA**

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.085	.071	.099	.000
Independence model	.285	.274	.296	.000

**AIC**

Model	AIC	BCC	BIC	CAIC
Default model	287.477	292.917	402.393	436.393
Saturated model	240.000	259.200	645.588	765.588
Independence model	1977.530	1979.930	2028.229	2043.229

**ECVI**

Model	ECVI	LO 90	HI 90	MECVI
Default model	1.331	1.146	1.551	1.356
Saturated model	1.111	1.111	1.111	1.200
Independence model	9.155	8.509	9.836	9.166

**HOELTER**

Model	HOELTER .05	HOELTER .01
Default model	107	118
Independence model	15	16



## Appendix E. ANOVA Analysis Based on Gender

### Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Trust	.424	1	215	.515
Intention	.018	1	215	.894
Perceived Usefulness	.767	1	215	.382
Perceived Ease of Use	.694	1	215	.406

### Robust Tests of Equality of Means

		Statistic <sup>a</sup>	df1	df2	Sig.
Trust	Brown-Forsythe	.939	1	168.799	.334
Intention	Brown-Forsythe	.003	1	168.260	.955
Perceived Usefulness	Brown-Forsythe	.122	1	174.560	.728
Perceived Ease of Use	Brown-Forsythe	1.659	1	167.126	.199

a. Asymptotically F distributed.