REPUBLIC OF TURKEY
BAHCESEHIR UNIVERSITY

ADOPTION OF MOBILE BANKING IN TURKEY

Master's Thesis

NAZLI ÖZGE ÖZDEMİR

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REPUBLIC OF TURKEY
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MASTERS OF MARKETING

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Thesis Supervisor: ASSIST. PROF. GÜLBERK GÜLTEKİN SALMAN

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ACKNOWLEDGEMENTS

It was a spring day when I came across with a plain tiger butterfly. He was flying freely and magnificently with his tremendous orange, white and black colors. The moment when we both stopped nearby a shrubbery is one of the most remarkable memories in my life. I watched him for a long time. He made me feel good, he inspired me and he gave meaning to my life. He touched my feelings, made me gain a different lens to perceive the ambient and in a way he innovated my life. Guy Kawasaki states that "Great Innovation is motivated by the desire to make meaning that is to change the world." I would like to thank the plain tiger butterfly that fly by desire to make meaning for our lives and to innovate the world. And I would like to thank all people (who I have met or who I have not met yet) who made, make or will make me feel same as the plain tiger butterfly does.

ÖZET

TÜRKİYE'DE MOBİL BANKACILIĞIN BENİMSENMESİ

Nazlı Özge Özdemir

Pazarlama

Tez Danışmanı: Yrd. Doç. Dr.,Gülberk Gültekin Salman

Ağustos 2014, 85 sayfa

Son dönemde mobil teknolojilerdeki ve mobil cihazlardaki gelişmeler hem tüketicileri hem de ürün veya hizmet sunan çoğu sektörü etkilemiştir. Bankacılık sektörü de bu akımdan etkilenmiş ve mobil bankacılık hizmeti sunmaya başlamıştır. Türkiye'deki bankalar da yaptıkları inovasyonlarla mobil bankacılık alanında müşterilerine hizmet vermektedir. Bu çalışmanın amacı inovasyon difüzyon modelleri kullanılarak oluşturulan model çerçevesinde inovasyon özeliklerinden göreceli avantaj, gözlemlenebilirlik, karmaşıklık, uyumluluk, imaj, maliyet, kişisel yaratıcılık ve risk faktörleri ile demografik özelliklerin mobil bankacılığın Türkiye'deki banka müşterilerince benimsenmesi üzerindeki etkisini incelemektir.

Literatür taramasında ilk olarak elektronik bankacılığın tanımı açıklanmış ve elektronik bankacılığın alt kümelerini oluşturan internet bankacılığı ve mobil bankacılık uygulamaları incelenmiştir. Sonraki bölümde inovasyon difüzyon modelleri tanıtılmıştır. Son olarak yapılan analizin sonuçları paylaşılmıştır.

Anahtar Kelimeler: Mobil Bankacılık, İnovasyon, Difüzyon Modelleri

ABSTRACT

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Latest developments in mobile technologies and mobile devices have influenced both consumers and most of the sectors. Banking sector has also affected from the new era of mobile and start to provide mobile banking services. Banks in Turkey also provide mobile banking services to their customers through the innovations they have made. The aim of this dissertation is to examine the influence of demographic factors and the factors of innovation diffusion models that are relative advantage, observability, complexity, compatibility, image, cost and risk over the adoption of mobile banking by the baking customers in Turkey.

Literature review firstly defines the electronic banking and focuses on its components Internet banking and mobile banking services. The next section introduces the diffusion innovation models. Lastly the results of the survey have been depicted.

Key Words: Mobile Banking, Innovation, Diffusion Models

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ABBREVIATIONS

IT: Information Technology

SMS: Short Message Service

WWW: World Wide Web

PDA: Personal Digital Assistants

GPS: Global Positioning System

ATM: Automated Teller Machine

TV: Television

NFC: Near Field Communication

U.S.: United States

WAP: Wireless Application Protocol

PIN: Postal Index Number

GSM: Global System for Mobile

GPRS : General Packet Radio Service

POS: Point of Service

TPB: Theory of Planned Behavior

TRA: Theory of Reasoned Action

TAM:Technology Acceptance Model

TTF: Task-technology Fit

UTAUT: Unified Theory of Acceptance and Use of Technology

1. INTRODUCTION

Evolution of wireless internet and the mobile devices have changed the lives of customers. Mobile phones, smartphones and tablets which are the most common mobile devices have made it possible to benefit messaging, watching videos, films, serials, using internet, banking services, shopping, listening to music on mobile (Cruz 2010). Technological developments and the mobile world have influenced many sectors including banking sector. Banks all around the world are giving importance to investing on Information Technologies (IT) and with the help of wireless internet connections and mobile devices, continuous innovations are being made in order to provide better services to the customers (Crabbe et.al. 2009). Mobile banking is the most recent banking service which provides customers the advantage of conducting banking transactions via mobile devices instead of going to the physical bank branches and instead of using internet banking that requires wired internet connection. Mobile banking allows customers to do many of the banking transactions from checking their accounts, transferring money to paying bills and managing their savings (Sulaiman et. al. 2007). Efma Mobile Banking Report (2014) defines mobile banking as the most disruptive innovation, and classifies the mobile banking services in three parts which are alert services mainly sending SMS, a mobile portal which refers to WAP and mobile applications that customer can download to their mobile devices. However, mobile banking is seen as an infant banking service yet, despite the increasing usage of mobile services all around the world at last years (Efma Mobile Banking Report 2014). Banks in Turkey also provide mobile banking services. And by the usage of smartphones and tablets by Turkish consumers, the mobile banking channel have started to provide more innovative banking services in Turkey due to the necessity of meeting the changing demands of customers and due to the intensive competition in the Turkish banking sector. This dissertation examines the latest innovation in the banking sector that is mobile banking and the elements influencing the adoption of mobile banking by Turkish banking customers. The theoretical model of the dissertation uses the traditional innovation diffusion and adoption theories which include the critical factors relative advantage, observability, complexity, compatibility, personal innovativeness, cost, image and risk.

This dissertation includes the research questions below:

i. What are the factors that influence banking customers' acceptance and adoption of mobile banking?

ii. How do the demographic characteristics of the individuals affect the acceptance and adoption of mobile banking?

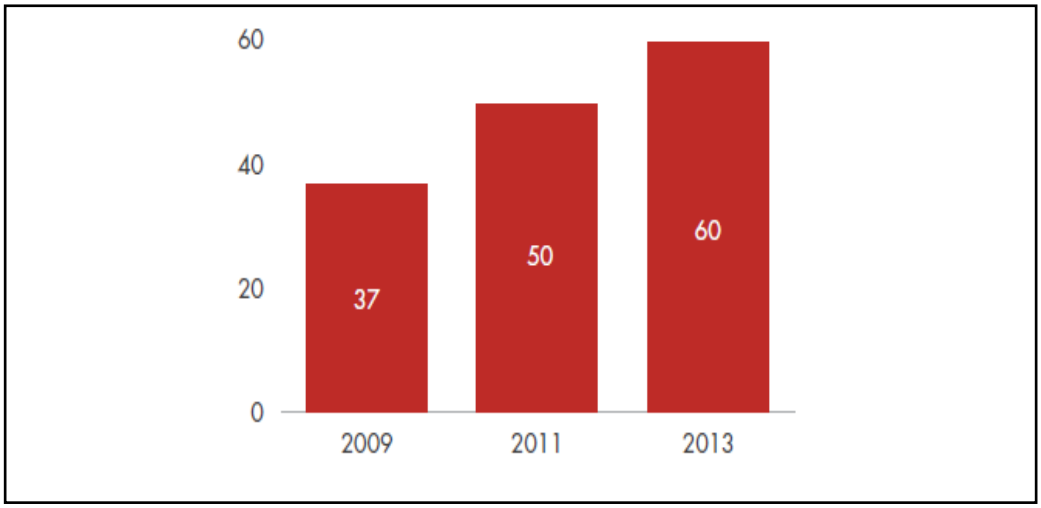
2. LITERATURE REVIEW

2.1 ELECTRONIC BANKING

Innovation has become an indispensable element of businesses including banking sector. Increasing competition in banking sector due to the new players in the sector and dynamic needs and wants of consumers due to the new technological developments force banks to put weight on their innovation facilities in order to keep safe their market share and to conduct their business successfully for an extended period of time.

Over the last years more and more banks internalize innovation and constitute innovation strategy. Because having an innovation strategy enables banks to use its resources efficiently and help to focus on the most beneficial innovation among the variety of innovation types. Figure 2.1 shows the percentage of banks with an innovation strategy. The table states the increase in innovation percentage through years (Efma Report Innovation in Retail Banking 2013 p.14).

Figure 2.1: Percentage of banks with an innovation strategy

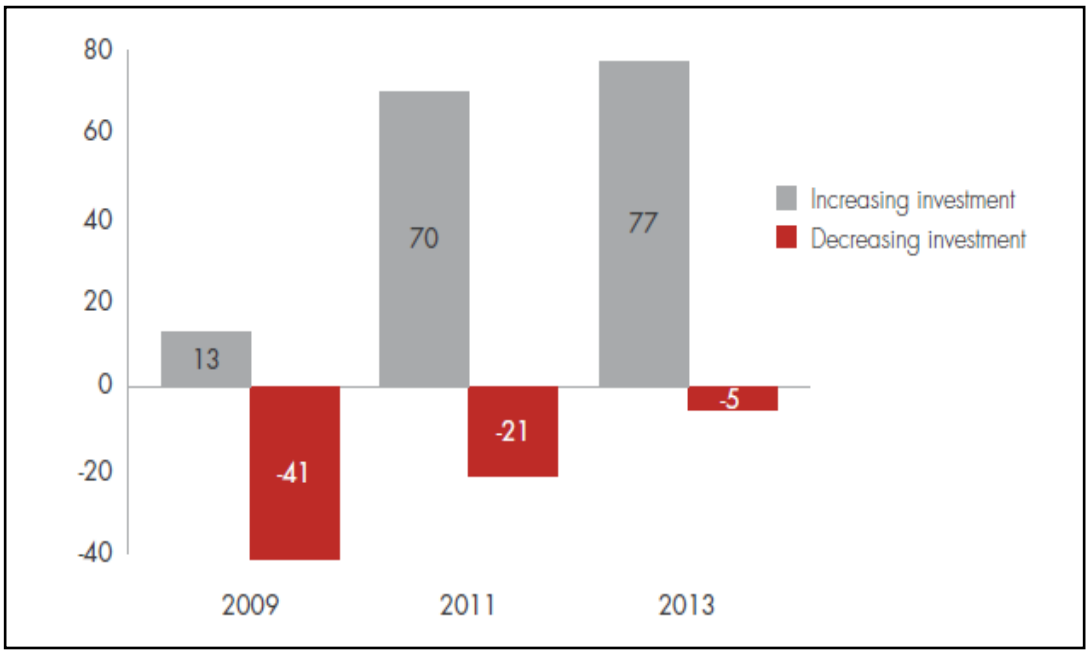


Source: Efma Report Innovation in Retail Banking 2013 p.14

How important the innovation for banks can be understood from the increasing investment on innovation. According to the Efma report 77 percent of banks are increasing innovation investment, and only 5 percent of banks are decreasing innovation

investment in 2013.Figure 2.2 shows the percentage of banks increasing or decreasing innovation investment (Efma Report Innovation in Retail Banking 2013 p.15).

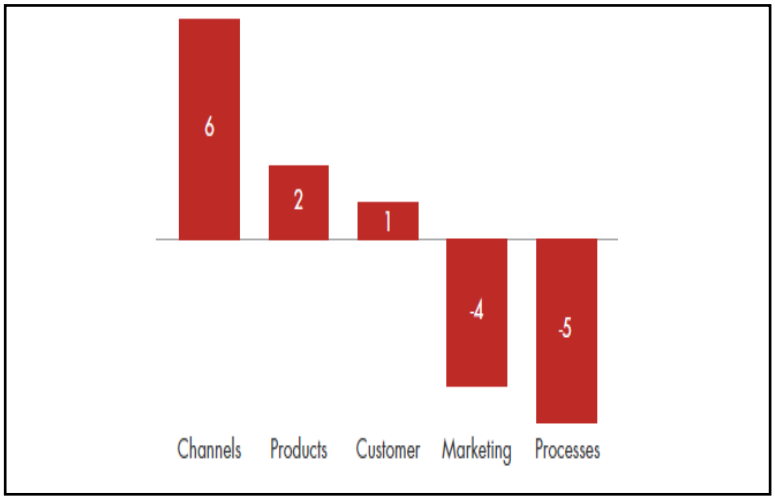
Figure 2.2: Percentage of banks increasing or decreasing innovation investment



Source: Efma Report Innovation in Retail Banking 2013 p.14

When the innovation area is considered it is revealed that banks are more innovative in channels than products, customer, marketing and processes. Figure 2.3 shows the variance from average innovation performance (the average performance score is measured on a scale of 1 to 7) in each area. According to the Efma research innovation in channels has the highest positive variance and innovation in processes has the highest negative variance, meaning that banks do not feel that process innovation is a strong area for them (Efma Report Innovation in Retail Banking 2013 p.16).

Figure 2.3: Variance in innovation performance by area



Source: Efma Report Innovation in Retail Banking 2013 p.14

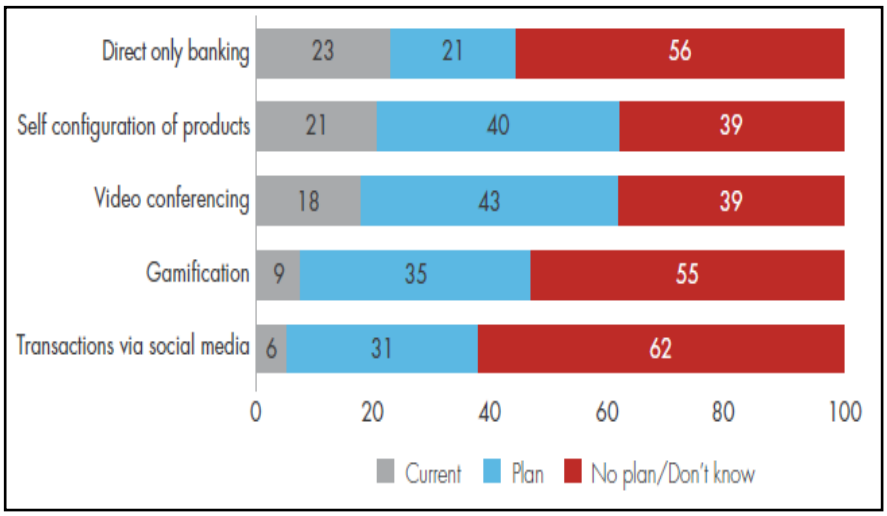
Consequently, penetration of the information technology in the banking sector has transformed banking activities into digitized and automated form (Bradley & Steward 2002). Introduction of internet have also contributed to the improvements in the financial services (Minakakis and Rao1999). These technological innovations have led to a competitive environment in the financial sector and as a result banks have had to develop new delivery channels for their customers (Daniel 1999). Electronic or online banking has been one of the delivery channels, which makes information about the bank and about its services attainable to the customers on an online platform (Daniel 1999). As the components of electronic banking, development of Internet banking and mobile banking channels have been striking innovations in banking sector.

2.1.1 Internet Banking

"Internet banking allows customers to perform a wide range of banking transactions such as writing checks, paying bills, transferring funds, printing statements, and inquiring about account balances electronically via the bank's web site" (Tan &Teo 2000). In addition to the basic banking transactions via web page, internet banking is also offering innovative solutions to their customers. Direct only banking provides services just online and excludes services that are provided from branches. Self-configuration of products allows customers to design their own product or service basket. Videoconferencing assists to reply customer questions, to do banking transactions or to manage customer complaints. Gamification enables bank customers to

integrate more with the bank through online games and enables customers to feel banking in an entertaining format. Lastly, conducting banking transactions via social media is another new way of internet banking by the rise of social networking trend (Efma Report Innovation in Retail Banking 2013 p.16). Efma report about Innovation in Retail Banking (2013) states that banks are planning to integrate these innovations more into their structures. Figure 2.4 shows that 21 percent of banks have direct only banking, 40 percent of banks have self-configuration of products, 43 percent of banks have video conferencing, 35 percent have gamification, and 31 percent of banks have social media banking in their future plans.

Figure 2.4: Percentage of banks at different stages of deployment



Source: Efma Report Innovation in Retail Banking 2013 p.16

2.1.1.1 Internet banking in Turkey

Internet banking in Turkey has been launched first in 1997 by Is Bank. Then most of the banks such as Garanti Bank, Akbank, YapıKredi Bank, Vakıfbank, Denizbank, HSCB, Finansbank have started to provide internet banking through years (Pala & Kartal 2010). According to the statistics of Turkey's Banks Union customers it is detected that number of individual and corporate customers who login at least once to internet banking is showing an increasing trend through years. By the end of June 2014, more than thirty one million individual and corporate banking customers at least once login to internet banking. When the transactions done via internet banking in Turkey have examined, it is seen that most preferred transactions have been on time deposits

accounts, mutual funds and currency transaction, fund transfers, remittance, payments and credit cards (TBB 2014).

Table 2.1: Number of internet banking customers in Turkey

Number of Internet BankingCustomers in Turkey (millions)							
2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013 June**	**2014 June**
10	12.5	13.3	17.2	19.9	24.8	27,5	31,8

*Source:*TürkiyeBankalarBirliği web site [Access date 24 August 2014]

2.1.2 Mobile Banking

Evolution of wireless internet, cell phones, personal digital assistants (PDAs), smartphones, tablets and accordingly mobile services have brought a new phase to the life of consumers. After the introduction of handheld mobile phone in 1973, through years belonging a mobile device has become important for consumers and mobile device owners have increased in the world. Now, mobile devices have become the most crucial communication tools that have wide range of services from text messaging, multimedia, commerce activities, web browsing, social media activities, several downloaded mobile applications to financial transactions in both developed and high-growth economies (Nielsen 2013, p.2).

Technological developments of wireless Internet and mobile devices have created the mobile environment. Then the mobile world has transformed the consumers into mobile consumers due to the attractive mobile services. The perception of the customers have changed by the attractive mobile services that are provided by the other industries, so, customers also expect banks to generate mobile solutions to the current banking services. Accordingly, new needs and habits of mobile consumers have influenced banking sector and the electronic banking channel have had to progress in mobile banking in order to meet the new demands of the banking customers and in order to meet the opportunities presented by this new era. Although responding to the mobile environment's changes quickly is not always possible, banks put the innovation in their agendas since the innovation taking place in retail banking is being driven by the move to mobile. So, banks give weight developing mobile banking services to their customers

in order to take a good positioning in this dynamic environment (Efma Mobile Banking Report, 2014).

2.1.2.1 Components of mobile world

Before going deep into the mobile banking services, this part of the research provides an overlook to the mobile world in terms of mobile devices, wireless services, mobile marketing, mobile penetration trends, mobile consumers and mobile trends.

2.1.2.1.1 *Mobile devices*

After mobile phones the story of the mobile devices continues with PDAs that allow web browsing and obtain location based weather reports and traffic reports. The next mobile device has have more improved location based services including finding friends and guiding for restaurants due to the usage of GPS. The launch of smartphone: iPhone in 2007 has been a disruptive effect on the mobile world (Kaplan 2012). Technological innovation from mobile phone to smartphones has provided many service opportunities to the consumers. In addition to the features of talking, messaging, and taking photographs of the classical mobile phones, smartphones have started to provide internet access, sending e-mails, benefiting mobile applications, watching videos, films, playing games etc. Furthermore, mobile usage of social networking sites through applications such as Facebook, Twitter, Flickr, and YouTube have become an indispensible part of mobile consumers' lives (Persaud&Azhar 2012). After the launch of tablets as mobile devices, a new wave of wearable technology is hitting the mobile device market. Activity, sports and health trackers, smart glasses, smart watches, and smart clothing are the next big thing in consumer electronics.[1]

2.1.2.1.2 *Features of mobile wireless services*

Mobile services provided by these mobile devices have features such as mobility, reachability, localization and personalization that are specific to wireless services. Mobility allows users to receive any information any time independent of location.

[1] ABI research technology market intelligence, 2014, Wearables and Smart Accessories, https://www.abiresearch.com/market-research/service/mobile-device-accessories/ .[Access date 01 May 2014]

Reachability enables both businesses and other people to access users anywhere any time through mobile devices. The location information is a crucial part of the mobile services and users have the opportunity of receiving location based services such as being informed the nearest shops, night clubs or ATM. There are wide variety of services and applications available on the web that is not necessarily interesting for all of the users. So, personalization is an outcome of that situation since users have chance to detect and select the necessary mobile services for them (Siau&Shen 2003).

2.1.2.1.3 *Mobile marketing*

Introduction of mobile devices and these mobile devices' features such as mobility, reachability, localization and personalization have been a new opportunity area for marketers from fashion to finance sector. Mobile marketing, which is defined by Shankar &Balasubramanian (2009) as "the two-or multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device, or technology", has been one of the most important element of the mobile world. As a part of private and social life of consumers, mobile phones have been a marketing channel for marketers (Persaud&Azhar 2012). There are many mobile marketing communication tools. Mobile internet banner ads, mobile search, mobile portal which is a site that is designed to work on mobile phones, mobile TV, mobile radio, scanning: QR codes, advergames which is games to promote a product or brand, sending SMS, MMS, e-mail are some of the communication tools (Leppäniemi&Karjaluoto 2008). Mobile applications are also a communication tool for mobile marketing since they include advertising messages or promotion offers of companies (Cortimiglia 2011).

2.1.2.1.4 *Mobile penetration*

Mobile world's expansion is continuing through the penetration of mobile devices. Usage of mobile phone as a key element of mobile world is increasing through years. According to eMarketer report on the global basis from 2013 to 2017 mobile phone penetration will increase to 69.4 percent from 61.1 percent. In addition to that the adoption of smartphones is also expected to increase through 2017. It is estimated that

on the global basis smartphone users will reach to 1.75 Billion in 2014. Table 2.2 shows the smartphone users and penetration worldwide.[2]

Table 2.2: Smartphone users and penetration worldwide 2012-2017

Smartphone Users and Penetration Worldwide, 2012-2017

	2012	2013	2014	2015	2016	2017
Smartphone users (billions)	**1.13**	**1.43**	**1.75**	**2.03**	**2.28**	**2.50**
—% change	68.4%	27.1%	22.5%	15.9%	12.3%	9.7%
—% of mobile phone users	27.6%	33.0%	38.5%	42.6%	46.1%	48.8%
—% of population	16.0%	20.2%	24.4%	28.0%	31.2%	33.8%

Note: individuals of any age who own at least one smartphone and use the smartphone(s) at least once per month
Source: eMarketer, Dec 2013

Source: eMarketer 2014[3]

High prices of smartphones are perceived as a barrier that prevents people to get in mobile world. And according to the eMarketer report, as the prices of the smartphones are going down, the mobile phone users are showing the tendency to buy smartphones. Moreover, it is mentioned in Mobile World Congress 2014 that industry efforts to introduce a wider range of affordable smartphones. The announcement of $25 smartphone launch plans shows also the importance of reaching emerging markets with low prices (GSMA Intelligence Mobile World Congress 2014). So, with the new attack of low price smartphones, usage of smartphones is expected to grow through years and accordingly mobile world is expected to grow as well.

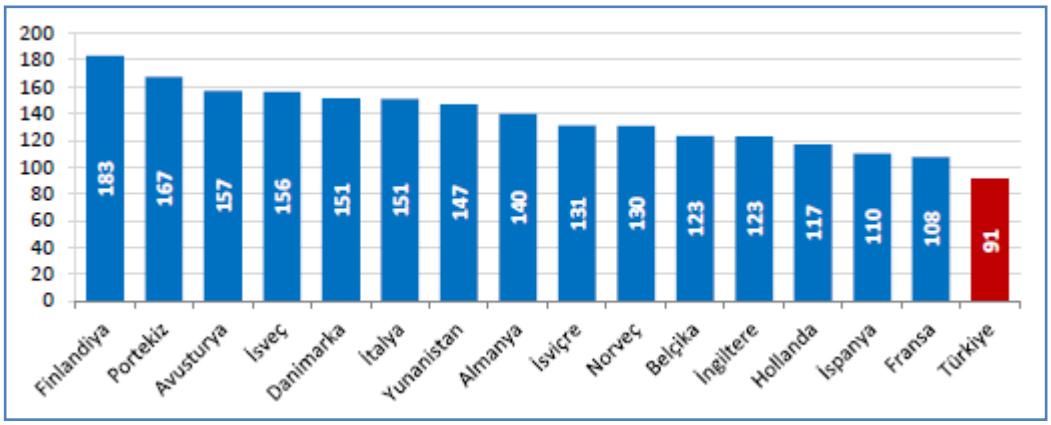
In addition to that the smartphone sales in 2013 are an indicator for the expansion of the mobile world. According to Gartner, Inc[4] smartphone sales have reached more than the half of the total mobile phone sales in 2013. And it is stated in the report that India, China, Latin America, the Middle East and Africa, Asia/Pacific and Eastern Europe

[2]eMarketer, 2014, Smartphone Users Worldwide Will Total 1.75 Billion in 2014 Mobile users pick up smartphones as they become more affordable, 3G and 4G networks advance, http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536.[Access date 01 May 2014].
[3]eMarketer, 2014, Smartphone Users Worldwide Will Total 1.75 Billion in 2014 Mobile users pick up smartphones as they become more affordable, 3G and 4G networks advance, http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536.[Access date 01 May 2014].
[4]Gartner, 2014, Gartner Says Annual Smartphone Sales Surpassed Sales of Feature Phones for the First Time in 2013, http://www.gartner.com/newsroom/id/2665715. [Access date 01 May 2014

have a big contribution to the worldwide sales of smartphones in 2013. Also in Turkey smartphone sales is increasing. GFK report[5] states that Telecom sector in Turkey grew 44 percent in 2013 compared to 2012 by the biggest contribution of smartphone market.

When the mobile penetration is considered on a regional basis in Europe, it is observed that the mobile penetration ratios are high. According to the comparison of Wireless Intelligence report, European countries such as Finland, Portugal, Austria, Sweden and Denmark have the highest mobile penetration ratios. Although Turkey has ranked at the lowest part, it has 90,9 percent mobile penetration in 2013 (BTK 2014, p.37). In addition to that mobile penetration for the first quarter of 2014 has been 91,5 percent.[6]

Figure 2.5: Mobile penetration ratios of some European countries 2013



Source: Wireless Intellegence 2013-4 [Access date 01 May 2014].

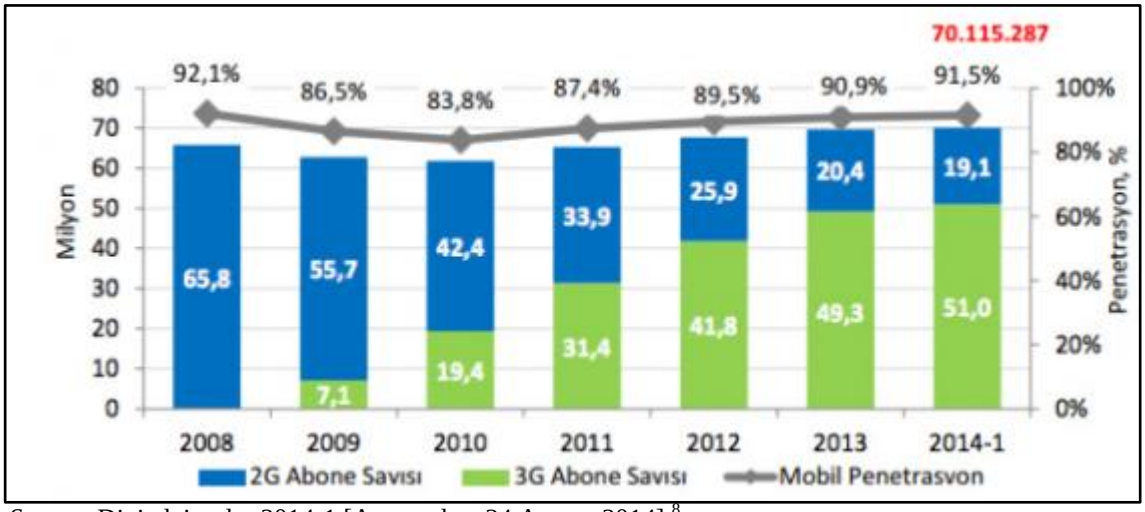
Mobile penetration in Turkey has an increase trend since 2010. By the end of 2014 mobile penetration has reached to 91.5% percent with more than 70 million mobile subscribers. Number of 3G services subscribers is also increasing since the first launch of the 3G services in 2009. By the end of 2014, 3G service users have reached to 51 million in Turkey.[7]

[5] GFK, 2014, 2013 Türkiye TüketiciTeknolojisiÜrünleriPazarı'ndabüyümeyılıoldu, http://www.gfk.com/tr/news-and-events/press-room/press-releases/sayfalar/temax_q4_2013.aspx. [Access date 01 May 2014].

[6]Dijitalajanslar, http://www.dijitalajanslar.com/btk-raporu-turkiyedeki-mobil-abone-sayisi-70-milyonu-gecti/[Access date 24 August 2014]

[7]Türk Telekom, http://www.ttinvestorrelations.com/tr/turk-telekom-grubu/turk-telekoma-yatirim/turkiye-telekom-sektoru.aspx[Access date 24 August 2014].

Figure 2.6: Mobile subscriber numbers and mobile penetration in Turkey



Source: Digitalajanslar 2014-1 [Access date 24 August 2014].[8]

In addition to the increasing penetration rate of mobile phones, mobile internet usage is also increasing through years. eMarketer report states that on the global basis about half of the mobile phone users, will access internet through mobile devices in 2014. As shown in table 2.3, it is estimated that mobile phone users who access internet via mobile phone will reach about to 3 billion people in 2017.[9]

Table 2.3: Mobilephone Internet users and penetration

Mobile Phone Internet Users and Penetration Worldwide, 2012-2017

	2012	2013	2014	2015	2016	2017
Mobile phone internet users (billions)	**1.58**	**1.91**	**2.23**	**2.50**	**2.75**	**2.97**
—% change	37.4%	20.7%	16.5%	12.2%	10.0%	8.0%
—% of mobile users	38.8%	44.1%	48.9%	52.4%	55.5%	57.8%
—% of internet users	66.8%	73.4%	79.1%	83.6%	87.3%	90.1%
—% of population	22.6%	27.0%	31.1%	34.5%	37.5%	40.1%

Note: mobile phone users of any age who access the internet from a mobile browser or an installed application at least once per month; use of SMS/MMS is not considered mobile internet access
Source: eMarketer, Dec 2013

Source: eMarketer 2014[10]

[8]Dijitalajanslar,http://www.dijitalajanslar.com/btk-raporu-turkiyedeki-mobil-abone-sayisi-70-milyonu-gecti/[Access date 24 August 2014]
[9]eMarketer, 2014, Smartphone Users Worldwide Will Total 1.75 Billion in 2014 Mobile users pick up smartphones as they become more affordable, 3G and 4G networks advance, http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536.[Access date 01 May 2014].
[10]eMarketer, 2014, Smartphone Users Worldwide Will Total 1.75 Billion in 2014 Mobile users pick up smartphones as they become more affordable, 3G and 4G networks advance,

Number of 3G services users, mobile phone internet usage and usage amount of mobile internet also has shown an increasing trend through years in Turkey. Number of 3G subscribers has reached to 51 million while internet users via mobile phone have increased to nearly 26,4 million by the end of March 2014.[11]So, both mobile penetration and mobile internet usage are increasing in Turkey which is an indicator for the growth of the mobile in Turkey.

Table 2.4: 3G service subscriber data in Turkey in millions

	2011	**2012**	**2013**	**2014 March**
3G Users	31,4	41,8	49,3	51,0
Mobile phone Internet users	5,0	10,3	22,5	26,4
Amount of mobile Internet Tbyte	10.458	21.590	43.686	52.359

Source: Türk Telekom, [Access date 24 August 2014]

2.1.2.1.5 *Mobile consumers and mobile trends – Nielsen report*

Mobile Consumer Report (2013) of Nielsen brings light to the structure, habits, trends and the differences of the mobile consumers from the different countries of the world such as Australia, Brazil, China, India, Italy, South Korea, Russia, Turkey, the United Kingdom, and the United States.

The report states that penetration rates of mobile devices differ among women and men in all countries named above. It is revealed that users at young ages mostly own smartphones while older users prefer to own mobile phones. The report shows that smartphone ownership increase as the ages go younger in Turkey and the most high smartphone ownership is among users ages 16-24. It is observed that smartphone users in the selected countries mostly play games and use social networking applications. The report have reached the result that text messaging, social networking, mobile applications and web browsing are the most used while mobile shopping, mobile TV and mobile banking are least used mobile features in Turkey (Nielsen 2013).

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http://www.emarketer.com/Article/Smartphone-Users-Worldwide-Will-Total-175-Billion-2014/1010536.[Access date 01 May 2014].

[11]Türk Telekom, http://www.ttinvestorrelations.com/tr/turk-telekom-grubu/turk-telekoma-yatirim/turkiye-telekom-sektoru.aspx[Access date 24 August 2014].

The report states that mobile shopping including mobile payments is not so much preferred by smartphone users. It is revealed that except the U.S. consumers, in other countries smartphone users do not use mobile shopping applications for purchasing. Smartphone users in other countries including Turkey are said to browse to learn about the features and the comments about a product and to compare the prices of the products (Nielsen 2013).

The results coming from the report shows that, applications, sending messages, social networking, and web browsing are mostly selected activities by smartphone users rather than watching videos on smartphones. And it is stated that watching video is not a substitute activity of watching television for the smartphone users who contributed to the research (Nielsen 2013). On the other hand, a research conducted by Strategy Analytics by the contribution of 3.000 mobile consumers has brought out that as the larger the screens of the mobile devices, the more people watch mobile video. And it is stated that more than seventy percent of mobile consumers watch video using their mobile phones (Lomas 2014).

According to the Mobile Consumer report, expansion of mobile world has made marketers to find new communication mediums such as SMS, location-based services, mobile games, mobile video/ radio to transmit their messages to the right customer at right the right time. On the country basis the Nielsen report states that the frequency of receiving mobile advertisements in India is the lowest with less than once a week and Turkey precedes India since 74 percent of users see the advertisements once a day. When the smartphone users are considered, it is observed by the report that Russians receive mobile advertisements via SMS while mobile videos, location-based services, games and mobile radios are the mediums that Chinese receive mobile advertisements.

2.1.2.2 Mobile banking services

Scope of mobile banking services differs for different researchers for the reason of the rapid technological improvements. Lin (2010) states that “Mobile banking (Internet banking using mobile devices, also known as M-Banking, mbanking, SMS Banking etc.) can perform account balances and transaction history inquiries, funds transfers, and bill payments via mobile devices such as cell phones, smartphones, and PDAs (personal

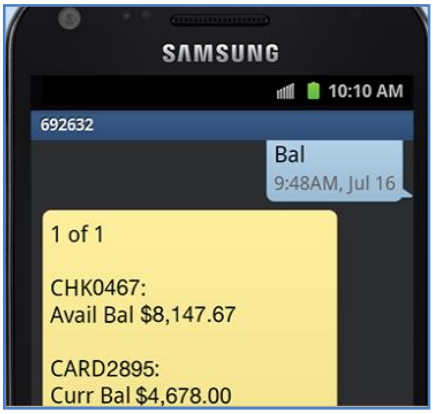
digital assistants)" Crabbe et.al. (2009) defines mobile banking as "the ability to perform banking transactions online on portable mobile devices via Short Messaging Services (SMS) or Wireless Application Protocol (WAP)". Cruz (2010) mentions about mobile banking as "the evolutionary step following the internet banking that provides services, like SMS banking, downloaded applications or direct access to online banking with fewer choices and restricted graphics." The latest Efma mobile banking report (2014) classifies mobile banking services in three parts: alert services (sending SMS), a mobile portal and mobile applications. The next section of the research continues with mobile banking services SMS banking, mbanking, mpayments, WAP banking and mobile banking applications.

2.1.2.2.1 SMS banking

SMS Banking as a subset of mobile banking allows customers to want and get information about their accounts on their mobile phone from their bank with SMS (Short message service). Managing bank accounts, checking accounts, performing check requests and performing other banking transactions via mobilephones are some of the services that SMS banking provides. Push SMS and Pull SMS are designed as the main features of SMS banking. While Push SMS is a one way message that is sent by the bank in order to inform the customer about their accounts for instance deposit alert is an example that bank sends SMS to its customer, Pull SMS is sent by the customer in order to ask for information about his/her account. In this case customer sends SMS to the bank to request information and the bank sends the reply. User's request of his/her bank account balance is an example of SMS banking (Adagunodo et al. 2007). For instance, BaracBank's services are some examples of the Pull an Push SMS services which are instant account balance, fixed deposit maturity alarm, high value transaction alert, account status change alert, welcome alert (for account opening), payment (loan) failure alert.[12]

[12]BracBank, http://www.bracbank.com/SMS-Banking.php. [Access date 01 May 2014].

Figure 2.7: Depiction of SMS Banking



Source: Bank of America website[13]

SMS banking requires PIN code for authorization in every SMS the customer sends to his/her bank. Banks have to secure their systems from unauthorized accesses and from the missing encryptions of the data that is sent by the customers. Due to the technological limitations including the limit of 160 characters, banks are not able to provide all of the banking transactions via SMS banking (Pousttchi&Schurig 2004).

On the other hand advantages of SMS banking can be listed as (i) convenience since it makes users conduct most of their banking transactions without time constraint.(ii) Accessibility is another factor that the users have chance to access his/her banking information without place constraint if there is network coverage on his/her mobile phone. (iii) Portability is feature of SMS banking since banking transactions can be done from any GSM phone. (iv) SMS banking reduces costs of performing banking transactions, and (v) SMS banking provides automatic processing for clients without human hand (Adagunodo et al. 2007). In addition to that, Union Bank of India also promotes the safety and updates advantages. They state that all transactions of SMS banking are intimated to customers (Union Bank of India website 2014).

In Turkey many banks provide SMS banking service for instance, Türkiye Finans Bank provides money transfer, checking account balances, checking credit card balances, currency inquiry and reminder services.[14]Akbank has also a SMS Alert system that functions where expenditures or money transactions exceeds the determined amount. This service tracks credit card expenditures or money in/out's that are over 50 TL, gives

[13] Bank of America, https://www.bankofamerica.com/smallbusiness/online-banking/mobile/text.go. [Access date 01 May 2014].
[14] Türkiye Finans, http://www.turkiyefinans.com.tr/tr/subesiz_bankacilik/sms_subesi/. [Access date 01 May 2014

info about how much money left at the account and tracks credit card expenditures and card limits.[15]Halk Bank[16], Ziraat Bank also provides SMS banking service to their customers.[17]

2.1.2.2.2 *M-banking and m-payments*

M-banking mostly refers to mobile payments services which are a subset of electronic payments (e-payments). "While consumer may initiate and authorize e-payments through a number of other electronic channels such as the internet or card-based acquiring devices like ATMs, mobile payments are made using a mobile device such as a cell phone or PDA. Mobile payments are simply the transference of value from payer to payee, as in a remittance or bill payment" (Porteous 2006).

Report of Porteous (2006) define four different zones for the e-payment services which are based on size of the payments: micro and macro payments and based on the location of the payer relative to payee: remote/far or local/close (Porteous 2006).

Zone 1 includes remote and macro payments that mainly banks provide easy internet access for remittances and for purchasing physical goods through internet. Also non-banks provide online payment services that correspond to the both remote and macro payments including purchases over the internet and person-to-person payments. US-based PayPal is the most famous example of the first zone (Porteous 2006). In addition to that PayPal provides mobile application for smartphones so; it constitutes an example for mobile payment services as well.[18]

Zone 2 includes local and macro payments. In that zone banks provide in store payment services from account to account via point of sale (POS) that enables to pay with credit card in the store (Porteous 2006).

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[15]Akbank, http://www.akbank.com/en/consumer/freedom-banking/Pages/sms-banking.aspx. [Access date 01 May 2014].
[16] Halk Bankası, http://www.halkbank.com.tr/channels/1.asp?id=307. [Access date 01 May 2014].
[17] Ziraat Bankası, http://www.ziraatbank.com.tr/tr/Bireysel/DogrudanBankacilik/Pages/SMSBankaciligi.aspx. [Access date 01 May 2014].

[18]PayPal, https://www.paypal-community.com/t5/PayPal-Forward/bg-p/PPFWD. [Access date 07 May 2014].

Zone 3 includes micro and remote payments andin this zone mobile phones are the main players for the payments. Telecommunication companies provide mobile payment services via mobile devices. And they offer Premium Rated Services (PRS) of which airtime is one of the most common. So, in this zone collection of payments are done by mobile operators using the way of debiting the mobile subscribers' airtime accounts (Porteous 2006).

Mobile payment applications as the most important player of m-banking, which is mentioned at zone 3, have been more beneficial for the users in poorer countries rather than the users in developed world in terms of accessibility and affordability. Countries of developing world such as South Africa, Philippines‘ and Kenya have adopted Premium Rated Services (PRS) such as airtime very successfully (Donner 2007).

The story below stated by Donner (2007) explains the three critical factors of mobile payments systems in the poorer countries: people can keep an amount of asset in an account by the help of mobile phone, people can convert that asset to physical money and people can transfer that asset to other accounts.

Donner (2007, p.4) states in his report:

“Joseph works in a mining town, hundreds of miles from his family in his home village. At the end of each month at the mine, Joseph generally gets paid in cash, and always manages to put some aside, which he wants to send back to his family. So, Joseph visits a local participating mobile shop, perhaps where he bought his mobile to begin with, and signs up for the m-banking/m-payments service on offer by his GSM provider. After signing a few forms, showing some ID (but perhaps not), and executing a few steps on the handset, his account is up and ready to go, but is empty. To ―cash In‖, Joseph hands the money he has set aside to the shop keeper, who takes a small fee, and deposits the rest in Joseph‘s new m-banking/m-payments account. Joseph is allowed to store and send a certain amount in the account linked to his handset, due to banking and anti-money-laundering restrictions, it would not be enough to pay for a car or a home, but he could probably keep a couple weeks‘ wages in the account.

Sending money to his family is then lightning fast, as long as his family is on the same GSM Network. He selects an amount and his mom‘s mobile number, and using only the handset, enters his PIN; the system accepts his transaction and instantaneously sends a SMS alert to his mom‘s handset in the village. Joseph‘s mom can go to her participating corner mobile phone vendor, show the alert SMS, and for a small fee, set up her own m-banking/m-payments account, enter her PIN and ―cash out‖ Joseph‘s transaction. She can elect to keep some of Joseph‘s transfer on her stored value account, and use it to pay bills, send on to other people, or perhaps by airtime down the road. She decides to cash out most of Joseph‘s money (the shopkeeper in the village takes a small percent commission), but saves a little bit, which she uses the next day, to pay her electricity bill.”

Zone 4 includes micro and local payments. In this zone mobile vending and transport applications exist. For instance, when getting products form vending machines mobile phones can be used as payment vehicle or when passing a toll gate, cars with a mobile

device have the opportunity to pass non-stop since the mobile device make payment with sending a signal. As a further example, development of near field communication (NFC) standards also combines mobile phones technology and contactless credit card technology (Porteous 2006).

Digital wallet is a new concept that both encompass zone 1, zone 3and zone 4. Instead of carrying physical cards, people have started to benefit digital wallets which are the mobile applications mostly for smartphones that hold credit card information. For instance, Venmo is a mobile smartphone application that provides money transfers between friends. And it corresponds to zone 1. It requires linking a bank account, debit or credit card to the Venmo account similar to PayPal mobile application. To send money to a friend it is enough to write an email like message to a friend with including the amount of money. It also provides service to share the transaction with a message on social media such as Facebook, Twitter or Foursquare. Google Wallet corresponds to zone 4. It requires linking a debit or credit card to the Google account. After that people do not have to carry any physical card. It realizes the payment activity when the smartphone is waved on the NFC machine, so, the system identifies the credit card information that is linked to the Google account.[19]

In Turkey Turkcell Wallet provides the similar services like as the mobile applications above. It also requires linking a loyalty, debit or credit card to the Turkcell Wallet account. It provides services such as online shopping, money transfers, bill payments and loyalty card usage. Its convergence to zone 3 comes from the services money transfer for the people who do not have Turkcell Wallet account. People without Turkcell Wallet account can withdraw money from the related bank's ATM with the password coming to the mobile phone with SMS. Also this application provides (NFC) near field communication service during payment activity.[20]

Deniz Bank in Turkey also provides fastPay mobile application for the money transfers, online payments and money withdrawals form ATMs. The same steps are followed like the other mobile applications above. However; the credit card to link is required to be

[19]Hongkiat, http://www.hongkiat.com/blog/digital-wallets/ . [Access date 07 May 2014].
[20]Turkcell, http://www.turkcell.com.tr/servisler/turkcell-cuzdan. [Access date 07 May 2014].

Deniz Bank cards. This application also provides to send money to people who are not Deniz Bank customers.[21]

2.1.2.2.3 *Wap banking*

Wireless Application Protocol (WAP) enables internet browsing via mobile devices instead of wired access to internet with desktop computers (Singel´ee&Preneel 2003). WAP is defined as "an industry initiated world standard that allows the presentation and delivery of information and services to wireless devices such as mobile telephones or handheld computers" (Ashley et. Al. 2001). The development of WAP made by Ericsson, Motorola and Nokia which are also called as WAP Forum in order to produce mobile applications and transfer internet contents to mobile devices (Tiwari&Buse 2005).

Evolution of the WAP has integrated into the banking sector as well. Banks also have been using the WAP in order to provide banking services to customers. As a mobile form of internet banking, WAP banking communicates with its customer via mobile devices. WAP banking customers access their banks' WAP related website over the internet from mobile phone browser with a mobile phone that support WAP.[22]To access the internet from mobile phone the customer should have GPRS facility enabled (United Bank of India 2014). GPRS, General Packet Radio Service, allows transmission of data. WAP banking, as a browser-based banking application provides services such as money transfers, bill payments, buying insurance policies (Tiwari&Buse 2005).

In Turkey many banks such as YapıKredi Bank, İş Bank, VakıfBank, Demirbank and Koçbank provide WAP Banking services through websites: http://WAP. Ykb.com, http://WAP.isbank. com.tr, http://WAP.vakifbank. com. tr, http://WAP. demirbank. com.tr since 2000.[23] As the first WAP banking provider in Turkey, Is Bank allows its customers to use the WAP service İşWap, for the transactions of remittance, bill payments, credit card transactions, investment, loans etc.[24]

[21]fastPay, http://www.fastpay.com.tr/#nedir.[Access date 07 May 2014].
[22]Ebanka, http://ebanka.tuke.sk/EN/CLIENT/WB.htm. [Access date 07 May 2014]
[23] NTVMSNBC, http://arsiv.ntvmsnbc.com/news/15156.asp. [Access date 07 May 2014].
[24]İsbank, http://www.isbank.com.tr/TR/aninda-bankacilik/iswap/Sayfalar/iswap.aspx . [Access date 07 May 2014].

Figure 2.8: Depiction of WAP Banking

Source: Is Bank website 2014 [Access date 01 May 2014]

2.1.2.2.4 *Mobile banking applications*

The launch of iPhone in 2008 has triggered off the mobile banking sector in terms of producing mobile applications some of which provide banking services that SMS and WAP banking also have similar services such as checking accounts and transaction histories, money transfers, and bill payments. And also applications that aren't related to financial services are being provided in order to constitute a new channel for contacting customers (Efma Mobile Banking Report p.7). For the financial services ING Bank provides a mobile banking application that is called "small sacrifices" that allows saving money by quitting the unnecessary expenditures as shown in the figure 2.9.[25] Barclays Homeowner application allows customers to calculate borrowing and moving cost of a house when they decide to buy a house, then, the application directs the customers to estate agents and mortgage specialists.[26] In figure 2.10, the illustration of the Homeowner application takes place.

[25]The Financial Brandhttp://thefinancialbrand.com/24723/ing-direct-mobile-banking-savings-application/. [Access date 01 May 2014].
[26] Barclays,http://www.barclays.co.uk/Mortgages/BarclaysHomeownerapp/P1242633411744. [Access date 01 May 2014]

Figure 2.9: Depiction of Small Sacrifices Application

Source: The Financial Brand 2012 [Access date 01 May 2014][27]

Figure 2.10: Depiction of Homeowner Application

Source: Barclays, 2014 [Access date 01 May 2014][28]

[27]The Financial Brandhttp://thefinancialbrand.com/24723/ing-direct-mobile-banking-savings-application/. [Access date 01 May 2014]

[28] Barclays,http://www.barclays.co.uk/Mortgages/BarclaysHomeownerapp/P1242633411744. [Access date 01 May 2014]

2.5.1.1.5 Mobile banking in Turkey

Mobile banking has been launched in 2000 in Turkey.[29] And after being launched mobile banking has gained incremental importance in Turkey. A recent survey by ING found that, in 2013, 49 percent and in 2014, 56 percent of Turkish internet users use mobile banking which is an indicator that mobile banking is a hot topic for Turkish banking customers. This result also make Turkey number one among European countries in terms of mobile banking adoption both in 2013 and in 2014. Because the survey has revealed that for 2014 the adoption rate for Netherlands is 50 percent, for Poland and Spain 48 percent, for UK 38 percent and for Germany 38 percent.[30]

According to the mobile banking statistics that are sent to Turkey's Banks Union, by Akbank, Aktifbank, Denizbank, Finansbank, HSBC Bank, ING Bank, Odea Bank, Şekerbank, TEB, Ziraat Bank, Garanti Bank, Halk Bank, Is Bank, Vakıflar Bank, YapıKredi Bank it is detected that number of customers who login at least once to mobile banking is showing a tremendous increasing trend through years.

Table 2.5: Number of mobile banking customers in Turkey

Number of Mobile Banking Customers in Turkey (millions)			
2011	**2012**	**2013**	**2014 June**
1,2	2,5	5,3	7,5

Source: Türkiye BankalarBirliği (TBB) web site [Access date 24 August 2014][31]

By the end of June 2014, more than seven and half million banking customers at least once login to mobile banking services. The table number 2.5 shows that banking customers who at least once login to mobile banking in Turkey has been increased 112 percent from 2012 to 2013 and has been increased 41 percent from 2013 to June 2014 (TBB 2014).

In addition, Turkey's Banks Unions mobile banking report (2013) states that the volume of investment transactions has reached to 9.4 billion TL by the end of 2013 and the

[29] NTVMSNBC, http://arsiv.ntvmsnbc.com/news/15156.asp. [Access date 07 May 2014].
[30] ING, http://www.ing.com/Newsroom/All-news/NW/Cash-no-longer-king-Mobile-banking-still-rising.htm. [Access date 24 August 2014]
[31] TBB, http://www.tbb.org.tr/tr. [Access date 24 August 2014].

other transactions except investment transactions have reached to 20 billion TL. The same report for 2014 states that the volume of investment transactions has reached to 14.5 billion TL and the other transactions except investment transactions have reached to 32 billion TL in the April-June 2014 period. Hence, it is concluded that mobile banking transactions are showing increasing trend through years. And more and more Turkish banking customers are starting to use mobile banking services. When the transactions done via mobile banking in Turkey have examined, it is seen that paying bills, tax payments, loan payments, credit card application, loan applications currency transaction, fund transfers, remittance have been some of the transactions. And it is also observed that money transfer transactions have constituted the 80 percent of the financial transaction volume except investment transactions (TBB 2014).

As mobile banking customers are increasing and mobile banking services are being improved in Turkey year by year, financial behavior of the banking customers are also changing. ING survey has pointed out that mobile banking customers pay less in cash and they prefer paying with debit and credit cards, direct fund transfers, sending money via SMS and using contactless payment systems. According to the survey results, people in Turkey found to be most likely to be using cash less.[32] Since 2011, Turkish financial sector also have an aim to create "cashless society" until 2023. This idea arises from the technological improvements in payment systems. Contactless payment systems and digital wallets have been the pioneers of this idea.[33] Digital wallets that hold credit card, bank card and loyalty card information basically provide online shopping and money transferring transactions. Since the banking customers do not need to carry any cash, digital wallets are the best vehicles to create cashless society.

Mobile applications of digital wallets such as Turkcell Wallet, BKM Express and PayPal also play very important role on the way to cashless society. Turkcell Wallet includes NFC technologies that provide also contactless payments. While providing such a service, Turkish telecom company Turkcell, at the beginning of this new era have started to work with a partner form Turkish banking sector which is Garanti Bank. In this partnership, Garanti Bank credit card holders have benefited making mobile

[32] ING, http://www.ing.com/Newsroom/All-news/NW/Cash-no-longer-king-Mobile-banking-still-rising.htm. [Access date 24 August 2014]
[33] Milliyet, http://www.milliyet.com.tr/nakitsiz-toplum-icin-dijital-cuzdan-geliyor/ekonomi/ekonomidetay/19.11.2011/1464783/default.htm [Access date 24 August 2014]

contactless payments using their smartphones with NFC feature via Turkcell Wallet. Not only credit cards buts also prepaid cards of Garanti Bank take place in Turkcell Wallet service in the scope of this partnership.[34]By 2013 Turkcell has also started to work with other banks in Turkey which are Yapıkredi Bank and Akbank to serve digital wallet services. And now banking consumers from any bank may benefit this Turkcell Wallet service.[35] So, in this case mobile phone operator Turkcell and Garanti Bank are observed to be leaders in mobile payment technologies in Turkey. And it is obvious that banks and telecom companies both serve for the sake of cashless society and in behalf of mobile banking services. Banks' mobile banking applications are also mediums that make mobile banking customers make payment without using cash. Money transfers from one account to another account and paying with QR codes (Quick Response) are the services that make payments without cash.

Many banks take their place in Turkey to compete in the mobile banking services. Two biggest contributors to the mobile banking services, the mobile banking customer numbers and mobile banking transaction volume can be listed as Is Bank and Garanti Bank that are leaders in private banks in Turkey. Mobile banking application of Is Bank which is İşCep has the motto of "İşCep gives you the advantage of accessing your bank and branch wherever you wish!"[36] As a mobile application İşCep provides services such as "Parakod" which enables making payments with mobile phone at POS machines and at online shopping stores by reading QR (Quick Response) codes with a system that is linked to the credit cards of the customers, withdrawing money from ATMs with the help of QR code, finding the nearest bank branch, bulletin about economics as well as basic banking transactions.[37]

[34] Garanti,http://www.garanti.com.tr/en/our_company/garanti_news/2008/april08/mobile_wallet.page [Access date 24 August 2014]
[35]Telecoms, http://www.telecoms.com/205371/turkcell-inks-mobile-wallet-deal-with-garanti-bank/[Access date 24 August 2014]
[36]İsbank, http://www.isbank.com.tr/EN/personal/instant-banking/iscep/Pages/iscep.aspx. [Access date 10May 2014].
[37]İsbank, http://www.isbank.com.tr/EN/personal/instant-banking/iscep/Pages/iscep.aspx. [Access date 10May 2014].

Figure 2.11: Is Bank mobile banking application

Source: Google Playwebsite[38] [Access date10 May 2014]

In addition to the basic banking transactions, the mobile banking application of Garanti Bank, iGaranti, enables their customers to link their bank account with social networks such as Facebook and Foursquare. With this respect, iGaranti, provides their customers to transfer money to Facebook friends who have the same application. Also with the help of the linkage between Foursquare application and the bank account, if customers using iGaranti application make check-in on Foursquare, receives offers and discount from the nearest shops or restaurants. Also without social network property, "smart offers" option of iGaranti provides incentives for their customers. Lastly, linking credit cards to the iGaranti mobile banking application and making payments with QR code ease the life of customers.[39]

[38] Google Play, https://play.google.com/store/apps/details?id=com.pozitron.iscep. [Access date 10 May 2014]
[39]iGaranti, http://www.igaranti.com.tr/ig. [Access date 10 May 2014]

Figure 2.12: Garanti Bank mobile banking application

Source: Webrazziwebsite[40] [Access date10 May 2014]

One of the participation banks in Turkey which is Türkiye Finans also provides mobile banking application for its customers. TurkiyeFinans mobile banking application distinguish from rivals with the features of user friendly interface, customized mobile branch home page that includes profile picture of the customers, getting the address information with user's camera in addition to the basic mobile banking features.[41]

Another issue that banks in Turkey are paying attention is branchless banking or direct banking. For doing so, banks provide just internet banking and mobile banking services and make their customers abandon branches. YapıKredi Bank's "Nuvo allows customers to open accounts and complete all their transactions via mobile and internet banking, removing the need to ever visit a branch"[42] So, with branchless banking customers benefit mobile shopping and mobile banking due to the release of time and location constraints, due to the competitive interest rates, free account transactions and money transfers, discounts and reduced delivery costs.[43] Similarly, Finansbank in Turkey provide branchless banking service that is called "Enpara". Enpara just provides internet banking and mobile banking services. Customers who have Enpara account are

[40]Webrazzi, http://webrazzi.com/2013/05/09/igaranti-iphone-uygulamasi/. [Access date 10 May 2014]
[41] Pozitron, http://www.pozitron.com/turkiye-finans-is-now-on-android/[Access date 24 August 2014]
[42] Pozitron, http://www.pozitron.com/yapi-kredi-launches-branchless-banking-with-monitise-2/[Access date 24 August 2014]
[43] Pozitron, http://www.pozitron.com/yapi-kredi-launches-branchless-banking-with-monitise-2/[Access date 24 August 2014]

not allowed to make in-branch transactions. It offers high interest rates for savings, provides money transfers for free and does not charge any transaction fee.[44]

2.2 INNOVATION ADOPTION MODELS

Financial sector's heavily dependence on the technological services and products make banks give importance to technological innovations to survive in the competition. As the pursuer of internet banking, mobile banking is a new technological service that banks provide to their customers in order to meet their needs. As an innovation, mobile banking encompasses technology and services together. So, "the innovation of delivering financial services through mobile devices represents a complex interaction between an intangible service and technology based service delivery." (Black et al. 2001, p.390).

While customers are dealing with technology based services and products, the nature of customer-company relations are subject to a transformation (Parasuraman A. 2000). Instead of getting service from employees, customers have started to interact with technology based services (Meuter et al. 2000). Rayport and Sviokla (1994) states that the classical market place shift to the marketspace that is a virtual service area. Rayport and Sviokla's virtual marketspace has also mentioned by Grönrosset. al. (2000, p. 243). as a platform "… *where the content of a transaction is information about goods or services instead of the goods or services themselves, and where the context of a transaction is electronic on screen interactions instead of face to face interactions, and the infrastructure enabling the transaction consist of computers and communication lines instead of physical stores or service organizations.*" When we consider electronic banking and mobile banking, these services are compatible with the concept of marketspace in terms of being technology driven and being lack of firm employee interaction.

Another study that shows the shift from classical services marketing is the pyramid model of Parasuraman (2000). He introduces an extended model of the Kotler's triangle model of services marketing that mentions about the company, employee and customer

[44] Finansbank, http://www.finansbank.enpara.com/#[Access date 24 August 2014]

relations. Since the triangle model is thought to be not capturing the current complexities of services marketing due to the rapid infusion of technology, the pyramid model includes technology dimension in the center of company, employee and customer relations. The pyramid model constitutes links of company-technology, technology-employee, and technology-customer that shows the importance of technology in the services marketing.

Consequently, there have been a shift and customers have started to interact with the marketspace that is a virtual service area instead of interacting with a service firm employee. So, company-technology, technology-employee, and technology-customer relations have gained importance in the services marketing. As a result financial sector's high dependence on technology has showed itself on mobile banking as well. As an innovation, mobile banking represents a complex interaction between an intangible service and technology based service delivery.

Researchers have been studying on the factors that affect the use and adoption of technology based innovative services and products for years in order to find ways to integrate these innovations to the lives of businesses and individuals (Legris, Ingham & Collerette2003). This part of the research gives detailed information about adoption models and theories and factors influencing behavior of individuals when giving decision about adopting or not adopting technological services or products.

2.2.1 Theory of Reasoned Action (TRA)

Ajzen and Fishbein (1980) have developed the theory of reasoned action (TRA). The theory mainly states that attitude of an individual and the subjective norms affect the intention to perform a behavior and the intention of an individual affects his or her actual behavior. Subjective norms refer to a person's perception and consideration of the thoughts of his or her close friends and family when taking a decision of performing or not performing a behavior. In general, the subjective norms can be expressed as the effect of social environment on the behavior of an individual (Ajzen&Fishbein 1980). In this theory there is high correlation between intention and actual behavior (Dishaw&Strong 1998). In other words, actual behavior which is accepting an

innovation depends on the attitudes, subjective norms and intention of an individual in this theory.

2.2.2 The Theory of Planned Behavior (TPB)

The latter theory that comes after the theory of reasoned action (TRA) as an extension of it is the theory of planned behavior (TPB). The theory of planned behavior (TPB) includes perceived behavioral control as a construct besides attitude and subjective norms to understand the behavioral intentions that constitute the actual behavior (Ajzen 1991). The theory proposes that behavior of an individual is at his or her own authority and intention to perform a behavior is determined by behavioral control (Dishaw M. T., Strong D. M. 1999).

2.2.3 Technology Acceptance Model (TAM)

Technology acceptance model (TAM) proposes that two concepts: perceived usefulness and perceived ease of use influence the attitude of an individual to use a product or service, then the attitude influences the intention to use a product or service and finally the intention influences the actual use of a product or service of an individual. (Davis et al. 1989)Perceived Usefulness is defined as "the degree to which an individual believes that using a particular system would enhance his or her job performance." Perceived Ease of use is defined as "the degree to which an individual believes that using a particular system would be free of physical and mental effort" (Davis 1985).

In order to understand more about the user adoption behavior, technology acceptance model have been extended by many researchers. For instance, Venkatesh and Davis (2000) have introduced "TAM2 that encompasses social influence processes, which are subjective norm, voluntariness, and image, and cognitive instrumental processes, which are job relevance, output quality, result demonstrability, and perceived ease of use, as determinants of perceived usefulness and usage intentions"

Another extension of TAM that includes task-technology fit (TTF) constructs such as tool functionality, tool experience and task characteristics is suggested by Dishaw and Strong (1999). They have developed an integrated model by assessing the similarities and differences of TAM and TTF model. TTF model posits that users will choose to use

information technology (IT) only if the IT provides sufficient advantage. It is stated in the research that “adding TTF constructs to TAM explains significantly more of the variance in utilization than either TAM or TTF alone.” (Dishaw& Strong 1999)

2.2.4 Diffusion of Innovation Theory

Diffusion of Innovation Theory, which explains the concepts diffusion, innovation and mentions about the characteristics of adopters, innovation-decision process and attributes of innovation is developed by Rogers (1995). In this theory diffusion is defined as “the process by which an innovation is communicated through certain channels over time among the members of a social system.” (Hoffmann 2011, p.37) So, the main elements in the diffusion of new ideas are stated as “(1) innovation, (2) communication channels, (3) time and (4) social system.”(Rogers 2002)

Innovation, which is defined as “an idea, practice, or object that is perceived as new by an individual or other unit of adoption”, is the main point since the theory proceeds over the question “why certain innovations spread more quickly than others?” (Hoffmann 2011, p.37). According to the theory, spread speed of the innovation, meaning the rate of adoption is determined by the characteristics of an innovation which are relative advantage, compatibility, complexity, trialability, and observability. (Hoffmann 2011, p.37) Rogers’ theory defines “relative advantage as the degree to which an innovation is perceived as better than the idea it set aside, compatibility as the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters, complexity as the degree to which an innovation is perceived as relatively difficult to understand and to use, trialability as the degree to which an innovation may be experimented with on a limited basis, observability as the degree to which the results of an innovation are visible to others“ (Hoffmann 2011, p.42).

Communication channel provides the message to pass from person to person. Mass media channels and interpersonal channels are described as the means that have effect on the decision of accepting or rejecting a new idea (Hoffmann 2011, p.38).

The theory specifies time as a process of innovation diffusion and time relates to diffusion speed and the adoption rate of the innovation (Hoffmann 2011, p.38). The theory indicates that innovation decision process start with (1) the knowledge of an innovation, meaning that an individual learns that there is an innovation and have an understanding about the functions of it (2) then conviction part comes at which a person constitutes an attitude toward the innovation, (3) then decision part comes that the person gets more into thoughts about adopting or rejecting the innovation, (4) implementation of the new idea comes next that the person starts to use the innovation, and (5) confirmation of this decision finalize the innovation decision process (Hoffmann 2011, p.41).

Innovation decision process take place in the social system since people spread an innovation through talking to each other (Rogers 2002). According to Rogers, innovativeness shows if an individual adopt a new idea earlier than other members of a social system or not. Innovativeness consists of different adopter categories, which are: "(1) innovators, (2) early adopters, (3) early majority, (4) late majority, and (5) laggards, due to the personal differences such as (1) socioeconomic status, (2) personality variables, and (3) communication behavior" (Hoffmann 2011, p.45).

2.2.5 Innovation Diffusion Literature

Many researchers have studied and extended the innovation diffusion model and attributes of innovations. Moore and Benbasat (1991) have studied on measuring users' perceptions of adopting an innovation. They have explained that the key point which influences innovation diffusion is not the potential adopters' perceptions of the innovation itself, but rather their perceptions of using the innovation. Their innovation diffusion model introduces image and voluntariness of use, in addition to the classical innovation attributes relative advantage, compatibility, complexity, observability, and trialability. The image construct is mentioned when using and adopting an innovation is thought to improve an adopter's image or status among his or her close friends and family (Moore & Benbasat1991). While Rogers (1995) has defined image as a part of relative advantage, some researchers such as Tornatzky and Klein (1982), have discussed that image is not in the scope of relative advantage and it should be considered as a different factor. The other construct introduced by Moore and Benbasat

is the voluntariness of use that is "the degree to which the use of an innovation is perceived as being voluntary or free will" (Moore &Benbasat 1991).When Moore and Benbasat (1991) introduce the construct voluntariness of use, they wonder whether individuals are free to bring about personal decisions about adoption or rejection. Due to some corporate policies a particular innovation within an organization may be mandated or discouraged, so, freedom of choice of rejection or adoption may be inhibited. So, compulsory versus voluntary adoption is a point of their research. For Moore and Benbasat (1991) an environment is important where a person give the adoption decision voluntarily. Moore and Benbasat (1991) have indicated also the similarity between Technology Acceptance Model and Diffusion of Innovation Theory. It is stated that perceived usefulness and perceived ease of use from TAM are identical with relative advantage and complexity from Roger's Diffusion of Innovation Theory.

Another analysis by Tornatzky and Klein (1982) examines 10 characteristics of innovation which take place in articles they reviewed. The attributes of innovation researched consists of cost, communicability, divisibility, profitability, and social approval in addition to Rogers' five innovation attributes: relative advantage, compatibility, complexity, trialability, and observability. In their discussion, Tornatzky and Klein points out that communicability is closely related to observability, and divisibility to trialability.

Venkateshet. al. (2003) has examined eight technology acceptance models from theory of reasoned action to the innovation diffusion theory in order to constitute a unified model, called the Unified Theory of Acceptance and Use of Technology (UTAUT), that contains constraints: performance expectancy, effort expectancy, social influence and facilitating conditions from the eight models (Venkatesh et.al. 2003).

In performance expectancy an adopter thinks that using the new innovative system will provide improvement in job performance. Performance expectancy is depicted as relevant to relative advantage and usefulness constructs in other innovation diffusion models and theories. Effort expectancy is associated with the ease of use of the system (Venkatesh et.al. 2003). And relative constructs for effort expectancy are depicted as perceived ease of use and complexity. In social influence, a person considers the thoughts of others when giving the decision if he or she should use the innovation and it

is depicted in relation with the constructs subjective norms and image in other theories. Facilitating conditions are defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system” And facilitating conditions capture constructs: perceived behavioral control and compatibility (Venkatesh et.al. 2003).

Agarwa l& Prasad (1998) has also extended technology acceptance model by proposing a new construct personal innovativeness in the domain of information technology. Rogers (1995) defines personal innovativeness as “degree to which an individual is earlier in adopting innovations than others.” However, Agarwal& Prasad (1998) has redefined innovativeness concept and described it as “the individual’s willingness to try a new information technology.”

Lee (2008) has examined positive and negative factors together in order to understand the points that influence online banking adoption. His research includes constructs of technology acceptance model and theory of planned behavior model which are perceived usefulness, perceived ease of use, attitude, perceived benefit, subjective norm, perceived behavior control, intention as well as perceived risk which is conceptualized by Bauer at 1960s (Ostlund 1974). Lee (2008) includes Jacoby, Kaplan and Roselius’ studies on the types of perceived risk which are financial, performance, security/privacy, social and time risk. As a factor that constitute a resistance to the adoption of innovations, perceived risk has more than one definition in literature such as “kind of subjective expected loss” and “the possible loss when pursuing a desired result” (Lee 2008).

2.2.6 Ram &Sheth’s Reverse Innovation Diffusion Model

Ram &Sheth (1989) examines the diffusion of innovation from the reverse angel by their research which is about the customer resistance to innovations. They state that customers resist to the innovation if the innovation creates a change in daily lives of customers and interfere the routine or if it conflicts with belief structure of customers.

Ram &Sheth (1989) introduces characteristics of the innovation resistance. Firstly, they mention that innovation resistance affects the timing of adoption. It is pointed out that

the adopter categories, which are also mentioned by Rogers (1995), innovators, early adopters, early majority, late majority and laggards show different levels of resistance to the innovations. So, the timing of the adoption differs accordingly with the different adopter categories. While adopters show no resistance, diffusion of the innovation takes time for laggards. Secondly, Ram &Sheth (1989) state that the resistance of the innovation varies in degree between passive resistance to the active resistance. Research defines the degrees of the resistance on three categories which are (1) just unwillingness to adopt an innovation, (2) postponing the adoption of innovation on purpose and (3) working against the adoption of innovation by influencing other people negatively. Thirdly, innovation resistance exists across product classes (Ram &Sheth 1989). Ram &Sheth (1989) introduces functional barriers and psychological barriers that hinder customers to adopt innovation. Functional barriers consist of usage, value and risk barriers whereas psychological barriers consist of tradition and image barriers. Usage barrier arises if the innovation is not compatible with the existing habits and requires change in the routine of the customers (Ram &Sheth 1989). This barrier corresponds to the Rogers' constructs of compatibility.

Value barrier occurs if the performance to price of the new product is not strong than the substitutes (Ram &Sheth 1989). Since the performance of the new product is the matter of adoption, value barrier corresponds to Rogers' relative advantage construct. Risk barrier has four main types which are (1) physical risk due to innovation's harm to person or property, (2) economic risk due to the high cost of the innovation, (3) functional risk due to performance uncertainty of innovation and (4) social risk due to not being accepted by peers (Ram &Sheth 1989). Risk barrier overlaps more than one construct from various innovation diffusion models. For instance, functional risk relates to the construct relative advantage from the Rogers' model (1995), economic risk and social risk relates to Tornatzky and Klein's (1982) cost construct and social approval constructs. Also social risk relates to subjective norms constructs in Theory of Reasoned Action (Ajzen and Fishbein 1980) and Theory of Planned Behavior (Dishaw M. T., Strong D. M. 1999).

Tradition barrier occurs when an innovation requires a customer to deviate from the established traditions (Ram &Sheth 1989). So, as Rogers (1995) states if the innovation is not compatible with a customers' past experience, diffusion of innovation gets harder.

Image barrier occurs if the customers do not welcome the product image, company, brand, or country of origin. If customers develop an unfavorable image for the product or service, they resist adopting the innovation (Ram &Sheth 1989).

3. RESEARCH METHODOLOGY

3.1 AIM OF THE STUDY

This dissertation aims to understand the factors influencing the adoption of mobile banking services in Turkey. Two groups of factors have been examined which are critical factors and demographic characteristics. Critical factors stand for the innovation attributes**: relative advantage, observability, complexity** and **compatibility** from Rogers' (1995) Diffusion of Innovation Theory; **cost** construct from Tornatzky and Klein's (1982), **personal innovativeness** construct from Agarwal& Prasad (1998). **image** construct from Moore and Benbasat (1991) and perceived **risk** construct from Sathye (1999). Demographic factors affecting adoption of mobile banking services in Turkey are considered as gender, age, education level, occupation and income level.

3.2 VARIABLES

3.2.1 Relative Advantage

Relative advantage, as an innovation attribute takes place in Rogers' (1995) Diffusion of Innovations Theory. However, in the innovation diffusion literature it takes the name perceived usefulness for the first time in Technology Acceptance Model that is derived by Davis et.al. (1989).As Tan &Teo (2000) mentions relative advantage is one of the most critical factors that determine the adoption of an innovation. Also in literature perceived usefulness and relative advantage have taken place in the analysis of many researchers such as Moore &Benbasat (1991), Agarwal& Prasad (1998) and Gerrard& Cunningham (2003). Rogers (1995) addresses relative advantage as increased efficiency, economic benefits, and enhanced status while Davis (1985) defines perceived usefulness as a belief about using a system will improve performance of a job. In the context of mobile banking services, many advantages are provided to customers that enhance the performance of doing banking transactions and increase these services' efficiency in terms of convenience, time and control. Banking customers who use mobile banking have the chance to reach their bank accounts whenever they want and wherever they want. In addition to that, various banking transactions including money transfers and different payment opportunities improve the life standards of the customers due to the value added relative advantage of mobile banking. So, meeting the

banking needs with the help of mobile devices that are integrated to everyday life of the customers without time and location constructs provides a tremendous advantage to the customers. Hence, relative advantage is considered as an effective factor influencing the adoption of mobile banking in Turkey.

3.2.2 Observability

Rogers defines observability as "the degree to which the results of an innovation are visible to others" (Hoffman 2011, p.42). A point of view declared by Gerrard& Cunningham (2003) presents that it is not possible for Internet Banking customers to show their transaction results to other people. With this respect mobile banking can be assessed as a non-observable banking service by third parties. However, Tornatzky and Klein (1982) converges that observability is closely related to communicability. So, any communication through advertisements including especially TV advertisement about mobile banking and peer experiences create awareness and constitutes visibility about mobile banking. From this aspect, as Moore &Benbasat (1991) states, "the more a potential adopter can see an innovation and the more visible its advantages are, the more likely the innovation is to be adopted." Thus, observability is considered as an effective factor influencing the adoption of mobile banking in Turkey.

3.2.3 Complexity

Complexity appears in the literature as perceived ease of use for the first time in Technology Acceptance Model. After that Rogers (1995) renames it as complexity which is defined as "the degree to which an innovation is perceived as relatively difficult to understand and use." Gerrard& Cunningham (2003), Tan &Teo (2000) Agarwal& Prasad (1998) give place to the concept in their researches. Gerrard& Cunningham (2003) also mentions about different opinions about other researchers including Polatoglu&Ekin (2004) stating as education level increases perceived complexity of an innovation decreases and Black et. al. (2001) stating as the experience with technological devices increase, perceived complexity of an innovation decreases. Hence, complexity is considered as an effective factor influencing the adoption of mobile banking in Turkey.

3.2.4 Compatibility

Perceived compatibility is “the degree to which an innovation fits the values, previous experiences and needs of the potential adopter.” (Rogers 1995).On the reverse case Ram &Sheth’s (1989) mentions that when an innovation requires a customer deviate from the established tradition barrier occurs. So, tradition barrier comes out as a factor inhibiting the adoption of innovation. Tan &Teo (2000) emphasize that widespread usage of Internet and the increasing computer literacy make banking customers be familiar with Internet banking since then; Internet banking becomes compatible with the life style of banking customers and becomes more likely to be adopted. As it is stated in the literature review part increasing penetration rate of mobile phones, mobile internet usage and increasing number of mobile banking customers are indicators of how likely mobile banking is compatible to the values, previous experiences, needs and life style of the potential adopters in Turkey. Similar to research of Lin (2010), this study expects that mobile banking is compatible with banking customers’ lifestyle and preferences, too. Consequently, compatibility is evaluated as an influential factor on the adoption of mobile banking in Turkey

3.2.5 Image

Image construct, which is defined as "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" by Moore &Benbasat (1991), have been a part of many research taking different names such as subjective norm (Ajzen&Fishbein 1980), social approval (Tornatzky& Klein 1982), social risk (Ram &Sheth’s 1989), social influence (Venkatesh et.al. 2003) and perceived elitisation (Crabbe et.al. 2009) in the literature. Although Rogers (1995) considers image as a part of relative advantage in the Diffusion of Innovations theory, as it is stated above many other researchers examine image separately. As Moore &Benbasat (1991) do, in this dissertation image is considered as a separate factor from relative advantage and considered as an important factor affecting the acceptance of innovations.

3.2.6 Risk

Perceived risk comes out frequently in the innovation diffusion and adoption literature as a critical construct that influence adoption of technology based services. Lee (2008) examines risk with its whole components which are financial, performance, security/privacy, social and time risk. Black et al. (2001) states measures of risk as errors and security afforded. Polatoglu&Ekin (2004) associates financial, physical, or social risk with trying an innovation. Sathye (1999) handles risk as security and reliability of transactions in the context of Internet banking. This dissertation examines the risk construct from security point of view similar to Sathye (1999). Security risk corresponds to potential loss due to "fraud or a hacker compromises the security" of a bank account, and also acquiring "sensitive information, such as usernames, passwords and credit card details" are the subject of security risk (Lee 2008). Hence, considering mobile banking adoption in Turkey, perceived risk is considered as an effective factor influencing the acceptance of this technology based banking service.

3.2.7 Personal Innovativeness

Rogers (1995) emphasizes that personal characteristics have great effect on the decision of adopting or rejecting innovation, so, innovativeness as a personal characteristic is depicted as an indicator to adopt an innovation earlier than others. Innovators, early adopters, early majority and laggards are also mentioned as adopter categories which arise from personal differences (Hoffman 2011, p. 45). Agarwal and Prasad (1998) also explain that "individuals, who have high innovativeness, are more likely to develop positive perceptions towards the innovation and they are more eager to use it." Personal innovativeness is utilized by Agarwal and Prasad (1998) as "the individual's willingness to try a new information technology" as well. So, in this context, personal innovativeness is taken as an important factor that affects the adoption of mobile banking.

3.2.8 Cost

Electronic banking services including Internet banking and mobile banking are pointed out as cost effective services since then, they provide banking services affordable than the other banking channels (Crabbe et.al. 2009). Polatoglu&Ekin (2004) also mentions that use of nonbranch channels by banking customers reduces the workload of the branches and relatively transaction costs decrease and become advantageous for the

customers. Rogers (1995) also considers cost under as relative advantage since the innovation provides saving for the adopter. Similarly, Gerrard& Cunningham (2003) name this construct as economic benefits. On the other hand Ram &Sheth (1989) calls the construct as economic risk from the reverse angel due to the high cost of the innovation. From the point of view of Ram &Sheth (1989), an issue comes out as a costly side of mobile banking which is cost of Internet usage in order to access mobile banking service. Tornatzky and Klein (1982) consider cost as a separate factor from the advantage side. In this dissertation cost is considered also as a separate factor. As Cruz (2010) explains in his research cost is a crucial factor in the adoption of mobile services. Cruz (2010) also mentions about the fees charged for using mobile banking services including "mobile operator charge" which is referred as Internet access. Thus, cost is evaluated as an influential factor on the adoption of mobile banking in Turkey.

3.2.9 Demographic Characteristics

Adopter categories give an insight for explaining the innovation diffusion rate and accordingly innovativeness of people (Rogers 1995). When the different aspects of early adopters are examined, it is claimed by Rogers that "relatively earlier adopters in a social system are no different from later adopters in age" (Hoffmann 2011, p.44). On the other hand, Venkatesh& Morris (2000) state the different adoption behaviors of older and younger adopters. So, age is perceived as an influential factor in this dissertation.

Another claim of Rogers is presented about the education level, occupations and status. It is stated that "the relatively early adopters have more years of formal education, are more likely to be literate, and have higher social status and occupations" (Hoffmann 2011, p.44). So, education level, occupation and income level have also considered as influential on adoption of mobile banking services in this research. Additionally, gender factor is tested in order to examine if there is an influence of gender on the adoption of mobile banking.

3.3 RESEARCH QUESTIONS

This dissertation includes the research questions below:

i. How do the critical factors influence banking customers' acceptance and adoption of mobile banking?

Does relative advantage of mobile banking services influence mobile banking adoption?

Does observability of mobile banking services influence mobile banking adoption?

Does complexity of mobile banking services influence mobile banking adoption?

Does compatibility of mobile banking services influence mobile banking adoption?

Does image influence mobile banking adoption?

Does risk influence mobile banking adoption?

Does personal innovativeness influence mobile banking adoption?

Does cost influence mobile banking adoption?

ii. How do the demographic characteristics of the individuals affect the acceptance and adoption of mobile banking?

Does gender of the individuals influence mobile banking adoption?

Does age of the individuals influence mobile banking adoption?

Does education level of the individuals influence mobile banking adoption?

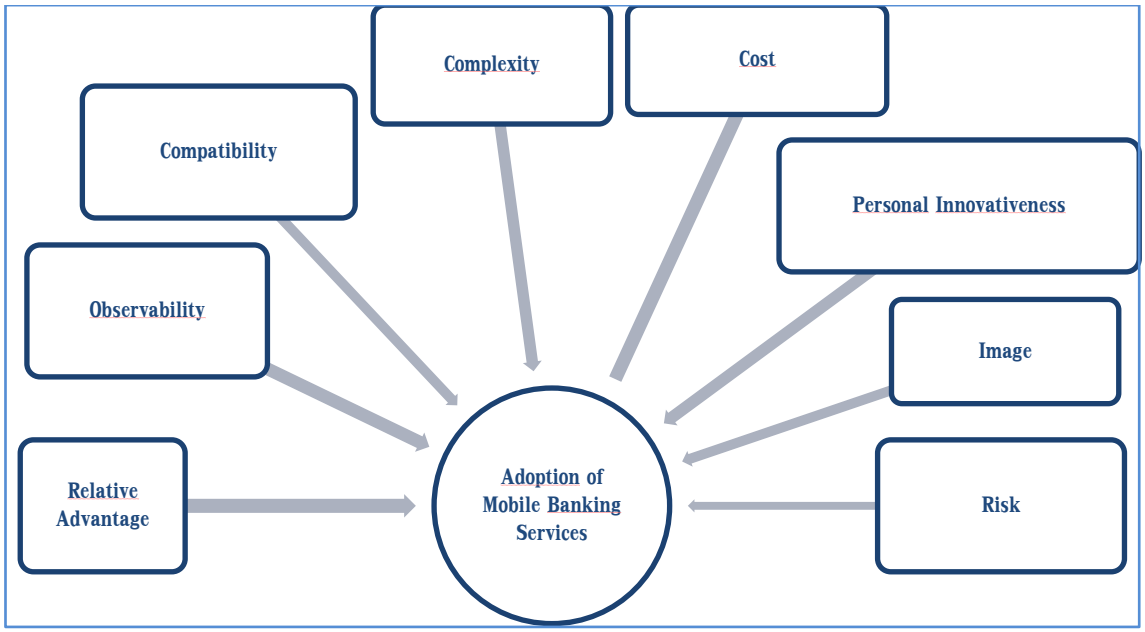
Does occupation of the individuals influence mobile banking adoption?

Does income level of the individuals influence mobile banking adoption?

3.4 RESEARCH MODEL AND HYPOTHESES

This dissertation covers the critical factors relative advantage, observability, compatibility, complexity, cost, personal innovativeness, image and risk as the research model. In addition to the critical factors also demographic factors gender, age, education level, occupation and income level have been examined to understand if they have influence on the adoption of mobile banking. Figure 3.1 illustrates the research model while the hypotheses are listed below.

Figure 3.1: Research Model



H1: Relative advantage of mobile banking services has an influence on mobile banking adoption.

H2: Observability of mobile banking services has an influence on mobile banking adoption.

H3: Complexity of mobile banking services has an influence on mobile banking adoption.

H4: Compatibility of mobile banking services has an influence on mobile banking adoption.

H5: Image has an influence on mobile banking adoption.

H6: Risk has an influence on mobile banking adoption.

H7: Personal innovativeness has an influence on mobile banking adoption.

H8: Cost has an influence on mobile banking adoption.

H9: Gender of the individuals has an influence on Mobile Banking adoption.

H10: Age of the individuals of has an influence on Mobile Banking adoption.

H11: Education level of the individuals of has an influence on Mobile Banking adoption.

H12: Occupation of the individuals of has an influence on Mobile Banking adoption.

H13: Income level of the individuals of has an influence on Mobile Banking adoption.

4. STATISTICS

In this dissertation two basic research approaches which are qualitative research and quantitative research have been considered and one of them has been chosen in order to design the research. Since the dissertation examines the mobile banking and the elements influencing the adoption of mobile banking by Turkish banking customers, it probes individual views. Both qualitative and quantitative researchers seek for the views of individual with different methods. Qualitative research tries to understand the background of the participants by receiving information personally with the help of researcher who then interprets the findings. Qualitative research derives information from individual experiences through narrative design, and open-ended interviewing. (Creswell 2003).According to Carr (1994) qualitative research requires an interactive relationship between researcher and the respondent. This feature both constitutes advantage and disadvantage for the research. Spending vast of time with respondent may encourage the respondent to be valid and honest while time itself can be another constraint for the research. Also there is risk for researcher to develop empathy for the participant and lose the conscious of being a researcher resulting subjective results. (Carr 1994). Different form the qualitative research, quantitative research basically tests hypotheses and collect data through experiments and surveys to accept or reject the hypotheses with the help of objective statistical analyses (Creswell 2003). Carr (1994) defines quantitative research as "an objective, formal, systematic process in which numerical data are used to quantify or measure phenomena and produce findings. It describes tests and examines cause and effect relationships and test theory deductively from existing knowledge, through developing hypothesized relationships." So, when both qualitative and quantitative researches are examined, the quantitative research and applying survey is found to be more appropriate for this dissertation due to the reason that the dissertation tests hypothesis for the factors influencing adoption of mobile banking, due to the objectivity concern and due to the time constraint.

4.1 DATA COLLECTION METHOD

In order to find answers to the research questions a survey has been applied for the banking customers who use or not use mobile banking services. Two different methods

have been conducted for two different groups to collect data. The survey has been sent to a group of mobile banking users via e-mail. And the survey has been given to banking customers who do not use mobile banking face to face. The aim of this differentiation was that mobile banking users are assumed to be more integrated in internet and technology while nonusers are assumed to be not interested in technology and internet. The mobile banking users who received e-mail have been asked in the e-mail text to send the e-mail to other people who use mobile banking services as well. One e-mail address is given to return the answers. And the nonusers are also asked to give the survey other banking customers who do not use mobile banking services.

4.1.1 Data Collection Tools and Design

Closed questions which are binary questions, categorical questions, check list, ranking questions, continuous questions and Likert scale are included in the survey. The aim of the survey has been explained and instructions are given to the respondents to answer the questions. Questionnaire starts with the questions probing the usage habits of mobile banking services. The second part includes questions about critical factors that constitute research model. Second part asks questions about relative advantage, observability, complexity, compatibility, cost, personal innovativeness, image and risk. The third part includes questions about gender, ages, education level, occupation and income level. Research model questions are listed below.

Table 4.1: Research Model Questions

Critical Factors	Research Model	Questions and Question Numbers	References
Observability	**Rogers (1995)**	**1.** I have seen/ heard about others using mobile banking services	adapted from Moore &Benbasat (1991), Cruz (2010)
		2. I am aware of the advantages of mobile banking services	
		18.I am aware of the disadvantages of mobile banking services	
Relative Advantage		**17.**Using Mobile Banking enables me to do my daily transactions more quickly than other banking channels	adapted from Agarwal& Prasad (1997), Cruz (2010), Suoranta (2003), Gerrard& Cunningham (2003), Moore &Benbasat (1991)
		4.Using Mobile Banking makes me do my daily transactions more easily than other banking channels	
		5.Using Mobile Banking makes me do my daily transactions regardless of time	
		19. Using Mobile Banking makes me do my daily transactions regardless of place	
		6.Overall, I find mobile banking services are advant0ageous	
Complexity		**3.**Mobile banking is a complicated service technologically	adapted from Agarwal& Prasad (1997), Cruz (2010)
		9.It is easy to learn mobile banking services	
		14. It is not easy to use mobile banking services	
Compatibility		**8.**Mobile banking is compatible with my lifestyle	adapted from Tan&Teo (2000)
		11. Using mobile banking fits well with the way I like to manage banking transactions	
Risk	**Sathye (1991)**	**21.**I am worried about others to access my bank accounts due to the usage of mobile banking	adapted from Tan&Teo (2000)
		15.I am confident over the security aspects of mobile banking	
Cost	**Tornatzky& Klein (1982)**	**20.**The mobile internet service is expensive to use mobile banking services	adapted from Cruz (2010), Gerrard& Cunningham (2003)
		7. Mobile banking charge lower transaction fees than other banking channels	
Image	**Moore and Benbasat (1991)**	**12.**People who use mobile banking services are more prestigious	adapted from Moore &Benbasat (1991)
		10. Using mobile banking services is a status symbol	
Personal Innovativeness	**Agarwal& Prasad (1998)**	**16.**I do not like changes from the usual way I do things	adapted from Gerrard& Cunningham (2003), Agarwal& Prasad (1998)
		13. Among my peers, I am usually the first to try out new information/communication technologies	

4.2 SAMPLING METHOD

Choosing a sample is an important step in conducting a research in order to eliminate the inefficiency of studying whole population. “The aim of all quantitative sampling approaches is to draw a representative sample from the population, so that the results of studying the sample can then be generalized back to the population” (Marshall 1996).

Sampling comprise of a process that initiates with the definition of the target population (Malhotra& Birks 2000, p.358). In this dissertation, to test the hypothesis introduced above, a survey conducted among banking customers who work in İstanbul in Turkey. 100 working banking customers, including private sector, public sector and self-employed, who use or not use mobile banking have contributed to the survey. After defining the target population, choosing the sampling technique follows. There are two kinds of sampling techniques which are probability that applies random selection, and nonprobability that does not apply random selection due to the hardness to reach the population. In this dissertation nonprobability snowball sampling technique is applied. Snowball sampling requires one respondent to direct the researcher to the others who are in the same target population. In other words referrals of participants make sample grow. Also by the help of referrals this technique helps to reveal hidden populations who are not visible in the society, since people who know each other trigger the population (Faugier&Sargeant 1996). So, in order to reach both mobile banking user and nonusers snowball sampling technique is used. According to Bartlett et. al. (2001) it is convenient to select minimum five observations for each independent variable. Since the research contains thirteen independent variables the sample constitutes more than 65 observations which is multiplication of 5 and 13.

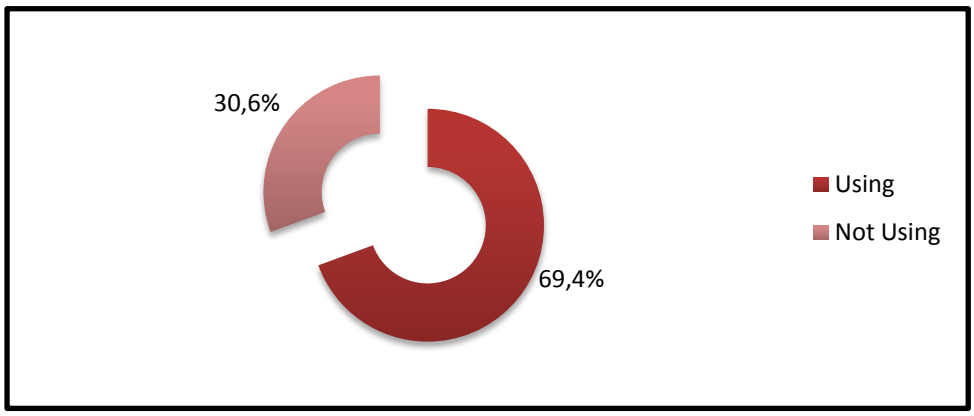
4.3 DATA ANALYSES

In order to give start to the analyses firstly recoding has been applied for the negative questions in the survey, then the outlier data cleaning has been implemented (Altunışık et al. 2005, p. 143). After data cleaning two respondents have been excluded from the research due to the inappropriate z-score. The analyses have kept on by 98 respondents. The following data analysis part of the survey summarizes the adoption criteria of the respondents towards mobile banking services. Firstly, usage habits of mobile banking services, reasons for not using mobile banking services will be exhibited. Then the critical factors affecting the adoption of the mobile banking will be analyzed in detail. Lastly, the characteristics of the respondents will be analyzed through demographic controls: gender, ages, education level, occupation and income level

4.3.1 Mobile Banking Usage Habits

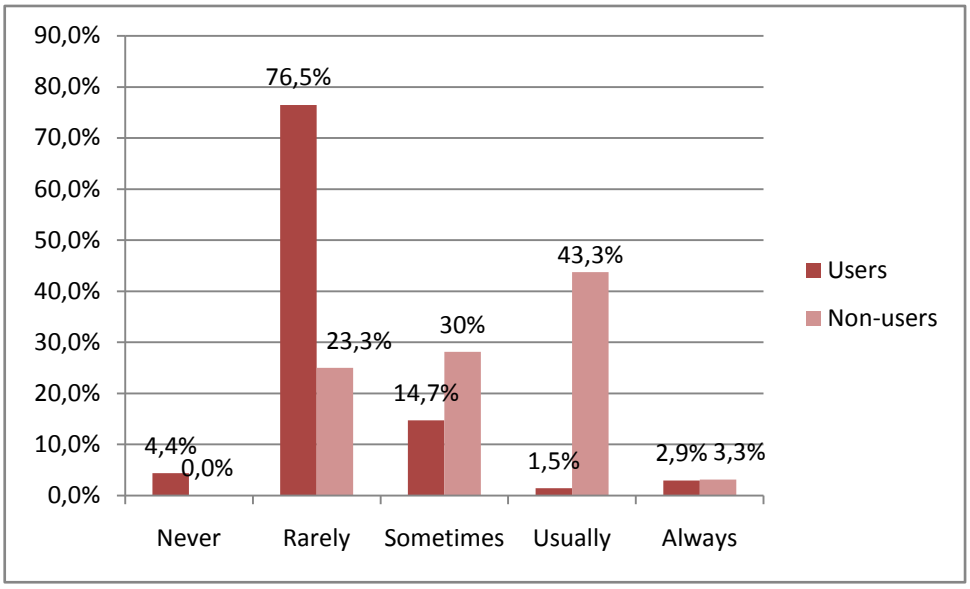
It is resulted that 30 respondents do not use mobile banking while 68 respondents use mobile banking services. The overall frequencies show that 69 percent of the respondents are already benefiting mobile banking services while 31 percent of the respondents do not use mobile banking. In addition to that, respondents who do not use mobile banking services have adoption intention towards mobile banking services corresponding to 57 percent of the total respondents who do not use mobile banking services currently. Also, all of the respondents have answered the question how they learned about mobile banking. The results have revealed that most of the respondents have heard about mobile banking "from peers". The second and third answers have arisen as "from advertisements" and "from bank personnel".

Figure 4.1: Mobile banking usages percentage



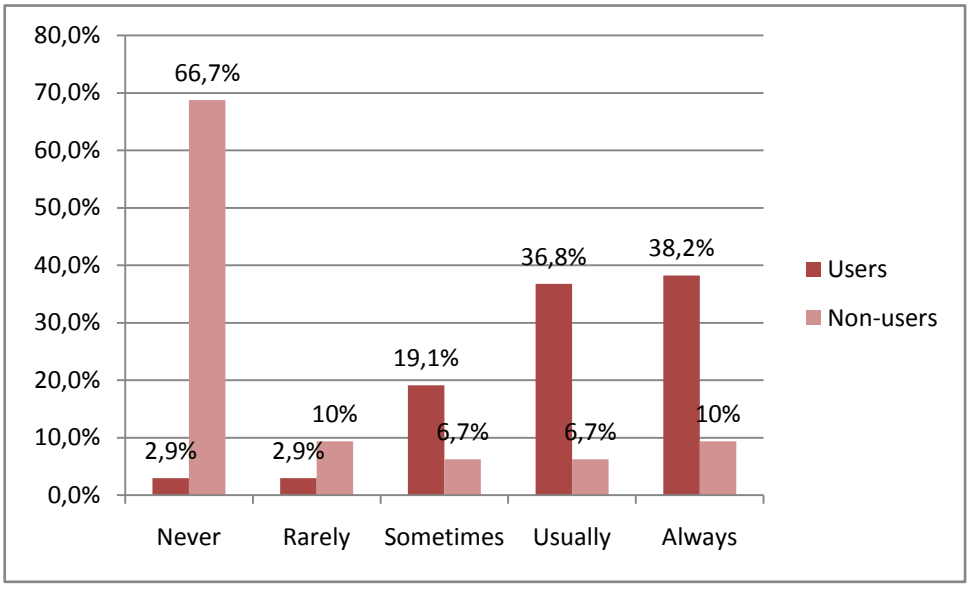
It is observed that mobile banking users rarely go to bank branches corresponding to 77 percent. And respondents who do not use mobile banking usually go to branches corresponding to 44 percent. So, an inference can be made that respondents who use mobile banking have the tendency to abandon branches.

Figure 4.2: Mobile banking usage vs. bank branch usage



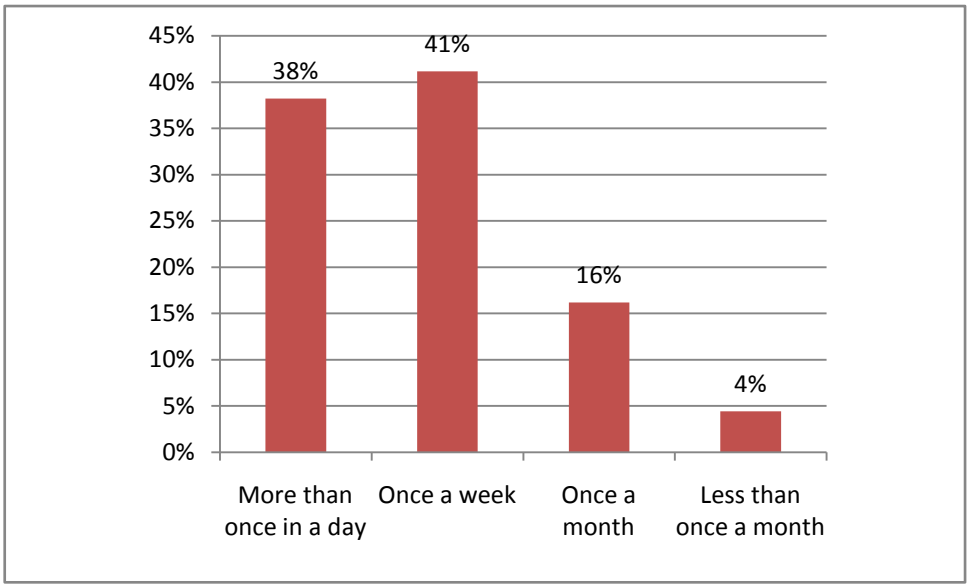
On the other hand, 67 percent of respondents who do not use mobile banking never use internet banking services though. This information also confirms the importance of the compatibility factor since the past experiences about usage habit of the electronic banking services influences adoption of the future electronic banking service namely mobile banking. In addition to that, mobile banking user respondents are also having kept on using internet banking services.

Figure 4.3: Mobile banking usage vs. internet banking usage



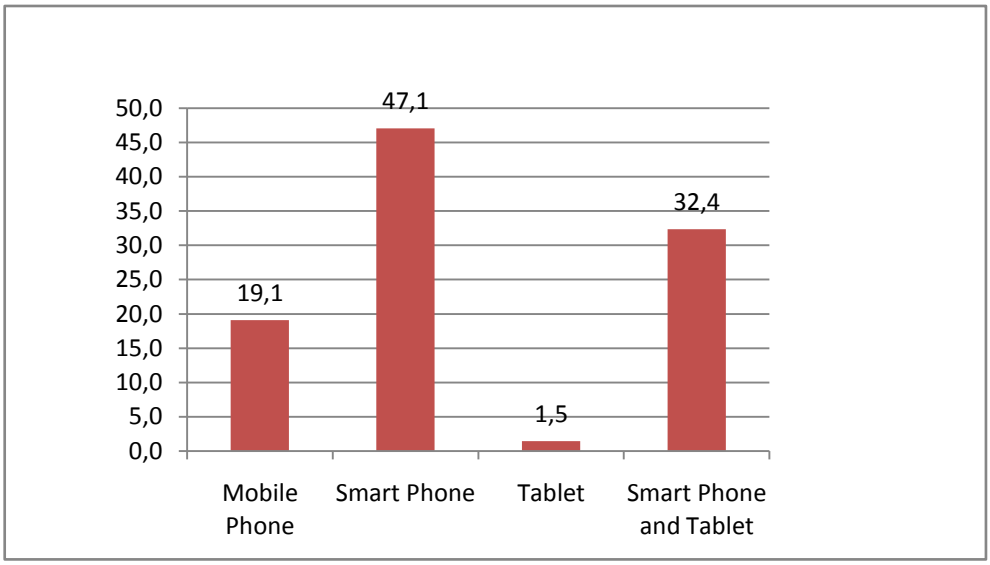
When mobile banking usage frequency is analyzed among mobile banking users only 4 percent of respondents rarely use mobile banking services. On the other hand 41 percent of users benefit the mobile banking services once a week and 38 percent of the mobile banking users use mobile banking services more than once in a day.

Figure 4.4: Mobile banking usage frequencies



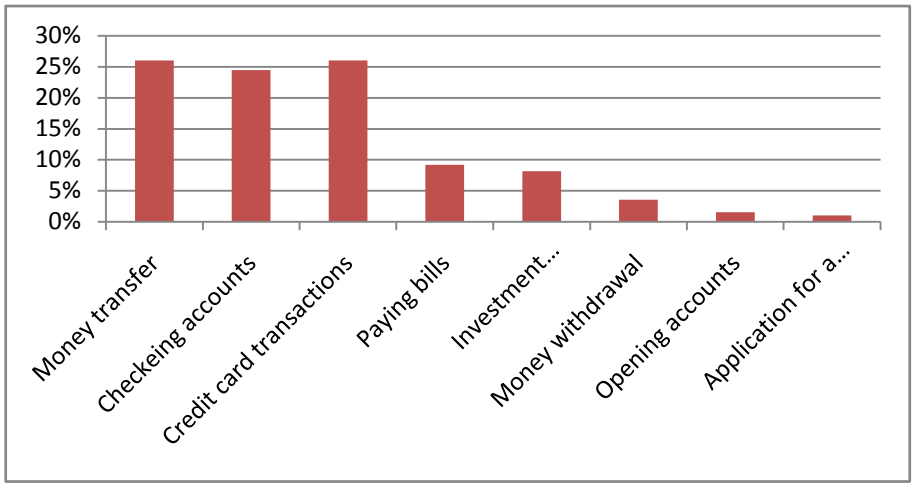
Respondents who use mobile banking services mostly use their smartphones when using mobile banking services. It is observed that multi device usage takes the second sequence while just tablet usage is in ignorable level by 1 percent. Just mobile phone usage can be considered as usage of WAP services instead of mobile applications.

Figure 4.5: Mobile device usage percentage



According to the survey, the most preferred transactions in mobile banking services are ranked in descending order as money transfer, checking accounts and credit card transactions. And the least preferred transaction has been application for financial products.

Figure 4.6: Mobile banking transaction frequencies



4.3.1.1 Reasons for not using mobile banking services for non-users

Table 4.1 represents the percentages of the reasons for not using mobile banking services by the respondents who do not use mobile banking. The table illustrates that more than half of the respondents hesitate to use mobile banking services due to lack of information about mobile banking services. The second most critical reason for not using mobile banking services are depicted as security of mobile banking services. The third reason is observed as the thought about the difficulty of using mobile banking services. On the other hand high prices of mobile devices internet access fee seems not relevant reasons for not using mobile banking services.

Table 4.2: Non-users' reasons in percentages

Reasons for not using mobile banking	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Mobile devices required for mobile banking is expensive	3,3	10,0	46,7	26,7	13,3
Mobile internet access is expensive to use mobile banking services	10,0	13,3	46,7	20,0	10,0
Mobile banking transactions are not secure	6,7	13,3	26,7	33,3	20,0
I think using mobile banking is difficult	0,0	10,0	46,7	30,0	13,3
I don't know much about mobile banking	3,3	10,0	33,3	36,7	16,7
Mobile devices are insufficient for banking services	0,0	10,0	60,0	26,7	3,3

4.3.2 Critical Factors Effecting the Mobile Banking Adoption

4.3.2.1 Factor analyses

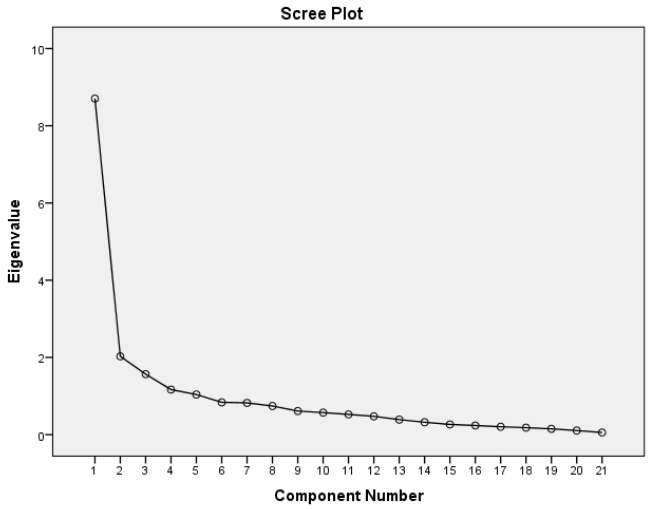
In this part, critical factors which are relative advantage, observability, complexity, compatibility, cost, personal innovativeness, image and risk are analyzed in order to understand their influence on the mobile banking adoption. Firstly, factor analysis has been conducted in order to determine the fundamental critical factors that influence the dependent variable which is mobile banking adoption. It is aimed to get a pure set of critical factors that do not intercept within each other. So, the risk of working on analogous critical factors is eliminated and the inappropriate questions under each critical factor are cleaned (Altunışık et al. 2005, p. 212). To determine if the data set is appropriate for the factor analysis and to understand if there is any relationship among the critical factors, KMO and Bartlett's Test is conducted. The results of the test have been illustrated the in table 4.2. Since the p value is lower than significance value 0,05, it is concluded that there is enough relationship among the critical factors to conduct factor analysis. In addition, since the KMO value is 0,841 which is more than 0,5 and lower than 1, it is inferred that it is appropriate to conduct factor analysis (Altunışık et. al. 2005, p. 220).

Table 4.3: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,841
Bartlett's Test of Sphericity	Approx. Chi-Square	1317,083
	Df	210
	Sig.	,000

According to the "Total Variance Explained" table, which takes place at the appendix part, the critical factors are reduced to five from eight since only five Eigenvalues take the value more than 1 (Altunışık et al. 2005, p. 222). It is resulted from the "Total Variance Explained" table; these five factors explain 69 percent of the variation.

Figure 4.7: Scree Plot



As it is seen in the Scree Plot graph at the figure 4.7 most of the factor load is cumulated at factor one. Question numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 15, 17, 19 are cumulated under factor one, question numbers 14, 20 and 21 are cumulated under factor two, question numbers 10 and 12 are cumulated under factor three, question numbers 13 and 16 are cumulated under factor four and lastly question number 18 is cumulated under factor five. Since, factor five has had only one question, question number 18 has been excluded. Also question number 3 has been realized to be odd under factor one. Since question number three is considered as not compatible with the structure of factor one, it is also excluded. After excluding these two questions the factor analysis is repeated.

According to the second factor analysis four main factors have left. When it is analyzed, the new shuffle of factor two has had incompatible questions, so new factor two is excluded from the analysis. According to the KMO and Bartlett's test, KMO value is observed as 0,840 which mean that it is appropriate to conduct factor analysis. And p value is observed as less than 0,05 which is the indicator of enough relationship among the critical factors to conduct factor analysis. Factor analysis is repeated for the third time with 16 model questions and it is observed that 3 main factors have remained with compatible questions under each factor. It is resulted from the "Total Variance Explained" table; these three factors explain 67 percent of the variation.

Table 4.4: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,840
Bartlett's Test of Sphericity	Approx. Chi-Square	1073,048
	df	120
	Sig.	,000

Table 4.5: Rotated component matrix

	Component		
	1	2	3
S8_6	**,884**		
S8_2	**,850**		
S8_8	**,833**		
S8_5	**,821**		
S8_11	**,769**		
S8_1	**,756**		
S8_4	**,751**		
S8_17	**,691**	,407	
S8_19	**,669**	,353	
S8_9	**,584**	,450	
S8_7	**,582**	,371	
S8_21_1		**,833**	
S8_14_1		**,770**	
S8_20_1	,353	**,531**	
S8_12			**,893**
S8_10			**,892**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Question numbers 1, 2, 4, 5, 6, 7, 8, 9, 11, 17, 19 are cumulated under factor one including critical factors observability, relative advantage, cost, compatibility and complexity. Question numbers 14, 20 and 21 are cumulated under factor two including critical factors complexity, cost and risk. Question numbers 10 and 12 are cumulated under factor three including critical factor image. So, the new research model has been shaped with the questions shown at the table 4.5 below. Also a new need has arisen which is renaming the new three critical factors. When the questions under the factors are examined it is observed that factor one includes questions about the advantages of adopting mobile banking, so, factor one have got the name "**overall advantages**". Questions under factor two which are about complexity, cost and risk are realized that showing the attributes of risk factor that is defined by Lee (2008). Because, Lee (2008) examines risk with its whole components which are financial, performance, security/privacy, social and time risk it would be appropriate to call factor two as "**risk**" factor with its redefinition. Factor three is realized to include questions about image, so its name has remained same as before which is "**image**".

Table 4.6: Research model questions under new critical factors

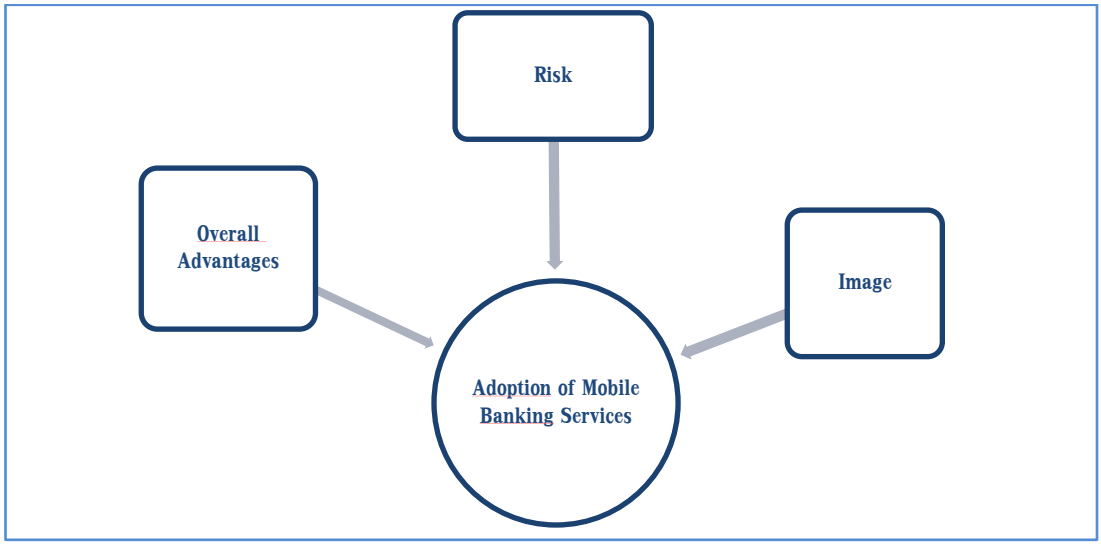
Critical Factors	Questions and Question Numbers
Overall Advantages	**1.** I have seen/ heard about others using mobile banking services
	2. I am aware of the advantages of mobile banking services
	4.Using Mobile Banking makes me do my daily transactions more easily than other banking channels
	5.Using Mobile Banking makes me do my daily transactions regardless of time
	6.Overall, I find mobile banking services are advantageous
	7. Mobile banking charge lower transaction fees than other banking channels
	8.Mobile banking is compatible with my lifestyle
	9.It is easy to learn mobile banking services
	11. Using mobile banking fits well with the way I like to manage banking transactions
	17. Using Mobile Banking enables me to do my daily transactions more quickly than other banking channels
	19. Using Mobile Banking makes me do my daily transactions regardless of place
Risk	**14.**It is not easy to use mobile banking services
	20. The mobile internet service is expensive to use mobile banking services
	21.I am worried about others to access my bank accounts due to the usage of mobile banking
Image	**10.**Using mobile banking services is a status symbol
	12. People who use mobile banking services are more prestigious

Due to the results of factor analyses, the research model is converted to a new form as it is illustrated in the figure 4.8. And it has started to examine if the critical factors: Overall Advantages, Risk and Image influence adoption of mobile banking. Since then, hypotheses have been also changed accordingly with the new critical factors. Two new hypotheses H14 and H15 are added and some of the hypotheses are excluded from the research. Modified hypotheses table shows the current status of the hypotheses.

Table 4.7: Modified hypotheses

No	**Hypothesis**	**Status**
H1	Relative advantage of mobile banking services has an influence on mobile banking adoption.	Excluded
H2	Observability of mobile banking services has an influence on mobile banking adoption.	Excluded
H3	Complexity of mobile banking services has an influence on mobile banking adoption.	Excluded
H4	Compatibility of mobile banking services has an influence on mobile banking adoption.	Excluded
H5	Image has an influence on mobile banking adoption.	Included
H6	Risk has an influence on mobile banking adoption.	Excluded
H7	Personal innovativeness has an influence on mobile banking adoption.	Excluded
H8	Cost has an influence on mobile banking adoption.	Excluded
H9	Gender of the individuals has an influence on Mobile Banking adoption.	Included
H10	Age of the individuals of has an influence on Mobile Banking adoption.	Included
H11	Education level of the individuals of has an influence on Mobile Banking adoption.	Included
H12	Occupation of the individuals of has an influence on Mobile Banking adoption.	Included
H13	Income level of the individuals of has an influence on Mobile Banking adoption	Included
H14	Overall advantages have an influence on mobile banking adoption.	Added
H15	Risk has an influence on mobile banking adoption.	Added

Figure 4.8: Modified research model



4.3.2.2 Reliability analyses

According to the reliability statistics the alpha values of the critical factors have been realized at acceptable values since all of them are more than 0,5 (Altunışık et al. 2005, p. 116).

Table 4.8: Reliability statistics

Critical Factors	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Overall Advantage	,934	,938	11
Risk	,671	,673	3
Image	,801	,801	2

4.3.2.3 Logistic regression analysis

In this part of the research further analysis has been conducted in order to test the influence of independent variables: overall advantages, risk and image on the dependent variable which is the adoption of mobile banking. Logistic regression analysis is preferred due to the structure of the dependent variable which is binary/dichotomous: "**mobile banking adoption—yes/no**" (Hosmer&Lemeshow 2000). In addition to that, "unlike multiple regression and discriminant analysis, logistic regression does not entail

assumptions related with normality, linearity and homogeneity of variance for the independent variable, which evidences the popularity of the model. Logistic regression assumes that the outcomes are independent, mutually exclusive, and finally in order to obtain accuracy, requires large samples, which is set to be a minimum of 20 cases per predictor" (Leech et al 2004, p 109). After the factor analyses, three critical factors have remained, so, logistic regression analysis requires at least 60 cases. Since 98 respondents have contributed to the analyses, the logistic regression requirements are met. Hence, logistic regression analysis is conducted for the dependent variable mobile banking adoption and for the independent variables overall advantages, risk and image.

The relationship between the dependent variable adoption and the overall combination of the independent variables in other words predictors is tested in the Omnibus Tests of Model Coefficients table represented in Table 4.7.The model chi-square value of 68,237 with a p-value of less than 0.05 tells us that our model as a whole fits significantly. So, the relationship between the combination of the independent variables and the dependent variable is verified.[45]

Table 4.9: Omnibus tests of model coefficients

		Chi-square	Df	Sig.
Step 1	Step	68,237	3	,000
	Block	68,237	3	,000
	Model	68,237	3	,000

The model summary table below illustrates the computation of correlation measures to estimate the strength of the relationship The Nagelkerke R Square shows that about 71% of the variation in the outcome variable which is adoption of mobile banking is explained by this logistic model. (Chan 2004, p.150)

[45]Ucla, http://www.ats.ucla.edu/stat/spss/dae/logit.htm[Access date 10 June 2014].

Table 4.10: Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	52,492[a]	,502	,708
a. Estimation terminated at iteration number 7 because parameter estimates changed by less than,001.			

In order to evaluate the usefulness of the logistic regression model it is checked if the overall percentage accuracy rate is 25 percent higher than the accuracy by chance (Schwab 2006). Accuracy by chance rate is calculated by summing the squared percentages of the cases in the classification table at Step 0 (Kahn, 2006, p 109).

Table 4.11: Classification table step 0

Observed			Predicted		
			Adoption		Percentage Correct
			No	Yes	
Step 0	Adoption	No	0	30	0,0
		Yes	0	68	100,0
	Overall Percentage				69,4
a. Constant is included in the model.					
b. The cut value is,500					

So, accuracy by chance rate is computed as 0.575. And by chance accuracy rate criteria is computed as 0.718 or in other words 71.8 percent. Since the overall percentage accuracy rate, that is depicted in the Classification Table Step 1, is 89.8 percent, the logistic model is found to be useful with a high accuracy rate.

30/98=0.306 **(4.1)**

68/98=0.694 **(4.2)**

$$0.306^2 + 0.694^2 = 0.575 \quad (4.3)$$

$$0.575+0.575*0.25 = 0.718 \quad (4.4)$$

Table 4.12: Classification table step 1

Observed			Predicted		
			Adoption		Percentage Correct
			No	Yes	
Step 1	Adoption	No	23	7	76,7
		Yes	3	65	95,6
	Overall Percentage				89,8
a. The cut value is,500					

In logistic regression, in order to identify the multicollinearity between independent variables, numerical errors should be detected and the problematic variables should be excluded from the analyses. For this reason, the standard errors (SE) column of the Variables in the Equation table is checked if the there is any value above 2.0 (Schwab 2006). Thus, it is observed that there is no numerical problem with the independent variables since SE values are less than 2.0 in the table.

Table 4.13: Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Overall Advantages	3,361	,768	19,130	1	,000	28,818
	Image	,719	,454	2,511	1	,113	2,052
	Risk	-1,084	,533	4,143	1	,042	,338
	Constant	-10,816	3,687	8,606	1	,003	,000
a. Variable(s) entered on step 1: Overall Advantages, Image, Risk.							

When the variables in the equation table is examined p-value of the overall advantages (.000) and risk (.042) critical factors are observed to be less than 0.05 so, these independent variables are found to be statistically significant. However, since p-value of the critical factor image (.113) is more than 0.05, image is appeared as statistically insignificant.

According to the results, hypothesis *H14:* Overall advantages have an influence on mobile banking adoption and hypothesis *H15:* Risk has an influence on mobile banking adoption is supported while hypothesis *H5:* Image has an influence on mobile banking adoption is rejected.

Similar to the linear regression analyses, logistic regression coefficients in the column "B" indicates the direction and the strength of the relationship between the dependent and the independent variables. However, unlike the linear regression "B" represents the influence of a one unit change in the independent variable on the log-odds of the dependent variable. Odds ratios are stated in the Exp(B) column in the table 4.10 above. "If B represents the regression coefficient for predictor, then exponentiating B yields the odds ratio. When all other predictors are held at a constant, the odds ratio means the change in the odds of dependent variable given a unit change in independent variable*"*(Peng et.al. 2002).

For the critical factor overall advantages the value of Exp(B) is displayed as 28.8 which implies that a one unit increase in overall advantages increases the odds of mobile banking adoption by a factor of 28.8. When we subtract 1 from this value, we get the proportion increase (or decrease) in the odds caused by increase in overall advantage (Norman &Streiner 2010). In other words, for each unit increase in the rate of overall advantages, odds of adopting mobile banking are increased by 2780 percent. So, it is also seen that there is positive relationship between overall advantages and mobile banking adoption.

28.8 – 1.0 = 27.8 **(4.5)**

For the critical factor risk the value of Exp (B) is displayed as,338 which implies that a one unit increase in risk decreases the odds of mobile banking adoption by a factor of,338. In other words, for each increase in the rate of risk, odds of adopting mobile banking is decreased by 66.2 percent. So, it is also seen that there is negative relationship between risk and mobile banking adoption.

0.338 – 1.0 = -0.662 **(4.6)**

4.3.3 Demographic Characteristics and Mobile Banking Adoption

4.3.3.1 Gender

Table 4.11 represents the gender profiles of the respondents which illustrates that 58 percent of the respondents is female while males accounts for 42 percent of the respondents. Within the females mobile banking usage is higher with a percentage of 72 percent than 66 percent within males. In order to understand if gender makes any significant difference on mobile banking adoption, chi square independence test has been conducted (Altunışık et al. 2005, p. 194). According to the chi square independence test it is observed that p value is .520 which is greater than .05. It is concluded that there is no significant difference in terms of gender on the adoption of mobile banking. So, it is found out that gender has not statistically significant influence on the adoption of the mobile banking and hypothesis *H9: "*Gender of the individuals has an influence on Mobile Banking adoption" is rejected.

Table 4.14: Gender vs. mobile banking usage

			Adoption		Total
			Non Users	Users	
Gender	Female	Count	16	41	57
		Expected Count	17,4	39,6	57,0
		% within Gender	28,1%	71,9%	100,0%
		% within Adoption	53,3%	60,3%	58,2%
	Male	Count	14	27	41
		Expected Count	12,6	28,4	41,0
		% within Gender	34,1%	65,9%	100,0%
		% within Adoption	46,7%	39,7%	41,8%
Total		Count	30	68	98
		Expected Count	30,0	68,0	98,0
		% within Gender	30,6%	69,4%	100,0%
		% within Adoption	100,0%	100,0%	100,0%

Table 4.15: Chi-Square tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	,414[a]	1	,520		
Continuity Correction[b]	,178	1	,673		
Likelihood Ratio	,413	1	,521		
Fisher's Exact Test				,657	,335
Linear-by-Linear Association	,410	1	,522		
N of Valid Cases	98				
a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 12,55.					
b. Computed only for a 2x2 table					

4.3.3.2Age

The results of the survey have depicted in the table4.13 that respondents between 25-34 years old have the highest mobile banking usage and the following age groups are ranked as 18-24 and 35-49 years old. When the respondents more than 50 years old are examined, it is noticed that none of them are using mobile banking services. In order to understand if age has a statistically significant influence on mobile banking adoption, chi square independence test has been conducted (Altunışık et al. 2005, p. 194). According to the results of the chi square independence test, age has statistically significant influence on the adoption of the mobile banking since p value is smaller than 0.05. So the hypothesis *H10: "*Age of the individuals of has an influence on Mobile Banking adoption" is supported.

Table 4.16: Age vs. mobile banking usage cross tabulation

			Adoption		Total
			Non Users	Users	
Age	18-24	Count	4	10	14
		Expected Count	4,3	9,7	14,0
		% within Age	28,6%	71,4%	100,0%
		% within Adoption	13,3%	14,7%	14,3%
	25-34	Count	9	50	59
		Expected Count	18,1	40,9	59,0
		% within Age	15,3%	84,7%	100,0%
		% within Adoption	30,0%	73,5%	60,2%
	35-49	Count	8	8	16
		Expected Count	4,9	11,1	16,0
		% within Age	50,0%	50,0%	100,0%
		% within Adoption	26,7%	11,8%	16,3%
	50+	Count	9	0	9
		Expected Count	2,8	6,2	9,0
		% within Age	100,0%	0,0%	100,0%
		% within Adoption	30,0%	0,0%	9,2%
Total		Count	30	68	98
		Expected Count	30,0	68,0	98,0
		% within Age	30,6%	69,4%	100,0%
		% within Adoption	100,0%	100,0%	100,0%

Table 4.17: Chi-Square tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29,810[a]	3	,000
Likelihood Ratio	31,399	3	,000
Linear-by-Linear Association	18,972	1	,000
N of Valid Cases	98		
a. 3 cells (37,5%) have expected count less than 5. The minimum expected count is 2,76.			

Another test called logistic regression is conducted in order to understand if there is a significant relation between the age and the adoption of the mobile banking. The reason to choose logistic regression has been the dependent variable of the research which has binary structure (Norman &Streiner 2010). According to the test, since p value is smaller than .05, age is revealed as a statistically significant variable on the adoption of the mobile banking. It is confirmed with this test. In the table, Exp(B) is represented as.262.When we subtract 1 from this value, we get the proportion increase (or decrease) in the odds caused by increase in age(Norman &Streiner 2010). When 1 is subtracted from .262 we obtain -.74. So, we can conclude that a year increase in age decreases odds of mobile banking adoption by 74 percent. The other way around, as age decreases we can say that mobile banking adoption increases.

Table 4.18 Logistic regression test for age

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	S11	-1,340	,345	15,096	1	,000	,262
	Constant	3,914	,848	21,330	1	,000	50,112

a. Variable(s) entered on step 1: Age.

Further analysis on age and mobile banking transactions show that respondents between the ages 18-24 mostly checking their accounts while respondents between the ages 25-34 mostly transfer money on mobile banking. And respondents between the ages 35-49 mostly conduct credit card transactions. As an inference, we can conclude that as the working years and the age increase the transactions get more monetary.

Table 4.19: Mobile banking transactions vs. age cross tabulation

Transactions on mobile banking		Age				Total
		18-24	25-34	35-49	50+	
Money transfer	Count	7	40	4	0	51
	Percent	50%	67%	25%	0%	51%
Checking accounts	Count	10	32	6	0	48
	Percent	71%	53%	38%	0%	48%
Credit card transactions	Count	5	39	7	0	51
	Percent	36%	65%	44%	0%	51%
Paying bills	Count	3	13	2	0	18
	Percent	21%	22%	13%	0%	18%
Investment transactions	Count	0	14	2	0	16
	Percent	0%	23%	13%	0%	16%
Money withdrawal	Count	0	6	1	0	7
	Percent	0%	10%	6%	0%	7%
Opening accounts	Count	3	0	0	0	3
	Percent	21%	0%	0%	0%	3%
Application for a financial product or service	Count	2	0	0	0	2
	Percent	14%	0%	0%	0%	2%
Not using mobile banking	Count	4	9	8	9	30
	Percent	29%	17%	50%	100%	32%

4.3.3.3 Education Level

It is illustrated in table 4.17 that 6 percent of the respondents have less than high school degree, 20 percent of respondents have high school degree, 56 percent have university degree and 17 percent have master degree. Within the education level master degree mobile banking usage is higher with the percentage of 94 than 17 percent within education secondary school. It is observed in the cross table that the more the education level increases the more mobile banking usage increase.

Table 4.20: Education level vs. mobile banking usage

			Adoption		Total
			Non Users	Users	
Education Level	Secondary School	Count	5	1	6
		Expected Count	1,8	4,2	6,0
		% within Education Level	83,3%	16,7%	100,0%
		% within Adoption	16,7%	1,5%	6,1%
	High School	Count	10	10	20
		Expected Count	6,1	13,9	20,0
		% within Education Level	50,0%	50,0%	100,0%
		% within Adoption	33,3%	14,7%	20,4%
	University	Count	14	41	55
		Expected Count	16,8	38,2	55,0
		% within Education Level	25,5%	74,5%	100,0%
		% within Adoption	46,7%	60,3%	56,1%
	Master Degree	Count	1	16	17
		Expected Count	5,2	11,8	17,0
		% within Education Level	5,9%	94,1%	100,0%
		% within Adoption	3,3%	23,5%	17,3%
Total		Count	30	68	98
		Expected Count	30,0	68,0	98,0
		% within Education Level	30,6%	69,4%	100,0%
		% within Adoption	100,0%	100,0%	100,0%

In addition to that, according to the results of the chi square independence test, education level has statistically significant influence on the adoption of the mobile banking adoption since p value is smaller than 0,05. So, the hypothesis *H11: "*Education level of the individuals of has an influence on Mobile Banking adoption." is supported.

Table 4.21: Chi-Square tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16,974[a]	3	,001
Likelihood Ratio	17,590	3	,001
Linear-by-Linear Association	16,478	1	,000
N of Valid Cases	98		
a. 2 cells (25,0%) have expected count less than 5. The minimum expected count is 1,84.			

The logistic regression test also represents that education level is statistically significant for the adoption of mobile banking. The test also shows that increase in the education level also cause increase in the odds of mobile banking adoption by a factor of 3,63.

Table 4.22: Logistic regression test for education level

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Education	1,293	,351	13,593	1	,000	3,643
	Constant	-2,720	,968	7,897	1	,005	,066
a. Variable(s) entered on step 1: Education Level.							

4.3.3.4 Occupation

It is shown in table 4.20 that 76 percent of the respondents work in private sector, 16 percent work in public sector and 8 percent of respondents are self-employed. Mobile banking usage is higher than the other working groups within private sector by 76 percent. Than public sector proceeds by 63 percent and lastly 25 percent of self-employed respondents use mobile banking.

Table 4.23: Occupation vs. mobile banking usage

			Adoption		Total
			Non Users	Users	
Occupation	Private Sector	Count	18	56	74
		Expected Count	22,7	51,3	74,0
		% within Occupation	24,3%	75,7%	100,0%
		% within Adoption	60,0%	82,4%	75,5%
	Public Sector	Count	6	10	16
		Expected Count	4,9	11,1	16,0
		% within Occupation	37,5%	62,5%	100,0%
		% within Adoption	20,0%	14,7%	16,3%
	Self Employed	Count	6	2	8
		Expected Count	2,4	5,6	8,0
		% within Occupation	75,0%	25,0%	100,0%
		% within Adoption	20,0%	2,9%	8,2%
Total		Count	30	68	98
		Expected Count	30,0	68,0	98,0
		% within Occupation	30,6%	69,4%	100,0%
		% within Adoption	100,0%	100,0%	100,0%

In addition to that, according to the results of the chi square test, occupation has statistically significant influence on the adoption of the mobile banking adoption since p

value is smaller than 0,05. So, the hypothesis *H12:"* Occupation of the individuals of has an influence on Mobile Banking adoption." is supported.

Table 4.24: Chi-Square tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9,155[a]	2	,010
Likelihood Ratio	8,452	2	,015
Linear-by-Linear Association	8,352	1	,004
N of Valid Cases	98		
a. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 2,45.			

4.3.3.5 Income Level

It is depicted in table 4.22 that 33 percent of the respondents have income less than 1.500 TL, 22 percent of the respondents have income between 1.500 and 3.000, 35 percent have income between 3.000 and 5.000 and 10 percent have income more than 5.000 TL. When the mobile banking usage is examined it is observed that as income level increase mobile banking usage is increasing.

Table 4.25: Income level vs. mobile banking usage

			Adoption		Total
			Non Users	Users	
Income Level	1500-	Count	14	18	32
		Expected Count	9,8	22,2	32,0
		% within Income Level	43,8%	56,3%	100,0%
		% within Adoption	46,7%	26,5%	32,7%
	1500-3000	Count	10	12	22
		Expected Count	6,7	15,3	22,0
		% within Income Level	45,5%	54,5%	100,0%
		% within Adoption	33,3%	17,6%	22,4%
	3001-5000	Count	5	29	34
		Expected Count	10,4	23,6	34,0
		% within Income Level	14,7%	85,3%	100,0%
		% within Adoption	16,7%	42,6%	34,7%
	5000+	Count	1	9	10
		Expected Count	3,1	6,9	10,0
		% within Income Level	10,0%	90,0%	100,0%
		% within Adoption	3,3%	13,2%	10,2%
Total		Count	30	68	98
		Expected Count	30,0	68,0	98,0
		% within Income Level	30,6%	69,4%	100,0%
		% within Adoption	100,0%	100,0%	100,0%

In addition to that, according to the results of the chi square independence test, income level has statistically significant influence on the adoption of the mobile banking adoption since p value is smaller than 0,05.So, the hypothesis *H13:* "Income level of the individuals of has an influence on Mobile Banking adoption." is supported.

Table 4.26: Chi-Square tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10,932[a]	3	,012
Likelihood Ratio	11,656	3	,009
Linear-by-Linear Association	8,698	1	,003
N of Valid Cases	98		
a. 1 cells (12,5%) have expected count less than 5. The minimum expected count is 3,06.			

The logistic regression test also represents that income level is statistically significant for the adoption of mobile banking. The test also shows that increase in the education level also cause increase in the mobile banking adoption.

Table 4.27: Logistic regression test for income level

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Income Level	,697	,243	8,213	1	,004	2,008
	Constant	-,636	,528	1,454	1	,228	,529
a. Variable(s) entered on step 1: Income Level.							

Consequently, some of the hypotheses are rejected and some of them supported. Table 4.28 displays the hypotheses in detail.

Table 4.28: Situation of hypotheses

No	Hypothesis	Status	Supported/ Rejected
H1	Relative advantage of mobile banking services has an influence on mobile banking adoption.	Excluded	
H2	Observability of mobile banking services has an influence on mobile banking adoption.	Excluded	
H3	Complexity of mobile banking services has an influence on mobile banking adoption.	Excluded	
H4	Compatibility of mobile banking services has an influence on mobile banking adoption.	Excluded	
H5	Image has an influence on mobile banking adoption.	Included	Rejected
H6	Risk has an influence on mobile banking adoption.	Excluded	
H7	Personal innovativeness has an influence on mobile banking adoption.	Excluded	
H8	Cost has an influence on mobile banking adoption.	Excluded	
H9	Gender of the individuals has an influence on Mobile Banking adoption.	Included	Rejected
H10	Age of the individuals of has an influence on Mobile Banking adoption.	Included	Supported
H11	Education level of the individuals of has an influence on Mobile Banking adoption.	Included	Supported
H12	Occupation of the individuals of has an influence on Mobile Banking adoption.	Included	Supported
H13	Income level of the individuals of has an influence on Mobile Banking adoption	Included	Supported
H14	Overall advantages have an influence on mobile banking adoption.	Added	Supported
H15	Risk has an influence on mobile banking adoption.	Added	Supported

5. DISCUSSION AND IMPLICATIONS

In this part of the research the results of the statistics will be evaluated and similarities or differences of the results will be discussed with the previous literature. When the evolution of the research is examined two research questions have been asked and in order to find answers to the research questions, a model has been constituted including constructs form several innovation diffusion theories. These constructs: relative advantage, observability, complexity, compatibility, cost, personal innovativeness, image and risk are defined as critical factors. In addition to the critical factors, by using demographic factors: gender, age, education level, occupation and income level thirteen hypotheses have been developed. The hypotheses have been mainly focused on if there is influence of the related factor on the adoption of the mobile banking. The analyses have been conducted in two parts including the critical factors and the demographic characteristics.

Firstly critical factors have been examined. As the very first analysis, factor analyses have been conducted for the critical factors in order to determine the fundamental critical factors that influence the dependent variable which is mobile banking adoption. It is aimed to get a pure set of critical factors that do not intercept within each other. So, the risk of working on analogous critical factors is eliminated and the inappropriate questions under each critical factor are cleaned. As the result of the factor analyses, three critical factors have remained. When the questions gathered under each factor is considered, two of the factors have been renamed as overall advantages and risk and the critical factor image have stayed same. After having three critical factors logistic regression analysis has been conducted in order to understand which factors are statistically significant and which factors effect adoption of mobile banking in which direction. So, a new research model has been constituted including new critical factors: overall advantages, risk and image. The next parts include evaluation of critical and demographic factors, managerial implications, contribution to the research and limitations.

5.1 EVALUATION OF CRITICAL FACTORS

5.1.1 Overall Advantages

According to the results of factor analyses, factor one is renamed as overall advantages. Factor one is observed to encompass questions about critical factors observability, relative advantage, cost, compatibility and complexity. When the questions are examined deeply it is seen that they are all about advantages of mobile banking services including being aware of the services doing banking transactions easily and quickly regardless of time and location, lower transaction fees, compatibility with the life style, effortless learning process. When the literature is considered, Rogers (1995) addresses relative advantage as increased efficiency, economic benefits, and enhanced status. Thus, it is observed that except gaining status the other items cover the factor one according to Rogers's point of view. However, considering the imperfect convergence, factor one is renamed as overall advantages instead of relative advantage. A new hypothesis is developed which is *H14:* Overall advantages of mobile banking services has an influence on mobile banking adoption.

The results of logistic regression analysis have revealed that overall advantages have strongly positive influence on the mobile banking adoption. So, H14 is accepted. The researches of Davis et al.(1989), Moore and Benbasat (1991), Agarwal Prasad(1997), Gerrard& Cunningham (2003), Tan&Teo (2000) and Suoranta (2003) also show that the advantages or the namely perceived usefulness of an innovation have influence on the adoption. So, it can be concluded that benefits of the mobile banking services are very important for the respondents over the adoption of mobile banking.

5.1.2 Risk

According to the results of factor analyses, factor two is renamed as risk. Factor two is observed to encompass questions about critical factors complexity, cost and risk. When the questions are examined deeply it is seen that that they are about belief about the complexity of using the mobile banking service, belief about the high cost of internet access and security concerns. It is realized that factor two is showing the attributes of risk factor that is defined by Lee (2008). Although our first definition of risk only

includes security concern, Lee (2008) examines risk with its whole components which are financial, performance, security/privacy, social and time risk. So, it would be appropriate to call factor two as risk factor with its redefinition. A new hypothesis is developed which is *H15:* Risk has an influence on mobile banking adoption.

The results of logistic regression analysis have revealed there is negative relationship between risk and mobile banking adoption. So, H15 is accepted. The researches ofTan&Teo (2000) and Cruz (2010) also show that the risk is an important factor that influence adoption.

5.1.3 Image

According to the factor analysis it is realized that factor three encompass questions about critical factor image. So, image factor is included in the analyses as it is. However, according to the logistic regression analysis it has been found to be insignificant for the adoption of mobile banking. So, hypothesis *H5:* Image has an influence on mobile banking adoption, is rejected although Lu et al. (2003), Moore &Benbasat (1991) and Crabbe et.al. (2009) have found out image as an influential factor on innovation adoption.

5.2 EVALUATION OF DEMOGRAPHIC FACTORS

5.2.1 Gender

Hypothesis nine is developed to examine the influence of gender on mobile baking adoption. According to the chi-square analysis it is found to be insignificant statistically.

5.2.2 Age

Hypothesis ten is developed to examine the influence of gender on mobile baking adoption. According to the chi-square analysis it is found to be significant statistically. When a further analysis has conducted it is revealed that as age increases mobile banking adoption is decreasing. The result seems to be parallel to the Nielsen report (2013) which states that smartphone ownership increases as the age go down, from the other way around. Although, Rogers say that “relatively earlier adopters in a social

system are no different from later adopters in age", this research has showed that as people get older they are not involved in the technological services and products including mobile banking services (Hoffmann 2011, p.44).

Further analysis on age and mobile banking transactions show that respondents between the ages 18-24 mostly checking their accounts while respondents between the ages 25-34 mostly transfer money on mobile banking. And respondents between the ages 35-49 mostly conduct credit card transactions. As an inference, we can conclude that as the working years and the age increase the transactions get more monetary.

5.2.3 Education Level

Hypothesis eleven is developed to examine the influence of education level on mobile baking adoption. The analyses of chi-square and logistic regression have showed that education level is statistically significant for the adoption of mobile banking and as the education level increase mobile banking adoption increases. So, the claim of Rogers which is "the relatively early adopters have more years of formal education, are more likely to be literate, and have higher social status and occupations" have been proof by this research (Hoffmann 2011, p.44).

5.2.4 Occupation

Hypothesis twelve is developed to examine the influence of occupation on mobile baking adoption. The analyses have showed that occupation is statistically significant on the mobile banking adoption.

5.2.5 Income Level

Hypothesis thirteen is developed to examine the influence of income level on mobile baking adoption. The logistic regression test also represents that income level is statistically significant for the adoption of mobile banking. The test also shows that increase in the education level also cause increase in the mobile banking adoption.

5.3 MANAGERIAL IMPLICATONS

Mobile banking is a very hot topic in the world and so as for Turkey. Although banks all over the world have the tendency to increase their investment on innovation especially on channel innovation which means electronic banking and specifically mobile banking, according to the results of the survey respondents who are not using mobile banking are hesitating to use mobile banking due to lack of information and namely awareness about mobile banking services. In addition to that according to the responses of whole respondents, the most effective way to be aware of the mobile banking services is observed to be from close friends rather than advertisement or bank personnel. The combination of these two outputs should be considered by marketing managers in terms of determining the right strategy for creating awareness for their mobile banking services and adoption of mobile banking. It should be noted that the knowledge of an innovation is the very first step for the diffusion of and innovation as Rogers (1995) states. Since the results show that the close friends or peers are more effective in creating awareness, word of mouth seems to be an important marketing strategy for bank marketers. In addition to that benefiting opinion leaders would be another effective strategy to create awareness. According to the survey results advertisements take the second sequence about getting information about mobile banking. 2014 has been a year for Turkey that mobile banking advertisements are launched by many banks. However, overdose TV advertisements may have a negative influence on the banking customers. So, for the next phase of creating awareness embedded marketing that includes, product placement and placement of brands within entertainment channels such as movies, television and video games should also be considered. The results of the survey have showed that getting information from bank personnel about mobile banking services are least effective way for awareness. According to the survey results it is observed that mobile banking users rarely go to bank branches corresponding to 77 percent. And respondents who do not use mobile banking usually go to branches corresponding to 44 percent. So, bank branches and bank personnel are mediums that have room for improvement in terms of marketing mobile banking. The bank marketers may give weight to informing customers who come to branches and maybe activity marketing sessions including workshops for customers may be organized. Another way that help diffusion of innovation would be considered as forming partnerships with technology firms. For instance, Unicreditwhich

is an Italian bank has conducted a campaign and has collected demand from its customers during March 2014 for Samsung smartphones. And when the smartphones have received by the customers, smartphones have included the bank's mobile banking application inside.[46] This kind of partnerships would be increase the rate of mobile baking adoption.

As the mobile world gain importance especially with the help of wireless internet and mobile devices, future of banking sector also seems to be very different than now. Wearable mobile devices are also the candidates for mobile banking services. Google glass and smartwatches are already ready to strike future of banking sector. "CaixaBank has created an app allowing users to follow stock markets and convert currencies using their Google Glass devices and smartwatches."[47] So, banks need to be eager to the every technological development in order to act and react simultaneously with their competitors.

In addition to tracking new the technological developments, new trends in the banking should also be observed very closely. The new trend branchless banking which is a kind of distribution channel strategy mainly leaving classical banking branches and using online and mobile banking has wrap around the banking sector due to the reduced cost appeal for banks.[48] So the future of banking sector may require mobile banking not as an additional service but the main service for the banks. Since the mobile penetration and the mobile banking usage is increasing both in Turkey and in the world, this new strategy seems to be compatible with the future habits of the banking customers. Hence, banks need to be open to the any changes in the sector to survive in the future.

Literature review has revealed a new financial behavior of banking customers which is paying less in cash and more with the alternative payment tools including credit cards, contactless payments, digital wallets etc. Digital wallet has been one of the most striking innovations that contribute to the cashless society. Although many banks

[46]Unicredit, https://www.unicredit.it/it/info/subitobancastore/hi-tech.html[Access date 01 May 2014].
[47]Telegraph. http://www.telegraph.co.uk/technology/news/10649026/Wearable-banking-app-launched-for-Google-Glass-and-smartwatches.html[Access date 24 August 2014].
[48] WIB, http://www.wib.org/publications__resources/article_library/2013-14/sep13_roth.html[Access date 24 August 2014].

involve in the digital wallet services there is still room for other banks to take their place in the mobile banking competition.

Social networking via applications such as Facebook, Twitter, Foursquare etc. has become main player of mobile marketing in many sectors. Banking sector has also been benefiting the social networking since their customers like social connections.[49] Many mobile banking applications have social networking features such as digital wallet Venmo provides service to share the transaction with a message on social media such as Facebook, Twitter or Foursquare and in Turkey iGarantiprovides their customers to transfer money to Facebook friends who have the same application. So, it would be better for banks to cover many mediums to increase their mobile banking usage.

In the context of mobile banking services, many advantages are provided to customers that enhance the performance of doing banking transactions and increase these services' efficiency in terms of convenience, time and control. The survey results have showed that one unit increase in overall advantages factor of mobile banking is 28 times more effective than one unit decrease in risk factor on mobile banking adoption. So, it is revealed that it would be better for banks to focus more on improving advantages of mobile banking than minimizing risk factor of mobile banking. In order to improve advantages and decreasing the risk, which also includes complexity in this research, of mobile banking services, giving weight to functionality and user experience would be beneficial on the way to adoption of mobile banking. As Marous (2014) states, functionality and simplicity bring out customer engagement for mobile banking services and results with adoption.[50]

5.4 CONTRIBUTION

This study reviews many innovation diffusion theories and clarifies fundamental factors from those theories in order to examine which of them at what extended influence mobile banking adoption in Turkey. So, the results of the research contribute to the cumulative knowledge in adoption of innovations. Specifically, the research identifies two critical factors which are overall advantages and risk factors that have great

[49]Thefinancialbrand, http://thefinancialbrand.com/36914/mobile-banking-application-engagement/[Access date 24 August 2014].
[50]Marous http://thefinancialbrand.com/40109/best-mobile-banking/[Access date 02 June 2014].

influence on mobile banking adoption. In addition to these two critical factors, age, education level, occupation and income level have also found to be influential on mobile banking adoption.

5.5 LIMITATIONS

The research study holds some limitations regarding the sampling method and the sampling size. Because of time and cost restrictions snowball sampling is chosen. Snowball sampling is a non-probability sampling so it is not certain that it will represent the population. For further researches sampling technique and sample size would be improved.

5.6 FUTHER REASEARCH

In this dissertation, the sampling frame was limited to Turkey. So, a further research would be conducted in a multicultural and cross-border context in order to find out the cultural differences and similarities of different countries on mobile banking adoption.

As one of the components of mobile banking, digital wallets have been gaining importance on the mobile payment systems. Digital wallets also have impulsive effect on shifting the banking customers' behaviors in terms of paying less in cash. So, as an important service of the cashless society and as a sub-service of mobile banking, digital wallet adoption would be a further research topic for the researchers.

Electronic banking services that are internet banking and mobile banking services have been the most important channel innovation for the banking sector. Instead of providing classical banking branch services, providing electronic banking services have contributed to the banks in terms of low cost of these services. So, the sector now has the tendency to provide just electronic banking services and leave traditional branches. So, a new research on the branchless banking services and the branchless banking adoption would be conducted.

Wearable mobile devices are another topic that banks are planning to insert mobile banking applications in. Although some banks have already created their application for

Google glass and smart watches, it is still an unknown if these wearable mobile devices will be adopted by consumers. So, further research might be conducted on mobile banking applications on wearable devices.

6. CONCLUSION

Evolutions of wireless internet and mobile devices including smartphones and tablets have created a new era which transfers all the market place to mobile and make consumers benefit mobile activities such as messaging, watching videos, films, serials, using internet, social networking, banking services, shopping, listening to music. Increasing number of wireless internet users and smartphone owners are the indicators for the hot focus on the mobile activities. Demand for mobile products and services have affected many sectors including banking sector.

Penetration of the information technology in the banking sector had transformed banking activities into digitized and automated form already. However, extensive competition and these technological innovations namely wired/wireless internet and mobile devices forced banks to develop new service delivery channels for their customers. Electronic banking with its two major components Internet banking and mobile banking has been striking innovations in the banking sector.

Mobile banking has brought its own trends together. The cashless society concept, tendency for branchless banking, partnerships of banks with telecom companies, usage of wearable devices on banking transactions, combination of social networking applications with mobile banking applications have been some of the topics for the mobile banking sector.

This dissertation has aimed to gain a general understanding about which factors influence mobile banking adoption in Turkey. The research questions "How critical factors do influence and how do demographic factors influence mobile banking services?" have been asked. Innovation diffusion and adoption theories include many constructs and this dissertation have examined eight of them which are relative advantage, observability, compatibility, complexity, image, personal innovativeness, cost and risk. So, these eight critical factors and demographic factors including gender, age, education level, occupation and income level have constituted the independent variables that form the hypotheses.

Quantitative research has been conducted and the delivered survey has included three parts that ask for mobile banking usage habits, critical factors and demographic factors. It is revealed that respondents mostly be aware of mobile banking form their close friends while advertisements and bank personnel take the second and third places as the communication mediums. So, it is concluded that word of mouth is the most effective way when promoting an innovation. It is observed from the result of the survey that respondents who use mobile banking services also use internet banking services and have tendency to abandon bank branches while non-users of mobile banking services also not use internet banking services and usually prefer to go to bank branches. This information also confirms the importance of the compatibility since the past experiences about usage habit of the electronic banking services influences adoption of the future electronic banking service namely mobile banking. Also it is revealed that mobile banking users mostly use smartphones when conducting banking transaction. In addition to that multi device usage is found to be the second preferable way to access banking accounts. And most preferable transactions are stated as money transfer, checking accounts and credit card transactions by the respondents. Reasons for not using mobile banking services are stated as lack of information, security aspect and difficulty of using mobile banking services.

Moreover, factor analyses and logistic regression analyses have showed that most influential factors for the Turkish banking customers are overall advantages, risk including security, economic and performance risk.

This research has showed that mobile banking is in consideration of Turkish banking customers. And it seems to maintain its importance due to the increasing penetration rate of smartphones and due to the expansion of mobile sector in Turkey. In order to help the adoption of mobile banking and to help diffusion of this innovation banks need to pay attention on the advantages and functionality of the services while decreasing risk factors including complexity and security concerns.

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