



# Journal of Internet Banking and Commerce

*An open access Internet journal (<http://www.icommercecentral.com>)*

*Journal of Internet Banking and Commerce, April 2016, vol. 21, no. 1*

## Factors Affecting Customer's Adoption of Mobile Banking Services

---

**AMOLA BHATT**

**Nirma University Institute of Management, Ahmedabad, Gujarat, India,**

**Tel: +91 9825191485**

*Email: [amola@nirmauni.ac.in](mailto:amola@nirmauni.ac.in)*

**SHAHIR BHATT**

**Nirma University Institute of Management, Ahmedabad, Gujarat, India**

---

### **Abstract**

With the rapid advances in technology and changing demographics and life-style of people, the traditional branch banking is giving way to electronic banking (e-banking) and more recently mobile banking (m-banking). However, numbers suggest that the rate of acceptance of technology is quite low. In India, as quoted by an RBI report (Report of the Technical Committee on Mobile Banking, 2014), 64 banks have commenced mobile banking operations and there are 22 million active mobile banking users, which is roughly 5% of the total bank accounts. Lack of awareness, security concerns and technical issues are considered as the major reasons behind customer resistance to mobile banking services. Hence, it is pertinent for the service providers to understand and address the needs of customers so as to optimize their mobile banking experience. The current study aims at describing the usage patterns of mobile banking customers and identifying the factors which influence their usage of m-banking.

For this purpose, a descriptive study was undertaken with a sample size of 200 bank

account holders belonging to public as well as private sector banks, using m-banking. A structured questionnaire was administered on these respondents belonging to Ahmedabad and Gandhinagar districts of Gujarat during the period of January to March 2015. Going by the sample demographics, a typical m-banking customer in India is a young and literate male, belonging to the middle-income strata. The usage patterns of the customers suggest that as the frequency of transactions increases, people prefer the usage of ATMs. Security issues have deterred the customers from resorting to e-banking and m-banking options. Moreover, customers using m-banking find that the advantages lie in time-effectiveness, convenience, safety, operational simplicity and ease of navigation. These help in enriching their mobile-banking experience and have the potential to increase adoption of mobile banking.

**Keywords: Mobile banking; Customer perception; Usage patterns**

© Amola Bhatt, Shahir Bhatt 2016

---

## **INTRODUCTION**

The last two decades have witnessed a technology deluge with the integration of information and communication technology (ICT) in routine transactions at the corporate and retail level. Several reasons can be attributed to this phenomenon, ranging from cost-effectiveness on the part of service providers to convenience and time-effectiveness on the end of consumers. Suoranto [1] has confirmed that factors contributing to the adoption of mobile banking are related to convenience, access to the service regardless of time and place, privacy and savings in time and effort. However, the fact is that the adoption of new technology is not growing at the same pace as the introduction of the same. Consumers are refraining from using these technologically advanced services, partly because of lack of awareness and partly due to other concerns of security, device functionality, etc. Mobile banking, which allows the user to perform financial transaction using a mobile device, is not an exception to resistance faced from consumers. Weisbaum [2] quotes that 86% of the people who did not use mobile banking services in US were of the opinion that their banking needs were being met without mobile banking and nearly two-thirds of people who did not use mobile banking cited security concerns, such as data interception, phone hacking or lost phone. Another article by Marous [3] states that 22% people owning mobile phones and having a bank account were not aware of mobile banking. In India, as quoted by an RBI report [4], 64 banks (out of 80 permitted banks) have commenced mobile banking operations and there are 22 million active mobile banking users (out of 30 million subscribed as of October 2013). However, customer enrollment related issues like mobile number registration, M-PIN generation process, security-related concerns, bank-staff education and customer awareness and education, and technical issues faced by banks including access channels for transaction, cumbersome transaction process and coordinating with Mobile Network Operators (MNOs) in mobile-banking eco-system are

inhibiting the adoption of mobile banking.

But, all is not lost as this report foresees a bright future for mobile banking, provided the issues are sorted out. The report displays a growing trend of mobile banking with the volume and value of transactions having risen at 108.5% and 228.9% from Financial Year 2012 to 2013 respectively. Reserve Bank of India (RBI) further reports that there were around 870 million mobile connections in India by June, 2013 and around 450 million bank accounts. Hence, the scope of mobile banking is bound to increase and it shall also serve as a tool for financial inclusion by bringing unbanked people with mobile phones in the rural areas in the net. As per International Data Corporation (IDC) [5] estimates, the smartphone usage in India will increase at a CAGR of 36% from 2014 to 2019 amounting to 651 million smartphone users. This by itself manifests as a growth opportunity for mobile banking as it is found that most of the growth in mobile banking users directly stems from smartphone purchases [3]. Hence, at this juncture it becomes pertinent to know the customer segment using mobile banking along with their usage patterns and to further map their perceptions, so that improvisations in the service can be made and the reach can be increased. Such studies in the Indian context are few in number and hence, this study will address a knowledge gap in this field of study. Moreover, the study goes beyond and attempts to draw a relation between certain demographic characteristics of m-banking users and their perceptions, so that appropriate communication strategy can be used for the target audience. Thus, the study will give an empirically drawn observation on m-banking users' perceptions towards the service and help the banks in increasing the penetration by focusing on the factors drawn out of this study, especially in the context of a fast developing country like India.

## **LITERATURE REVIEW**

### **Mobile banking model and services**

The mobile banking platform combines payments, banking, and real-time, two-way data transmission for on-the-move, ubiquitous access to financial information and services [6]. Mobile banking is the financial service innovation offered through the use of Information and Communications Technology (ICT) [7]. Mobile Banking can be broadly classified into Bank-led model and Mobile Service Provider Led Model. In the bank led model, only customers of a bank can avail the mobile banking service from the bank and perform various banking activities. While, in the Mobile Service Provider Model, unbanked customers can also perform banking transactions through their mobile service provider.

Mobile banking services can be classified into SMS Banking, Application (Software) oriented, Browser (Internet) based model and Mobile Apps. The common activities which can be performed through mobile banking are balance enquiry, mini statement, money transfer, payment of bills, etc.

## **Awareness level of mobile banking**

Devadevan [8] conducted a survey on 65 respondents, and found that 84.6% of the same had tested the mobile banking facility while the rest were unaware of the same. Li [9] points out a low level of awareness in China as far as mobile banking was concerned. In view of the same, Laukkanen [10] tested the impact of information and guidance offered by the bank. They found that the information and guidance offered by a bank has the most significant effect on perceived functional usability of mobile banking and also significantly increases the positive image associated with the innovation. The results also suggested that information and guidance significantly increase the perceived value added provided by mobile banking and decrease the perceived risks related to the innovation. However, information and guidance have no significant impact of psychological barriers like tradition.

## **Effect of demographics on usage of mobile banking**

It is usual to include demographics characteristics in models about technology use and adoption [11]. The impact of demographics on the adoption of various electronic devices has been extensively studied [12]. Howcroft et al. [13] revealed that younger consumers value the convenience or time saving potential of online and mobile banking more than older consumers. These authors further found the educational levels of respondents did not affect the use of telephone or online banking. Capgemini [14], Goh [15] and Laukkanen [12] also found that younger customers, who are more technology savvy, are placing greater importance on mobile banking than senior people. Karjaluoto et al. [16] found a typical user of online banking in Finnish market highly educated, relatively young and wealthy person with good knowledge of computers and, especially, the internet. Li [9] noted that a typical user of mobile banking in China was male, aged upto 44 years and belonged to the high-income group. Further, respondents' level of education was not found to influence mobile banking adoption in China. According to Crabbe [17], demographic factors play a significant role in adoption decisions. They find that social and cultural factors, such as perceived credibility, facilitating conditions, perceived elitism, and demographic factors, significantly affect adoption decisions for m-banking in Ghana. Similarly, a survey conducted in Malaysia [18] reveals that both demographic and psychographic variables affect the adoption of new innovations such as m-banking—in particular, age, gender, personal income, and education. Finally, in their investigation of the influence of demographic factors on the adoption of m-banking and its applications, Teo [19] also incorporate demographic factors and subjective norms with the Technology Adoption Model (TAM) to assess intentions to adopt in Malaysia. As indicated by Goswami [20] Mobile-savvy college students, who are using their mobile devices for services beyond voice, will drive adoption of innovative mobility services, including mobile banking. Similarly, a study conducted by KPMG [21] found that mobile phone users aged between 16 and 34 were most comfortable using mobile

phones for financial transactions, while majority of respondents in 65 and above age group were not at all comfortable.

### **Customer's adoption of technology in banking**

There are various studies which highlight the customer adoption of technology in banking and map their satisfaction levels thereof. A study done by Polatoglu [22] indicates that early adopters and heavy users of internet banking were more satisfied with this service compared to other customers. Others also argued that the delivery of technology services appears to be correlated with high satisfaction where these services were most important to customers [23]. Efficiency, convenience and safety were viewed as desired end-state goals when using mobile banking [24]. Chung [25] found that system and information quality significantly influenced customer satisfaction, while information presentation did not significantly influence customer satisfaction. Also, trust can play a crucial intervening role in the relationship between perceived value (system and information quality) and customer satisfaction. In a recent study conducted on adoption of m-banking in China among customers of four state owned banks of China, ease of use was found to have significant impact on trust [26]. Chen [27], in their attempt to examine the effect of perceived risk on the adoption of Mobile Banking, found it as the key factor affecting attitude. Perceived usefulness has been found to have a significant positive effect on both attitude and usage intention toward use of Mobile Banking Services [11,28]. Thakur [29] found that mobile interface usability (quick response time and easy navigation) and service had a positive effect on customer satisfaction. The results also confirmed that loyalty of m-banking customers was directly affected by satisfaction from m-banking services. On similar lines, a study by Deb [30] also found that perceived usefulness, perceived ease of use and social influence were related to positive attitude towards m-banking. Moreover, a positive relationship existed between attitude towards m-banking and intention to adopt m-banking. These results coincided with the findings of Chen [27] who reported that consumers who enjoyed wireless banking transactions and those who found mobile-banking services easy to use displayed a positive attitude towards usage of mobile banking. Lee et al. [31] point out that once service providers are able to deliver user friendly, and consumer-satisfying services, then Mobile Banking will be adopted by consumers.

### **Issues and challenges**

The major reasons behind non-usage of mobile banking were security concerns and technical problems of getting the MPIN [8]. Similar results were noted by Li [9], who stated that among security concerns, hackers and fraud were responsible for non-adoption of online and mobile banking in China. This is also proved in studies done by Brown [31], Luarn [33], Chen [27]. Moreover, Chen [27] claims that frequent users of mobile banking were more concerned with psychological risks and the infrequent users were more concerned with financial risk as well as psychological risk. Previous studies indicate that perceived financial cost [33] and perceived complexity [34] inhibits the use and adoption of mobile banking services. Suoranta [1] found that mobile services were

not used since they were perceived as impractical and not sufficiently diversified. In the case of the mobile phone, the small screen with small amount of information makes the device very difficult to use in fund transfer [35]. According to a study conducted by KPMG [21], respondents mentioned that their decision to use m-banking in future would depend on security or privacy and ease of use.

### **Objectives**

- To study the usage pattern of mobile banking services
- To determine the factors which influence the adoption of mobile banking services
- To find relationship, if any between the demographics, usage pattern and the factors brought out from the study

## **RESEARCH METHODOLOGY**

The research design for the study is descriptive in nature and the sampling unit were people having a bank account and using mobile banking services. The total sample size was 200, of which, deliberately, equal number of public bank account holders and private bank account holders were sampled. The questionnaire constructed for the study included several questions which were continuous and categorical in nature. The survey consisted of three sections, wherein the first section reported the demographic details, the second section explored the usage pattern and knowledge about mobile banking services, and the third section comprised of variables of mobile banking service and their agreement levels thereof. The scale pertaining to measuring perceptions of mobile banking consumers was adopted from a Dissertation by A. Prameela [36] and the relevant statements were retained for the current study. These statements were measured on a 5-point Likert scale ranging from highly agree to highly disagree. This questionnaire was administered on 200 respondents in the cities of Ahmedabad and Gandhinagar in Gujarat state. Using convenience sampling, the survey was conducted from January 2015 to March 2015. Convenience sampling is a type of non-probability sampling method and it involves collecting data from respondents who are a part of the population as desired under the study and are conveniently available to participate in the study. However, care was taken that the selected respondents were holding a bank account and using mobile banking services.

## **DATA ANALYSIS AND INTERPRETATION**

### **Demographic details of the respondents**

People who used mobile banking formed the sample, which also gives a general idea on the demographics of consumers of mobile banking in Gujarat. Almost 73% of the respondents belonged to the age-group of 18-25 years and 77% of the sample were males. About 73% of the respondents were graduates, suggesting that most consumers of mobile banking were literate. Also, majority respondents were students (44%), followed by people engaged in private sector (33%). Majority of the respondents earned

below Rs. 10,000 (48%) followed by earnings in the range of Rs. 10,000 to Rs. 30,000 (41%). This might be the case as a significant part of the sample comprised of students. About 56% of the respondents were married, with the balance being unmarried (Table 1,2).

Table 1: Demographics of the respondents

Demographic factors		Frequency	Percentage
Age	18 – 25	147	73.5%
	26 – 30	40	20.0%
	31 – 40	8	4.0%
	41 – 50	5	2.5%
Gender	Male	154	77.0%
	Female	46	23.0%
Education	Under-graduate	7	3.5%
	Graduate	147	73.5%
	Post-graduate	46	23.0%
Occupation	Govt. employee	17	8.5%
	Private service	66	33.0%
	Business	20	10.0%
	Student	89	44.5%
	House-wife	8	4.0%
Monthly income	Below 10,000	97	48.5%
	10000 - 30000	83	41.5%
	30000 - 50000	15	7.5%
	Above 50,000	5	2.5%
Marital Status	Married	113	56.5%
	Unmarried	87	43.5%

Source: Primary data collected through questionnaire

Table 2: Banking related information of the respondents

Bank details		Frequency	Percentage
Name of Bank	SBI	49	24.5%
	BOB	52	26.0%
	ICICI	49	24.5%
	HDFC	50	25.0%
Operation of Bank Account	Self	197	98.5%
	Others	3	1.5%
Type of Bank Account	Savings	180	90.0%
	Current	11	5.5%
	Both	9	4.5%

Source: Primary data collected through questionnaire

### **Banking related information of Respondents**

As mentioned in the previous section, almost equal number of respondents was chosen from the leading public sector and private sector banks of India. The State Bank of India and Bank of Baroda were chosen from the public sector, while ICICI and HDFC banks were chosen from the private sector. The statistics reveal that almost all respondents self-operated their bank account and 90% of the respondents held Savings accounts with these banks.

### **Usage frequency of Respondents**

The above table reports the usage frequency of various modes of banking available to the customers. For majority respondents, branch banking, internet banking, telephone banking and mobile banking invite less than 3 visits every month. However, respondents frequently visit the ATMs for conducting banking transactions. Branch banking is losing its appeal in light of technological advancements. However, security and operational issues have also deterred the usage of internet and phone / mobile banking. Hence, as a mid-way option, customers prefer using ATMs for common



transactions (Table 3).

Table 3: Usage frequency of the respondents

Usage frequency per month	< 3 times		4 – 8 times		> 8 times	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Branch Banking	164	82.0%	32	16.0%	4	2.0%
ATM Banking	91	45.5%	100	50.0%	9	4.5%
Internet Banking	137	68.5%	54	27.0%	9	4.5%
Telephone (Landline) Banking	186	93.0%	13	6.5%	1	0.5%
Mobile Banking	148	74.0%	44	22.0%	8	4.0%

Source: Primary data collected through questionnaire

### Factors affecting customers’ adoption of Mobile banking services

To determine the important factors affecting the usage of mobile banking, the factorability of 18 items was examined, and the respondents were asked to rate these variables using a 5-point Likert scale, which ranged from ‘strongly disagree’ to ‘strongly agree’. Firstly, the internal consistency of the items was checked using Cronbach’s alpha. The Cronbach’s alpha value came to 0.817 for the entire scale of 18 items which was considered to be excellent, as the closer the reliability coefficient gets to the value of 1 the better is the reliability of the measures. Moreover, deletion of any item could not significantly improve the reliability results. Next, the Bartlett’s test of sphericity was found to be significant (Chi-Square 1203.615, p-value < 0.0001). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was high at 0.823. The KMO value of 0.823 was excellent since it exceeded the recommended value of 0.6. The two results of (KMO and Bartlett’s) suggested that the data was appropriate to proceed with the factor analysis using all the 18 items of the scale. The principal component analysis with varimax rotation was used as the basic idea was to identify the factors, thereby narrowing the scope and computing factor loadings for the same.

Exploratory factor analysis (EFA) was performed and it was found that all the items

carried an eigenvalue of more than 1. Hence, all the factors were retained as they were considered significant to the study. The result was that there were a total of 5 factors, which explained 57.09% of the total variance. The Table 4 gives the rotated component matrix dimensions for better understanding of the factors.

Table 4: Factors influencing customers for adoption of mobile banking services

	1	2	3	4	5
<b>Factor 1: Time-effective</b>					
The current software enables m-banking smoothly	0.716				
Login process is fast	0.769				
Bill payment can be done in less time	0.749				
Service charges are reasonable	0.798				
Clearing services are fast	0.670				
<b>Factor 2: Convenience</b>					
Prepaid mobile recharge can be done easily		0.709			
Transaction Status can be known easily		0.633			
Secure transactions		0.563			
<b>Factor 3: Safety</b>					
Bill payments is secure			0.649		
Account to account transfer is secure			0.618		
Statement request can done easily			0.676		
Disallows third party tampering			0.599		
<b>Factor 4: Operational simplicity</b>					
SMS alerts about specific				0.503	

information					
Fast responses				0.538	
Simple steps in processing				0.764	
Less possibilities of hacking				0.652	
<b>Factor 5: Ease of navigation</b>					
Less waiting time					0.757
Login/signoff are easy					0.623

Source: Primary data collected through questionnaire

Factor 1 has an eigenvalue of 5.602 and has five variables clubbed under it. This factor can be labelled as “time-effective” as the underlying variables indicate the benefits of using mobile banking in saving time, like faster logins, bill payments and clearing services. At the same time, it also indicates the smooth functioning of this platform. The items received a mean score of 2.28 on a scale of 1 to 5 where majority agreed that mobile banking services are time-effective and this factor can influence the usage of the same.

Factor 2 labelled as “Convenience”, having an eigen value of 2.278 reflects the ease of conducting various transactions using mobile banking. This factor clubs statements like ease of performing mobile recharges, knowing the status of transactions. The items received a mean score of 1.93 on a scale of 1 to 5 where majority agreed that convenience can be an important factor in adoption of mobile banking. This finding is supported by Mathew [37] who found that usefulness and facilitating conditions had the most influence in discriminating between mobile banking user and non-user.

Factor 3 has an eigenvalue of 1.302 and has four variables clubbed under it. This factor can be termed as “Safety” since it primarily talks about the security features offered by mobile banking. The variables under this factor talk about security in bill payments, transfer of funds, account statements and disallowance of third party tampering. The items received a mean score of 1.94 on a scale of 1 to 5 where majority agreed that contrary to traditional views, mobile banking ensures adequate safety measures and this feature should be publicized so as to gain greater acceptance among non-users. This finding is in line with a study conducted by Singh [38], which states that factors influencing customer perceptions of mobile banking can be labelled as security/privacy, reliability, efficiency and responsiveness.

Factor 4 loaded on four variables carries an eigen value of 1.268 and is labelled as “Operational Simplicity”. The underlying variables portray the processes involved in mobile banking and their corresponding simplicity. These variables relate to SMS alerts about specific information, faster responses, simpler steps in processing and fewer possibilities of hacking. The items received a mean score of 1.97 on a scale of 1 to 5

where majority agreed that operational simplicity could influence people in adopting m-banking. Olasina [39] finds a positive correlation between perceived ease of use and adoption of m-banking.

Factor 5 has an eigenvalue of 1.091 and has two variables clubbed under it. This factor can be termed as “Ease of Navigation” as it comprises of statements which indicate less waiting time and ease of login and signoff. The items received a mean score of 2.07 on a scale of 1 to 5 where majority agreed that in addition to simpler operational steps, ease of navigation is critical for adoption of m-banking. On similar lines, a study by Yu [40] indicates security, interactivity, relative advantage, ease of use and interface creativity as determinants affecting the perceptions of customers post-adoption of mobile banking services.

## Hypothesis testing

The study tested the following hypothesis:

### Hypothesis 1

Ho: There is no significant relationship between factors influencing m-banking adoption and the demographics

H1: There is significant relationship between factors influencing m-banking adoption and the demographics

One-way ANOVA (analysis of variance)/ independent sample t-test is used to test the hypothesis. On a variable of interest, ANOVA tests the significance of differences between two or more groups, while t-test looks at differences between two groups. Of the independent variables relating to demographics, gender and marital status contain only two groups each while the other variables like age, occupation and monthly income consist of more than two categories. Hence, t-test is applied for gender and marital status, while ANOVA is used for the remaining variables. Data is normally distributed and homogeneity of variance is checked using Levene’s statistic which can be seen in Table 5. Post-hoc tests (Tuckey/Games Howell) are also carried out to further analyze the data wherever significant relationship is established.

- Time-effective and Occupation: The assumption of homogeneity of variance is violated and therefore, the Welch F-ratio is reported. There is a statistically significant difference between groups as determined by Welch ( $F(4,195) = 3.19, p = 0.025$ ). The null hypothesis can be rejected here. The Games-Howell post-hoc test does not rely on homogeneity of variance and so this was chosen. This test revealed that time-effectiveness is statistically higher for students ( $2.44 \pm .799$ ) than for people engaged in private service ( $2.06 \pm .556$ ). It can be concluded that for the given data there is a relationship between time-effectiveness and occupation. It can be stated that people occupied in private service believe that savings in time benefit can be a critical factor influencing the usage of mobile banking.

- Time-effective and Monthly Income: The assumption of homogeneity of variance is violated and therefore, the Welch F-ratio is reported. There is a statistically significant difference between groups as determined by Welch ( $F(3,196) = 6.67, p = 0.003$ ). The null hypothesis can be rejected here. The Games-Howell post-hoc test revealed that time-effectiveness is statistically higher for people with monthly income below Rs. 10,000 ( $2.39 \pm .769$ ) than for people in the income-bracket of Rs. 31000-50000 ( $1.99 \pm .480$ ) as well as for people with income higher than Rs. 50000 per month ( $1.68 \pm .335$ ). It can be concluded that for the given data there is a relationship between time-effectiveness and monthly income. It can be stated that people belonging to higher income brackets believe that savings in time benefit can be a critical factor influencing the usage of mobile banking.
- Time-effective and Gender: The results of Independent Sample t-test ( $t = 2.229, p = 0.028$ ) confirm that there exists a relationship between time-effectiveness and gender. Further, the descriptive statistics confirmed that time-effectiveness is statistically higher for males ( $2.33 \pm .748$ ) than females ( $2.11 \pm .539$ ). Hence, it can be stated that females perceive time-effective mobile banking services could be a more influential factor in adopting the same.
- Time-effective and Marital Status: The results of Independent Sample t-test ( $t = -3.011, p = 0.003$ ) confirm that there exists a relationship between time-effectiveness and marital status. Further, the descriptive statistics confirmed that time-effectiveness is statistically higher for unmarried people ( $2.46 \pm .803$ ) than for married people ( $2.15 \pm .600$ ). Hence, it can be stated that married people perceive time-effectiveness to be an important factor behind influencing people to use mobile banking services.

Table 5: Relationship of Factors with Demographics

		Age	Educational	Occupation	Monthly Income	Gender	Marital Status
Time-effective	Levene Statistic	1.613	2.106	2.695	2.703	3.995	9.812
	Levene Sig. <sup>1</sup>	0.188	0.124	0.032	0.047	0.047	0.002
	ANOVA/Welch F Statistic <sup>2</sup>	0.915	2.873	3.190	6.668		
	ANOVA/Welch	0.434	0.059	<b>0.025</b>	<b>0.003</b>		

	Sig <sup>3</sup>						
	t- statistic					2.229	-3.011
	t sig					<b>0.028</b>	<b>0.003</b>
	Ho Rejecte d	No	No	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Convenience</b>	Levene Statistic	1.215	1.554	1.653	0.593	5.119	0.707
	Levene Sig.	0.305	0.214	0.163	0.621	0.025	0.401
	ANOVA/ Welch F Statistic	0.530	0.106	1.174	0.518		
	ANOVA/ Welch Sig	0.662	0.899	0.324	0.670		
	t- statistic					-0.490	0.150
	t sig					0.626	0.881
	Ho Rejecte d	No	No	No	No	No	No
<b>Safety</b>	Levene Statistic	2.141	0.426	2.403	1.754	0.003	0.209
	Levene Sig.	0.096	0.654	0.051	0.157	0.959	0.648

	ANOVA/ Welch F Statistic	0.159	3.014	0.991	1.893		
	ANOVA/ Welch Sig	0.924	0.051	0.414	0.132		
	t- statistic					0.022	-1.441
	t sig					0.983	0.151
	Ho Rejecte d	No	No	No	No	No	No
<b>Operation al Simplicity</b>	Levene Statistic	1.688	0.110	0.652	1.270	0.064	1.055
	Levene Sig.	0.171	0.896	0.626	0.286	0.800	0.306
	ANOVA/ Welch F Statistic	2.505	0.084	1.385	0.881		
	ANOVA/ Welch Sig	0.060	0.919	0.240	0.452		
	t- statistic					0.273	0.510
	t sig					0.785	0.611
	Ho Rejecte d	No	No	No	No	No	No
<b>Ease of Navigation</b>	Levene Statistic	0.679	0.386	0.559	1.042	0.022	0.298

	Levene Sig.	0.566	0.680	0.693	0.375	0.883	0.586
	ANOVA/ Welch F Statistic	0.694	2.057	1.279	0.979		
	ANOVA/ Welch Sig	0.557	0.131	0.280	0.404		
	t- statistic					1.057	-1.658
	t sig					0.292	0.099
	Ho Rejected	No	No	No	No	No	No

Source: Primary data collected through questionnaire

<sup>1</sup>Levene’s test is used for determining the homogeneity of variances. In the given table, the significance value of Levene’s test is shown. If this significance value is less than 0.05, the null hypothesis of equal variances is rejected.

<sup>2</sup>ANOVA test indicates whether there is an overall difference between the groups. However, it can only be used if the data meets the assumption of homogeneity of variance (as indicated by Levene’s test). If the data does not satisfy the assumption of homogeneity of variance, Welch F-test is run to identify the overall difference between the groups. The t-test is also used to find the difference between the groups, when the groups are limited to two. In this case for “gender” and “marital status”, t-test is run as groups are only two. If the groups exceed two, then ANOVA is used. The statistics in this row relate to ANOVA or Welch F or t-test as applicable under the given constraints.

<sup>3</sup>The significance value given in this row is used to accept or reject the null hypothesis tested using ANOVA or Welch or t-test.

**Hypothesis 2**



Ho: There is no significant relationship between the type of bank ownership and factors influencing m-banking adoption

H1: There is significant relationship between the type of bank ownership and factors influencing m-banking adoption

Independent sample t-test is used to test the hypothesis, as it looks at differences between two groups on a variable of interest. In the current context, bank ownership was classified as public and private. Data is normally distributed and homogeneity of variance is checked using Levene’s statistic which can be seen in Table 6.

Table 6: Relationship of Factors with Type of bank ownership

Factors	Levene Statistic	Levene Sig.	t-statistic	t sig	H0 Status	Mean Values	
						Public Bank	Private Bank
Time-effective	26.055	0.000	7.303	0.000	Rejected	2.62	1.96
Safety	0.362	0.548	3.073	0.002	Rejected	2.05	1.83
Convenience	0.000	0.998	2.385	0.018	Rejected	2.02	1.84
Operational Simplicity	0.521	0.471	3.011	0.003	Rejected	2.08	1.85
Ease of navigation	0.378	0.539	2.764	0.006	Rejected	2.19	1.95

Source: Primary data collected through questionnaire

The test results make it evident that all the factors brought out from the study which influence a respondent to adopt mobile banking bear a statistically significant relationship with the type of bank ownership. It needs to be recalled here that deliberately equal number of respondents were taken from both the categories of banks, so as to remove the bias created by the sample size. Further analysis of the descriptives reveals that consumers of private banks perceive the factors, viz. time-effective, safety, convenience, operational simplicity and ease of navigation as potential drivers for adoption of mobile banking. Hence, it can be suggested that public sector banks need to improve their customer experience of m-banking services.

**Hypothesis 3**

Ho: There is no significant relationship between the frequency of using mobile banking and factors influencing m-banking adoption

H1: There is significant relationship between the frequency of using mobile banking and factors influencing m-banking adoption

One-way ANOVA (analysis of variance) is used to test the hypothesis, as it tests the significance of differences between two or more groups on a variable of interest. Data is normally distributed and homogeneity of variance is checked using Levene’s statistic which can be seen in Table 7. In the cases, where the assumption of homogeneity of variance is violated, Welch F is used as an alternative. Post-hoc tests (Tuckey/Games Howell) are also carried out to further analyze the data wherever significant relationship is established.

Table 7: Relationship of Factors with Frequency of using mobile banking

<b>Factors</b>	<b>Levene Statistic</b>	<b>Levene Sig</b>	<b>F / Welch Statistic</b>	<b>Sig.</b>	<b>H0 Status</b>
<b>Time-effective</b>	11.109	0.000	17.464	0.000	Rejected
<b>Safety</b>	1.165	0.314	4.808	0.009	Rejected
<b>Convenience</b>	0.164	0.849	4.044	0.019	Rejected
<b>Operational Simplicity</b>	0.724	0.486	5.648	0.004	Rejected
<b>Ease of navigation</b>	0.881	0.416	3.609	0.029	Rejected

Source: Primary data collected through questionnaire

The above results suggest that the null hypothesis is rejected for all the factors and there is a significant relationship between frequency of usage of mobile banking and factors influencing the adoption of m-banking. The post-hoc tests further suggest that in the case of time-effective, operational simplicity and ease of navigation, people using mobile banking for 4 to 8 times in a month agree more than people using mobile banking for less than 3 times. On similar lines, people using mobile banking for more than 8 times a month on an average believe safety and convenience to be critical factors affecting the adoption of m-banking, as compared to people using m-banking for less than 3 times. Hence, it can be inferred that respondents using mobile banking more frequently perceive that the above-mentioned factors can actually rope in people to adopt m-banking as an alternative channel of banking. This inference assumes importance as the heavy users would have experienced the benefits of m-banking and their responses are more authentic.

**CONCLUSION**

The market for mobile phones, especially the smart phones is assuming great heights and the banks want to ride on this growth by offering mobile banking as an alternative channel of providing services. However, consumers are wary of the new technology and literature is replete with papers which discuss the initial resistance exhibited by consumers towards technological developments. As a matter of fact, the usage pattern reveals that people frequent ATMs more than using internet banking or mobile banking. In light of this, the current study offers insights on the perceptions of mobile banking users and tries to unearth the factors which could influence more people into adopting mobile banking. The factors brought out from the study are labelled as Time-effective, Safety, Convenience, Operational simplicity and Ease of navigation. Additionally, it was revealed that users who were females, engaged in private sector, belonged to high income class, and were married stated time-effectiveness to be a critical factor for influencing the usage of m-banking. Respondents holding accounts in private banks could relate to all the factors as being important for adoption of m-banking. Similarly, frequent users of mobile banking could also identify with the above-mentioned factors and agreed that these could be the driving forces for increasing the reach of m-banking in the region. Hence, spreading awareness about m-banking based on these factors would certainly help the banks.

## REFERENCES

1. Suoranta M (2003) Adoption of mobile banking in Finland. Doctoral thesis, Jyväskylä, Finland,
2. Weisbaum H (2015) Why has Mobile banking growth stalled? Blame Hackers.
3. Marous J (2015) Has Mobile Banking Usage Reached a Plateau? The Financial Brand.
4. (2014) Report of the Technical Committee on Mobile Banking. RBI.
5. <http://www.slideshare.net/zinnov/smartphone-market-in-india>
6. Jacob K (2007) Are mobile payments the smart cards of the aughts? Federal Reserve Bank of Chicago, Chicago.
7. Mishra V, Bisht SS (2013) Mobile banking in a developing economy: A customer-centric model for policy formulation. Telecommunications Policy 37: 503-514.
8. Devadevan V (2013) Mobile Banking in India – Issues and Challenges. International Journal of Emerging Technology and Advanced Engineering 3: 516-520.
9. Laforet S, Xiaoyan Li, (2005) Consumers' attitudes towards online and mobile banking in China. International Journal of Bank Marketing 23: 362-380.
10. Laukkanen T, Kiviniemi V (2010) The role of information in mobile banking

resistance. *International Journal of Bank Marketing* 28: 372-388.

11. Shaikh AA, Karjaluoto H (2015) Mobile banking adoption: a literature review. *Telematics and Informatics* 32: 129-142.

12. Laukkanen T, Cruz P (2012) Cultural, individual and device-specific antecedents on mobile banking adoption: a cross-national study. *Proceedings of the 45th IEEE Hawaii International Conference on System Sciences (HICSS), Hawaii*.

13. Howcroft B, Hamilton R, Hewer P (2002) Consumer attitude and the usage and adoption of home-based banking in the United Kingdom. *International Journal of Bank Marketing* 20: 111-121.

14. Capgemini (2013) World retail banking report. *European Financial Management and Marketing Association*.

15. Goh TT, Suki NM, Fam K (2014) Exploring a consumption value model for Islamic mobile banking adoption. *Journal of Islamic Marketing* 5: 344-365.

16. Karjaluoto H, Mattila M, Pentto T (2002) Factors underlying attitude formation towards online banking in Finland. *International Journal of Banking Marketing* 20: 261-272.

17. Crabbe M, Standing C, Standing S, Karjaluoto H (2009) An adoption model for mobile banking in Ghana. *International Journal of Mobile Communication* 7: 515-543.

18. Sulaiman A, Jaafar NI, Mohezar S (2007) An overview of mobile banking adoption among the urban community. *Int J Mobile Commun* 5: 157-168.

19. Teo A, Tan GW, Cheah C, Ooi K, Yew K (2012) Can the demographic and subjective norms influence the adoption of mobile banking? *International Journal of Mobile Communication* 10: 578-597.

20. Goswami D, Raghavendran S (2009) Mobile-banking: can elephants and hippos tango? *Journal of Business Strategy* 30: 14-20.

21. (2009) Consumer taking charge, consumers and convergence III – survey report. *KPMG International*.

22. Polatoglu VN, Ekin S (2001) An empirical investigation of the Turkish consumers' acceptance of internet banking services. *International Journal of Bank Marketing* 19: 156-165.

23. Joseph M, Stone G (2003) An empirical evaluation of US bank customer perceptions of the impact of technology on service delivery in the banking sector.

International Journal of Retail and Distribution Management 31: 190-202.

24. Laukkanen T (2007) Internet vs mobile banking: comparing customer value perceptions. *Business Process Management Journal* 13: 788-797.
25. Chung N, Kwon S (2009) Effect of trust level on mobile banking satisfaction: a multi-group analysis of information system success instruments. *Behaviour and Information Technology* 28: 549-562.
26. Zhou T (2012) Examining mobile banking user adoption from the perspectives of trust and flow experience. *Information Technology and Management* 13: 27-37.
27. Chen C (2013) Perceived risk, usage frequency of mobile banking services. *Managing Service Quality: An International Journal* 23: 410-436.
28. Purwanegara M, Apriningsih A, Andika F (2014) Snapshot on Indonesia regulation in mobile internet banking users attitudes. *Procedia – Social and Behavioral Sciences* pp: 147-155.
29. Thakur R (2014) What keeps mobile banking customers loyal? *International Journal of Bank Marketing* 32: 628-646.
30. Deb M, Lomo-David E (2014) An empirical examination of customers' adoption of m-banking in India. *Marketing Intelligence and Planning* 32: 475-494.
31. Lee H, Harindranath G, Oh S, Kim DJ (2015) Provision of mobile banking services from an actor-network perspective: implications for convergence and standardization. *Technological Forecasting and Social Change* 90: 551-561.
32. Brown I, Cajee Z, Davies D, Stroebel S (2003) Cell phone banking: predictors of adoption in South Africa – an exploratory study. *International Journal of Information Management* 23: 381-394.
33. Luarn P, Lin HH (2005) Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior* 21: 873-891.
34. Lee MSY, McGoldrick PF, Keeling KA, Doherty J (2003) Using ZMET to explore barriers to the adoption of 3G mobile banking services. *International Journal of Retail and Distribution Management* 31: 340-348.
35. Laukkanen T, Sinkkonen S, Kivijarvi M, Laukkanen P (2007) Innovation resistance among mature consumers. *Journal of Consumer Marketing* 24: 419-427.
36. Prameela (2013) Technology in banking: an impact study in the operations of public and private sector banks with reference to Andhra Bank and ICICI bank – Vizag city. Shoshganga.

37. Mathew M, Sulphay MM, Prabhakaran J (2014) Perceptions and Intentions of Customers towards Mobile Banking Adoption. *Journal of Contemporary Management Research* 8: 83-101.
38. Singh S (2014) Customer Perception of Mobile Banking: An Empirical Study in National Capital Region Delhi. *Journal of Internet Banking and Commerce* 19: 1-22.
39. Olasina G (2015) Factors Influencing the Use of M-Banking by Academics: A Case Study of SMS-Based MBanking. *African Journal of Information Systems* 7: 56-79.
40. Yu T, Fang K (2009) Measuring the Post-Adoption Customer Perception of Mobile Banking Services. *Cyberpsychology and Behavior* 12: 33-35.