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Adoption and Challenges of Mobile Banking Systems in Ethiopia: The Case of Cooperative Bank of Oromiya

by: Ebisa Beyene (M.Sc. in Information Sciences from AAU, 2017)

Abstract

The incorporation of information system into organizations for the purpose of getting competitive advantage, easing workload, providing intangible (soft) work place and coping up with technological advancement has become an indispensable for organizations. Due to these many companies (like banks) are getting advantages of information communication technology implementation like Mobile Banking (M-banking), Internet banking, Automatic Teller Machine, etc. Accordingly Ethiopian commercial banks have implemented M-banking system into their service system. This research examine adoption of M-banking system in Ethiopia focusing on Cooperative bank of Oromiya with respect to the challenges which can influence the bank from taking advantage and expected benefits of M-banking system derived by adopting the system. The result of the research indicated that, drivers of M-banking are relative advantage, perceived ease of use and perceived usefulness while challenges are perceived risks, trust reliability and lack of ICT infrastructure.

Keywords: Mobile Banking, Information System and Technology Adoption

1. Introduction

In modern economy, a strong and powerful financial system is a pillar of economic growth and development. The availability of banking facilities and unfolding banking service outreach are the major facilitators of developmental and expansionary activities (Sumanjet, 2010). In this regard, information technology plays a key role in promoting inclusive financial system as it is the only way to reduce the cost significantly and reach the masses. But all technologies are not suitable for financial inclusion due to affordability, accessibility, security and privacy. In the last decades, mobile phone technology has emerged as the most potential and well suited channel for financial inclusion and use of mobile phone for inclusive finance is very popular in countries where most of the population is unbanked or under-banked (Sumanjeet, 2010).

Most M-banking systems in the developing world enable users to do three-things; first is to store value or currency in an account accessible via the handset. If the user already has a bank account, this is simply linking to a bank account, if the user does not have an account, then the process creates a bank account for him/ her or creates a pseudo bank account, held by a third party or the user's mobile operator. Second is to convert cash in and out of the stored value account. If the account is linked to a bank account, then users can visit banks to cash-in and cash-out. In the most flexible services, a user can visit a corner kiosk or grocery store, perhaps the same one where he or she purchases airtime and transact with an independent retailer working as an agent for

the transaction system. Third is to transfer stored value between accounts. Users can generally transfer funds between accounts linked to two mobile phones, by using a set of SMS's or menu commands and PIN numbers (Donner, et al, 2008).

Mobile phones have increasingly become tools that consumers use for banking, payments, budgeting, and shopping (USDE, 2014) and banks strive to understand customers' e-behaviors worldwide (Alsajjan and Dennis, 2009). Since M-Banking is a service offered by banks or other financial institutions for non-cash transactions through mobile telecommunication devices for their customers, assessing the adoption and challenges of the system is required.

This research focuses to provide an insight into adoption and challenges of M-Banking for both customers and the bank. It also gives good customer reliance on the use of M-Banking system and identifies challenges that affect the adoption of M-Banking system. The general objective of the research is to investigate and analyze the adoption and challenges of M-Banking (hello-cash) system while the specific objectives of the research are:-

- To identify the adoption of M-Banking system from the bank and customers' side.
- To identify the challenges of M-Banking system from the bank and customers' side.

2. Review of Literature and Related Works

2.1. Mobile Banking Adoptions in Ethiopia

The growing competition and increasing expectations led to increased awareness amongst banks on the role and implementation of technology in banking, forcing banks to go in for the latest technologies so as to meet the threat of competition and retain their customer base (Prema, 2010). There are a lot of benefits through adoption of M-Banking for the banks and their customers. M-Banking increases operational efficiencies and reduce costs, besides giving a platform for offering value added services to the customer, thereby fulfilling all the essential prerequisites for flourishing banking industry.

However, different factors are responsible for fragile widespread and usage of M-Banking in the world, mostly infrastructures. As Wikipedia (2019), more than half of the populations of developed countries are M-Banking users. But on the contrary, developing countries especially in Africa, the users of M-Banking are less than half of the population. Many African countries implemented M-Banking system in their banks. According to Githeko et al (2013), the Kenyan Communication Act has provided an environment that has seen reforms in the telecommunications sector. *“This has enabled mobile telephony to grow exponentially hence providing a basis for successful M-Banking (M-banking) technology. Despite this, there are still long queues in the banking halls implying that most customers do not use M-Banking”*. This could be attributed to a high proportion of the banked population who either don't understand M-banking or have never heard about it (Porteous, 2007).

Advances in ICT in general, the growing use of the mobile phone for business transaction in particular have had a profound effect on the banking industry. While this is a global phenomenon, creating a truly global marketplace, penetration of Internet banking into less developed countries lags behind that of the developed countries (Abinet, 2010). These all factors have positive and negative impact for the introduction of M-Banking into banking industry system. M-Banking applications are increasingly becoming more important than bank branches. The study done by Haileyesus (2016) showed that people visit branches at less than half the rate that they use M-banking applications. The trend is only expected to accelerate, as banks continue to adopt new innovations and invest more heavily in technology. Not only do users demand functionality, but also companies increasingly demand better design & more intuitive interface (Clements, 2016).

2.2. Challenges of Mobile Banking System in Ethiopia

These challenges are M-Banking agents, technology, awareness, trust, risks, environment (organization), educational level, government directives etc. Additionally perceived risk is also the big problem. Perceived risk refers to the user's level of uncertainty (Lee, 2009) regarding the outcome of acceptance decision. The researcher identified five risks that can be described for M-banking, as follows;

1. **Performance risk:** refers to losses incurred by deficiencies or malfunctions of M-Banking servers.
2. **Security risk:** is defined as a potential loss due to fraud / a hacker compromising the security of MB user.
3. **Time/convenience risk:** this refers to a loss of time and any inconvenience incurred due to the delays of receiving payments or the difficulty of navigation.
4. **Social risk:** refers to the possibility that using M-Banking may result in disapproval by one's friends, family, work group, etc.
5. **Financial risk:** it is defined as the potential for monetary loss due to transaction errors or account misuse.

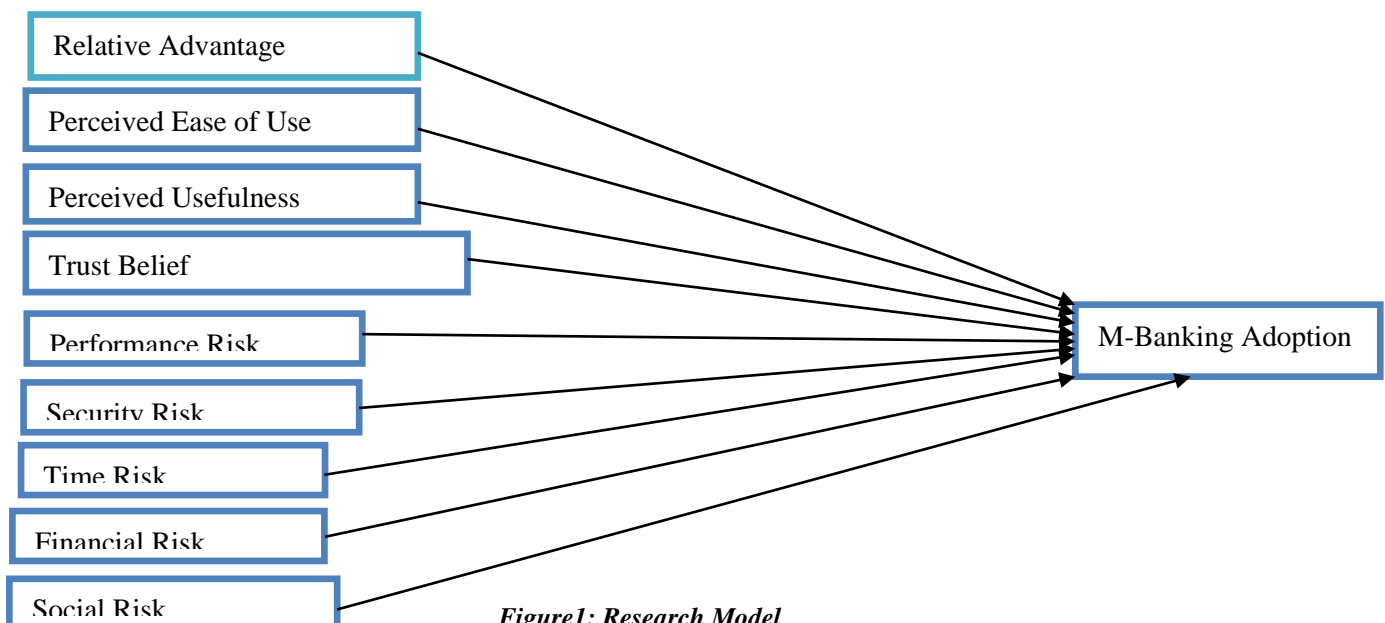


Figure1: Research Model

2.2.1. Hypotheses of Mobile Banking Adoption and Challenges

As shown on above figure, we could derive about nine hypotheses for the study four driving factors and the last five variables as challenges of M-banking adoption are; Relative advantage positively influences M-Banking adoption by customers, Perceived ease of use (PEOU) positively influences M-Banking adoption, Perceived usefulness (PU) positively influences adoption of M-Banking, Trust reliability influences adoption of M-Banking positively, Performance risk negatively influences the adoption of M-Banking, Security risk negatively influences the adoption of M-Banking, Time risk influences M-Banking adoption negatively, Social risk positively influences the adoption of M-Banking and Financial risk negatively influences the adoption of M-Banking.

Drawing from technology acceptance, innovation diffusion and others, the adoption and challenges of new M-Banking system was analyzed in this study and the result was showed. The decision of whether to carry out a quantitative or qualitative approach lies in the researcher's assumption (Kanaan, 2009), in order to achieve the objectives of this study, the research method followed was both quantitative and qualitative, mixed approach.

3. Major Findings and Discussions

3.1. Mobile Banking Adoption in Ethiopia

Descriptive analysis and Pearson correlation was used to analyze (determine) variables' relationship with adoption and challenges of M-Banking system. Various combinations of variables, which included perceived usefulness, perceived ease of use, perceived risk, trust reliability, and perceived cost, was tested to establish the best combination of predictors. The challenges of M-Banking adoption system in the country on both the bank and customers' side, questions were derived from analysis of different related literatures organized in our country context, which was distributed to the respondents were analyzed with their corresponding hypothesis as follow. They were prepared according to Likert scale responses. The hypotheses testing and analysis was conducted by Pearson Correlation coefficient and presented as follow.

		M-Banking Adoption	Relative Advantage
M-Banking Adoption	Pearson Correlation	1	.613**
Relative Advantage	Pearson Correlation	.613**	1
		M-Banking Adoption	Perceived Ease of Use
M-Banking Adoption	Pearson Correlation	1	.698**
Perceived Ease of Use	Pearson Correlation	.698**	1
		M-Banking Adoption	Perceived Usefulness

M-Banking Adoption	Pearson Correlation	1	.695**
Perceived Usefulness	Pearson Correlation	.695**	1
		M-Banking Adoption	Trust Reliability
M-Banking Adoption	Pearson Correlation	1	.499**
Trust Reliability	Pearson Correlation	.499**	1
** . Correlation is significant at the 0.01 level (2-tailed).-for all variables and Number of respondents are 175			

Table 1: Pearson Correlation of M-Banking (source: SPSS Result)

Relative Advantage: Hoppee *et al.* (2001) suggested that relative advantage has a positive influence on the adoption of Internet Banking and it is compatible with their values to be adopted by users, and also the concept is applicable to M-Banking system. Table above; Correlation between Relative advantage and M-Banking adoption As depicted on the table, there is relatively strong association between both variables (relative advantage and M-Banking adoption) having 0.613 and significance value of 0.000, which is less than 0.05. Hence, it justifies the existence of significant correlation between the two variables.

The correlation coefficient is evident as most M-Banking offers more advantage than conventional banking system as it allowed them to manage their financial transaction better. And also M-Banking made them more comfortable with the bank to carry out their banking activities. Therefore, M-Banking enabled the customers manage their finance and made them comfortable to interact with the bank than traditional banking system where many procedures were reduced. Therefore, this is in support of the hypothesis that relative advantage influences positively M-Banking adoption. This research finding shows that comfortability and enabling to manage their finance through M-Banking system positively influence MB adoption. This shows that relative advantage have a positively influence on consumers adoption and usage of M-Banking service. This work is in line with Beatty *et al.* (2001) indicated that relative advantage has a positive influence on the company e-banking adoption. Therefore, it is reasonable to assume that relative advantage positively influence user adoption of M-Banking system.

Perceived Ease of Use: From table 1 above, the Pearson correlation values shows there is strong correlation between the variables (M-Banking adoption and perceived ease of use) by considering correlation coefficient 0.698 and significance value of 0.000. Hence, the correlation value of 0.698 means that there is relatively strong positive association between the variables. This means M-Banking system program easiness and simplicity as well as easily remembrances of PIN, USSD and Login numbers are positively influencing M-Banking adoption. Easily navigation of MB menu, easily making payment, money transfer and viewing balance, MB platform application and menu provided for the service was also easily operable and the

processes to be followed for banking transaction are very easy to the users. This all factors are identified as they positively influence a MB adoption. As qualitative data indicated, this simplicity is caused primarily by alternative languages the customer can prefer during and after his/her M-Banking subscribing time. Until this research was conducted, the Cooperative Bank of Oromiya was providing the service in five languages (English, Amharic, Afan Oromo, Tigrigna and Somali). So customer can choose one when registered as a hello cash m-banking user and can change later up on his/her request.

Nowadays, most of customers have many passwords in their hand at once; like phone password, ATM password, personal computer password, M-Banking passwords (which in turn have PIN, USSD and Login number codes in it), etc. Remembering all these passwords at every phase of their operation is expected from every customer. So making such passwords to be easily understood, memorable and amendable (for the lost password) is one of the greatest tasks to the bank. This hypothesis shows that, when an innovation is easy to use consumers will adopt it confirming that perceived ease of use is important for their decision to adopt M-Banking service (Adesinesi, 2012). This implies one of the basic benefits related with the use of M-Banking system is the perceived ease of use. Our research finding is consistent with Giglio (2002) as cited in Adesinasi (2012) that suggested adopting online banking services reduce the workload over the banking staff and it is easy to have more satisfied customers. This statement is very compromising for M-Banking system.

Perceived Usefulness: According to this table, perceived usefulness has also a significant association or relationship with the M-Banking adoption at correlation 0.695 and significance value of 0.000. Hence, the correlation coefficient value is a strong evidence for the presence of moderately strong positive association between the two variables. This means perceived usefulness such as using M-Banking makes it easier to do customers' banking activities, using M-Banking improves their performance of banking activities, using M-Banking increase the quality and output of banking transaction, and customers found that M-Banking is useful for their banking activities. Similarly clients can simply perform their banking activities like checking their balance, transferring funds, money withdrawing and paying their bills through their mobile with just a limited effort. This research finding is in line with Ayana (2012) suggestion; one of the implications of E-banking is that it should reduce the need to visit bank branches to get services in our country. This is also applicable for M-Banking systems in which majority of the activities are accomplished outside of bank branches, without physical contact and agents, unless cash withdraw. The respondents' feedbacks on the questions were mainly on their actual utilization of the system. However, according to Masinge (2010) the perception of perceived usefulness was not only based on actual utilization, but also on the behavioral intention of the respondents.

Trust Reliability: Trust reliability is the belief of the system (M-Banking) customers has on their service providing bank and the M-Banking system. And also the hello cash M-Banking system name and platform is shared by four companies; CBO, LIB, Wegagen Bank, and Somali micro finance institution, so the assessed

customers' perception toward these concepts are presented as follow. Table 1 Correlation between Trust reliability and adoption of M-Banking. It is visible that, there is a significant correlation present between the two variables (M-Banking adoption and trust reliability) as justified by correlation 0.499 and significance value of 0.000. Thus, it shows there is a relatively strong positive association between the two variables. Hence, it's a strong indication that trust belief and reliability influences the M-Banking adoption positively. Since there are many other nongovernmental banks running in Ethiopia including CBO, having customer confidence and reliability on themselves and the product they provide for their consumers makes them profitable. Along with this profit maximization, customer handling (including having many customers) is the heart of their existence as an entity, unless the competitive pressure that comes from other banks puts their wellbeing into danger. This finding is in consistent with Ayana (2012), suggested that lack of trust on the use of technological facility provided by bank as a factor that can hinder adoption of technological innovation by Ethiopian banking industries. Along with trust, the interoperability of the banks those share the same platform of hello cash system, users have no fear for future inter banking system. This research work is in line with Andrew (2009), who suggested ensuring the trustworthiness of banks and agents is a pivotal in establishing the integrity of the M-Banking product.

3.2. Challenges (Perceived Risks) of Mobile Banking in Ethiopia

One of the basic barriers (challenges) companies face during adopting technological innovation is the perceived risks. Perceived risk is the potential of loss in the pursuit of a desired outcome from using electronic banking services (Yousafzai et al, 2003). According to Lee (2009), there are five types of perceived risks; performance, security, time, social and financial risks. The analyses of the challenges of M-Banking was done by descriptive statistics using the mean and mean of mean values in order to describe the determinants' influence on the M-Banking, now let we see them in detail as follows.

Performance Risk: Performance risk refers to losses incurred by deficiencies or malfunctions of M-Banking servers (Lee, 2009), and the statistical result was discussed in the below section.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	Std. Deviation
Malfunction (deficiency) of bank server occurs during MB	31	37	65	26	16	175	2.29	1.17

Table 2: Performance Risk of M-Banking (source: SPSS Result)

Result reported in the above table indicates the mean value 2.29, for malfunctioning or deficiency of bank server that occurs during M-Banking and the majority of the respondents agreed with the occurrence of the problem. However, this hypothesis was not supported by qualitative data (interview) collected that the bank

officers strongly disagree with the issue. According to interviewees, “the bank have extra server that automatically substitutes the running M-Banking server” and said the company did not agrees with this.

According to quantitative and qualitative data, the conflicting feedback in between the customers and bank arises due to many reasons; one was the environmental factor like the infrastructure problems of electricity and telecommunication that strongly influence their response. Customer’s justification of whether the failure in bank server and mobile telecommunication should be clearly grounded. Interruption of electric system around the users (especially rural) during M-Banking transaction also might be a cause for such misconception. Secondly, customer’s technological skills like mobile usage know-how have also an impact on their response. In both factors affecting M-Banking, customers or respondents have no / minimum justification whether the bank server or other factors interrupted their banking activities. By and large, the server deficiency or malfunction during M-Banking negatively influence M-Banking usage critically (sometimes loss of finance) on the adoption of M-Banking. This finding is consistent with Lee (2009) who suggested sudden breakdown of web servers may lead to unexpected losses while online transactions.

Security Risk	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Mean of Mean	Std. Deviation
M-Banking is safe or secure	48	66	41	11	9	2.24	2.41	1.08
I prefer MB to do my banking activities for security reason	32	32	49	46	16	2.00		1.24
If I lose my phone, my banking service will be interrupted	14	43	44	44	30	3.00		1.22
Time Risk								
Using MB enables me to accomplish my banking activities more quickly	56	82	30	5	2	1.94	2.0	.84
Due to poor network signal of mobile network it takes lots of time to do transactions	64	61	28	22	-	2.05		1.02
Social Risk								
M-Banking suits my life style and technology	62	79	21	11	2	1.93	2.07	.91
Using MB to do my banking business fits to my work style	43	77	41	14	-	2.15		.89
Using M-Banking makes my life style more convenient	45	79	37	10	4	2.14		.94
Financial Risk								
I afraid MB that leads me to erroneous losses	9	27	52	45	22	2.88	2.4	1.03
The cost (service charge) incurred for MB is considerable	18	95	30	18	14	2.01		1.07

Table 3: Perceived Risks of M-Banking (source: SPSS Result)

Security Risk: M-banking safety, especially security of ownership of M-Banking usage in Ethiopia has an impact whether the system is compatible with privacy need of the customer. The above table shows the mean 2.24 for M-Banking safety/security, which means majority of the respondents, has agreed up on the privacy protection of the M-Banking. Customer privacy in M-Banking is the secured customer of cyber crimes like hackers, crackers, phishing, etc that could harm the customer and finances. It is also the protection of customer's passwords, financial transactions, etc of the users. The table above also indicates statistical result mean 2 (agreed) for whether the customers prefer MB to do banking activities for security reason, and 3 (neutral) for questions of interruption of their banking activities if they once lose their mobile phone. On the second statement, the respondent needs some additional clarification to further justify either agree or disagree as they are in the middle. The mean of mean for the respondents' responses of statements on security risk is equal to 2.41 which are indicating that the respondents on average have agreed to some level on the security of M-Banking system. The loss of one feature of them leads to security risk, which in turn led to negatively influence on MB. This finding is in line with Ayana (2012), suggested that one of the barriers in the adoption of e-banking is fear of security risks.

Time Risk: One feature of M-Banking is proper usage of banking time in a reasonable way. Customers want to reduce extra time wasted due to unwanted delay of delivery of fund transfer and paying utility bills, and getting of the associated agents to withdraw money. According to their response in the table 4.9, the mean is 1.94 for M-Banking enabling customers accomplish their banking activity more quickly. This shows, majority of the respondents were agreed on M-Banking helped them to accomplish their banking activity within short period of time than conventional banking. The table also indicates the mean of 2.05 for poor network signal's impact on M-Banking as it consumes lots of time to perform transaction.

The result of the analysis in above table has also indicated that the mean of mean of the statements regarding the attitude of the time risk of users is 2.0. From this we can infer that missing one feature of these (that leads to time risks) have generally a negative influence toward the M-Banking system. According to data collected through interview this factor affecting M-Banking adoption arises from insufficient infrastructures (electricity and telecommunication) in the country. This fragile or infrequent appearance of telecommunication leads customers to unsuccessful transaction, delay (time consuming) in m-banking activity, loss of finance and as well as loss of trust and reliability on technology generally and M-Banking specifically. The main objective of M-Banking is financial inclusion that is aimed to arrive at non-banked population of the country especially the rural population. As a result, lack of such infrastructure in the majority of unbanked area of population, is a great barrier to meet their objective specifically and adoption of all aspects of technology generally. This research finding is consistent with the work of Lee (2009), who suggested hurried consumers were more

likely to purchase over the Internet to save time and consumers are very time oriented and concerned about potential risks of wasting time spent implementing, learning how to use and troubleshooting of a new system.

Social Risk: M-Banking is making a users' life style more suitable, compatible with all work categories and convenient. So in order to assess respondents' reaction toward all these aspects, questions like M-Banking suitability, its matching with their job and convenience which indicates the social standing of the customer, were directed to them. Consequently, the above table shows mean of 1.93, 2.15 and 2.14 for suitability of MB in life style, work style and more convenient to customers respectively. This indicates customers were agreed with all these factors as it enabled them to cope up with some technology aspects (because all results very close to 2 or agreed). Mean of mean of these statements on social risk of MB to the customers has indicated that it is two (2.07). This shows that the mean of the responses on all the statements can be taken as the customers have agreed on using M-Banking system has no social risk and it is compatible to their work styles. On the contrary, the failure occurs during M-Banking activities like delay in delivery of finance to the receiver, unavailability of agents, lack of branch follow up, etc that have a negative impact on compatibility of the system to social circle of the customer creating distrust among them. This research output is in line with Adesinasi (2012), the impact of social influence on the users who were either influenced by friends, relatives or parents as well as by people they know, and Lee (2009) concern about the opinion of referents (friends, family, co-workers) with regard to one's actions has been referred to as subjective norm that influence his/her attitude toward technology acceptance (like e-commerce).

Financial Risk: Regarding to this table, descriptive statistics result for mean of customers' afraid of erroneous losses due to MB was 2.88, which mean majority of them remains neutral. The neutral respondents' feedback shows fear of M-Banking that could lead them to loss is unjustifiable within available condition or information. The table also shows mean result 2.01 for question the cost or service charge that is incurred for M-Banking as considerable. This means respondents agree as it is proportional to services they get from M-Banking system. Mean of mean for both statements on MB financial risk to the customers has also indicated that it is above two (2.4). This shows that the mean of the responses on all the statements can be taken as the customers have agreed on using MB than using teller based banking may led them to loss. As few officers and customers said, "*the bank has made service charge (cost) adjustment for users up on the feedback from the customers*". This hypothesis implies to two dimensional major factors which influences customers' adoption of new technology. Firstly, financial risk as defined by Lee (2009) is "the potential for monetary loss due to transaction errors or bank account misuse". The other aspect of the hypothesis goes to a study conducted by Wu and Wang (2005) on mobile commerce acceptance that showed perceived cost or transaction cost had a significant effect on the adoption of M-Banking. So it is hypothesized that the transaction cost of M-Banking services is more likely to negatively influence the adoption of M-Banking.

4. Conclusion and Recommendations

Generally, drivers of M-Banking adoption in Ethiopia are relative advantage, perceived ease of use, perceived usefulness and trust reliability. The challenges of the emerging technology of mobile banking adoptions are performance risks of server, security risks, financial risks (loss), time risks and social risks. Each and every of these variables are analyzed and discussed in comparison with other countries contexts and researches.

To overcome the existing challenges of M-Banking adoption, the researcher recommends the following points;

1. The distribution and performance of infrastructures like ICT, telecommunications and electricity that are priorities to M-Banking adoption especially around the rural area.
2. Government supports like providing clear and comprehensive laws on criteria of registration and operations of the system should be available.

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