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Mildred W. Kiogothe
School of Management and Commerce (SMC)
Strathmore University

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**Factors Influencing Adoption of Mobile Banking in Kenya:
A Case of Commercial Banks' Customers in Nairobi County**

Kiogothe Wangari Mildred



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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Mobile banking which is also known as M-banking is an innovation perpetuated by the widespread of mobile communication technology (Cracknell, 2012). Mobile banking offers a support system that allows customers to interact and access banking services from their comfort zone; through the connection between a mobile phone device, an individual and business bank account (Cracknell, 2012; Doline & Solomon, 2014; Porteous, 2006). Classified under electronic banking, the term mobile banking lies where internet banking also falls. To use internet banking one would need a computer that is connected to the internet whereas using mobile banking requires a wireless device (Yu, 2012).

In the developing economies, there are more mobile phone users than bank account owners making it the most effective way of reaching out to the unbanked population (Nandhi, 2012; Tobbin, 2012). The mobile phone technology is cited as a rampant and useful tool especially in mobile banking innovations (Cruz, Neto, et al., 2010; Sangoro, 2013). These innovations in mobile banking have resulted in offering services in grouped into three major categories: Investments' support, investments' support and content services (Cruz, Neto, et al., 2010; Doline & Solomon, 2014).

Mobile banking is perceived to be inherent anywhere, anytime and convenient in providing a unique solution to problems associated with financial access by users in emerging/developing economies (Tobbin, 2012). This is possible because mobile banking can reach a wider geographical location due to its unlimited nature (Tobbin, 2012). This even ensures that the unbanked can get banked since they can easily get a mobile phone and adopt the technology making its use extended to the remotest parts (Porteous, 2006; Tobbin, 2012). Both Korea and Japan are high-income countries with an extended penetration of both mobile phone and internet. These countries demonstrate that mobile banking and mobile payments can thrive even where there are already other established channels for payment. However, the levels of banked

population in both countries are very high; There is no evidence that the mobile banking offerings need to be nor or are transformational, (Porteous, 2006).

Haonga (2015) observed that challenges facing customers in the usage of mobile banking services include system inaccessibility, delay to complete the transaction on time and wrong mobile numbers. Haonga (2015) recommends that Telecom companies and banks should work together to resolve network problems if adoption of mobile banking is to achieve any meaningful milestones and this can only be achieved with the presence of interoperability. This means that Customers access to mobile banking services will be more effective hence attract more customers to adopt mobile banking (Haonga, 2015). However, to achieve this, banks need to ensure that their customers are well trained and conversant with the use of mobile banking (Haonga, 2015). Toroitich & Jelaga (2016) suggest that PEOU, PU, and PR have a significant effect on adoption of mobile banking in Kenya.

Social influence expressed as the pressure exerted on an individual by the opinions of others (de Silva, Ratnadiwakara, & Zainudeen, 2011). Kasyoki (2012) and Ravichandran (2015) observe that social norms have insignificant relationship towards the intention to adopt the mobile banking in Kenya. There seem to be a contradiction since Lasserre (2015) Hiti, Ayesha and Madana (2016) establish that social norms have much significance in the adoption of mobile banking technology.

A blend of legal and regulatory openness is required for any new market to have enablement. The combination of regulatory and legal openness creates an opportunity for starting up and to experiment. If the Regulatory and legal climate is sufficiently certain, it would be expected that there will be no negative or arbitrary changes to the regulatory framework, giving mobile services providers and banks the confidence to invest their resources that are necessary for mobile banking adoption (Cracknell, 2012; Tobbin, 2012). According to Porteous (2006) countries with low levels of effective regulation may be very open but highly uncertain, since administrative discretion may lead to arbitrary action. Consequently, countries with greater certainty may be more closed up, in that the types of entity and approach allowed to start up are restricted (Cruz, Neto, et al., 2010; Tobbin, 2012). Particularly in a new market sector such as mobile banking, where business models are unstable, enablement in the regulatory and

policy sector means a move towards greater openness and greater certainty (Porteous, 2006).

There have been changes in the regulatory framework by the communications authority of Kenya and CBK that favor adoption of mobile banking. These changes allow interoperability which necessitates this research to gauge the effects of these changes on adoption of mobile banking compared to the past research findings (de Silva et al., 2011; Haonga, 2015; Kasyoki, 2012; Lasserre, 2015; Ravichandran et al., 2016). To establish whether Ravichandran et al. (2016) or Kasyoki (2012) were right was the subject of this research. The research also sought out to establish whether the differences were as a result of the use of different methodologies or geographical location such that it may account for contradictory findings on the Perceived Relative advantage, social Influence and Regulatory Factors on mobile banking adoption.

1.1.1 Adoption of Mobile Banking

Adoption of Mobile banking services in Kenya is still very low in comparison with mobile operator-led transfer services using mobile phones (Lule, Mwololo, & Timothy, 2012). The banking sector is questioned by past researchers whether it has well understood the un-banked user (Lule et al., 2012). There is an observation that consumers are wary of new technology and literature is well supplied with papers which investigated the initial resistance exhibited by users towards technological advancement and development (Donner & Tellez, 2008). Even though there has been a rapid rollout of mobile services over the past decade, mobile transactions, including mobile payments and banking, have not been used as much as expected (Cruz, Barretto, et al., 2010).

A recent study in Kenya found out that technology, social, cultural and economic factors influence mobile banking adoption at KCB Bank (Sachombe, 2017). The study recommends that similar studies be carried out in other banks to compare the findings and make generalized conclusions. Most of m-banking and m-payment services providers in Africa reported that most barriers to their growth related to; uncertainties over customer adoption, which is common in an early phase of market development and secondly specific regulatory issues such as remote customer due to diligence requirements and access to the payments system (Porteous, 2006).

There is a perception that mobile banking can spread fast amongst people. From observation in Europe and the United States, markets witness the limited use of mobile payments going contrary to the expectations (Porteous, 2006). Among bigger risks towards the development of mobile banking is for example attributed to the fragmentation of European market creating unviable proprietary platforms (Porteous, 2006). Porteous (2006) believes that diffusion of mobile banking service requires proper regulations to even allow for large-scale international remittances. Mobile payments are far more spread out in Asia than in the US and Europe, reaching early 'break out' stage in Korea and Japan (Porteous, 2006). It is suggested that for mobile banking to take off there must be a large player who controls it and (Cruz, Neto, et al., 2010; Porteous, 2006). This study embarked on finding out whether for mobile banking adoption to take off there must be a large player who controls it.

1.1.2 Commercial Banks in Kenya

In Kenya, there are a total 42 commercial banks with two banks in receivership: Imperial Bank and Chase Bank. The Central Bank of Kenya regulates the 42 banks. The Capital Markets Authority (CMA) having additional oversight over 42 banks. All banks are to adhere to the set prudential regulations as a requirement such as cash reserve ratios and minimum liquidity ratios with the Central Bank (CBK, 2016). The banking sector in Kenya experienced growth in 2016 which has mainly been orchestrated by Banks responding to the needs of the Kenyan market for efficiency and convenience through alternative banking channels such as the internet, mobile, and agency banking (Cyttonn Q1 'Banking Sector Report, 2016).

One of the biggest challenges that banks in Kenya face is stiff competition from the most unexpected quarters: the telecommunication industry, mainly Safaricom, which in 2007 launched M-Pesa, and already had more than 10-million users within a rather short period. The banks started innovating their MB solutions and started to form partnerships with these telecommunication service providers which include Safaricom, Airtel and Orange money (Alliance for Financial Inclusion, 2010).

There has been accelerated growth in the adoption of mobile banking by the commercial banks in Kenya in recent years, evidenced by the numerous publications in the media on the various mobile banking services offered by these banks. For instance, the major publications by banks seen in the media include: Barclays Bank of Kenya's Hello

Money, Kenya Commercial Bank's Mobi-bank and M-Pesa account, Co-operative Bank of Kenya's MCo-op Cash, Equity Bank's M-Kesho, Eazzy 247 and Equitel, National Bank's SIM-ple banking, Family Bank's Pesa Pap, Commercial Bank of Africa's M-Shwari amongst others. The services offered in partnership with the telecom companies, and most of them are in partnership with Safaricom's M-Pesa, thus allowing customers to transfer funds from their bank accounts to M-Pesa. Equity Bank, a bank focused on small and medium enterprises obtained a Mobile Virtual Network Operator (MVNO) license through its subsidiary Finserve Africa (Equitel) and recently launched a mobile banking and money transfer service, becoming a new source of competition given Equity's importance in the financial sector.

There have been recent changes in the regulatory framework by the communications authority of Kenya and CBK, which favors adoption of mobile banking. CBK has adopted a functional approach to regulation where Mobile Network Operators and Banks have been permitted to provide mobile money services. Customer funds are held in trust with a bank that is strongly rated prudentially, and no investment or lending of such funds is permitted. The funds are to be isolated from the service provider's funds and safe from claims of its creditors. Service providers can appoint agents responsible for the agent's actions. CBK's oversight, inspection, and enforcement duties are formally recognized. Outstanding features of the new regulatory framework are safeguarding and Ring-fencing of funds, Non-exclusive dealings with agents, Risk management, and Interoperability (Legislative Supplement No. 43, 2014).

Banks have also gone ahead and introduced PesaLink offered through SimTool Kit. This service enables interbank transfers from one person to another within banks that have registered on the platform. Money is sent using a mobile from and into a bank account. Customers can register for the services to enable them to use their mobile numbers to send and receive money into their accounts from other banks. Recipients who have not registered their phone numbers can also share their bank account to receive from other participating banks. All of the banks mentioned have mobile banking apps downloadable on smartphones.

1.2 Problem Statement

The reasons behind the low usage of mobile banking and the obstacles that customers face when using the service are not clear despite the simplicity and popularity of using

the cell phone (Sachombe, 2017). Mobile banking should, in essence, increase users access to appropriate formal financial services (Porteous, 2006; Tobbin, 2012). On the contrary, users are adamant to adopt this technology which is deemed more convenient, possibly even cheaper than carrying out banking transactions (Tobbin, 2012). Unlike mobile money transfer services operated by mobile network operators, mobile banking promises a lot more to the users, including credit history, access to loans and interest on funds saved. Furthermore, customers perceive mobile banking to have a relative advantage when compared to traditional banking possibly influencing them to adopt mobile banking services. This is contrary to what is happening where the majority of banks customers are reluctant in adopting the mobile banking technology in transacting (Cruz, Neto, et al., 2010; Porteous, 2006; Tobbin, 2012). This raises questions as to why adoption of mobile banking services is much lower than is anticipated (Cruz, Neto, et al., 2010; Doline & Solomon, 2014; Donner & Tellez, 2008).

Various studies showed that there could be discernible challenges that limit adoption and use of mobile banking (Doline & Solomon, 2014; Rupa, 2015). Consumers' adoption of mobile banking services is considered to be influenced significantly by social influence, perceived usefulness, perceived ease of use, perceived risk, and regulation. The most significant positive impact is of social influence on consumers to adopt mobile banking services (de Silva et al., 2011; Kazi & Mannan, 2007). This, however, contradicted the findings of Kasyoki (2012) and Ravichandran et al., (2016) who argued that social norms had an insignificant effect on adoption of mobile banking and that perceived relative advantage had the most significant Influence on Mobile Banking Adoption.

A number of studies have been conducted in the area of mobile banking and mobile banking adoption from different dimensions. Haonga (2015) examined the effectiveness of mobile banking on customers satisfaction while Mutua (2010) focused on the effects of mobile banking on financial performance. On the other hand, Kasyoki (2012) investigated factors affecting mobile banking adoption in Kenya. The context of mobile banking in these studies was solely based on the M-Pesa platform. Whereas several studies have investigated factors affecting mobile banking adoption in Kenya (Haonga, 2015; Kasyoki, 2012; Mutua, 2010; Toroitich & Jelaga, 2016). These studies mainly concentrated on mobile banking which depended on the M-Pesa platform, applied variables from one or more of the best-known Technology Adoption Models

and used a single bank approach focusing on other counties apart from Nairobi. Furthermore, these studies were done under a different regulatory environment that did not allow interoperability of mobile banking services amongst banks.

There was, therefore, a need for research to focus on a the riskier mobile commerce service (Joubert & Belle, 2013). This study focused on factors influencing mobile banking adoption in Nairobi County, investigated the concept of mobile banking using an Integrated Model Framework and applied a multifaceted approach that combined all the platforms other than M-Pesa while taking into consideration the recent regulatory changes in mobile banking that allowed interconnectivity and interoperability.

1.3 Research Objectives

The main research objective was to examine factors influencing adoption of mobile banking services among commercial banks' customers in Kenya.

1.4 Research Questions

1. What is the extent to which perceived relative advantage influences mobile banking adoption among commercial banks' customers?
2. What is the extent of social influence on mobile banking adoption among commercial banks' customers?
3. What is the extent to which regulation influences adoption of mobile banking by commercial banks' customers?

1.3.1 Specific Objectives

1. To determine the extent to which perceived relative advantage influences mobile banking adoption among commercial banks' customers.
2. To examine the extent of social influence on mobile banking adoption among commercial banks' customers.
3. To establish the extent to which regulation influences adoption of mobile banking by commercial banks' customers.

1.5 Scope of the Study

Mobile banking is a subject to different boundaries and interpretations. Hence, it is important to define the scope of this study In the ample sense, mobile banking is considered as a traditional banking service accomplished by portable devices. The study focused on commercial banks' customers in Nairobi County. Since Nairobi County is where Banks have their head offices, the clients within Nairobi were expected to give the required data for analysis. This analysis looked at the commercial banks because they also form a major part of the wider financial sector in Kenya.

1.6 Significance of the Study

The Kenya Bankers Association (KBA) may benefit from this study in that based on the results of this research, KBA may formulate policies and regulations that support customer adoption of mobile banking by for example requiring its members to actively and diligently market their mobile banking websites to ensure that more Kenyans adopt the innovation. It might also make use of this study to improve its recently launched Pesalink services, which is also a mobile banking platform. Mobile Network Operators will benefit from this study since it will help Identify areas of synergies between them and Commercial banks in Mobile Banking and the technology industry as well.



2.1 Introduction

The Literature Review section reviews concepts on mobile banking, adoption and its usage. It presented empirical studies done on adoption of mobile banking services amongst commercial banks' customers. A conceptual framework was formed and variables operationalized. A research gap section sought to summarize the area that needs research.

2.2 Theoretical Review

The theoretical review aims to identify theories that could be used to predicate this research. The theories of adoption and usage of technology are explained under

Diffusion of Innovation Theory (DIT), Theory of Reasoned Action (TRA) and the Theory of Technological acceptance model (TAM).

2.2.1 Diffusion of Innovation Theory (DIT)

According to Rogers (1983), innovation could be an idea, process or product provided it's new in the marketplace. Roger's diffusion of innovation theory was selected because it provides a familiar framework to determine obstacles that can impede the diffusion of MB. Applying Roger's theory advances understanding of the Mobile banking adoption rate based upon attributes of the innovation. Mobile banking is an innovative technology, its characteristics that include five attributes are presumed to affect its adoption and acceptance amongst customers. The five attributes that consistently prove to determine the diffusion of innovation rate are: compatibility, complexity, relative advantage, observability, and trialability (Everett, 1995; Rogers, 2003). These characteristics help decide whether or not to adopt it.

Individuals in a social system tend to adopt innovations in a time sequence. The time sequence is classified into adopter categories depending on how long it takes them to start using new ideas. It's very useful for a change agents to identify which categories certain individuals belong to since their short-term goals are to facilitate the adoption of an innovation (Rogers & Everett, 1983). The human interaction causes adoption of a new idea through interpersonal networks. If the first adopter of the innovation discusses it with two individuals of a given social system, and the two become adopters who then pass the innovation along to two of their peers, and so on. The resulting distribution follows a binomial expansion and the distributions over time are expected to follow a bell-shaped curve (Everett, 1995).

The innovation-decision process characterized by five stages in which the individual moves from understanding the innovation, creating an opinion about it, then accepting it or rejecting it, implementing the change if it is allowed, and finally confirming his or her perspective. The categories range from laggards, the late majority, the early majority, the early adopters and innovators being the first ones to take up the innovation. (Everett, 1995). Innovativeness, on the other hand, is the degree to which an individual is relatively earlier in the adoption of new ideas when compared to other members of his or her social system (Rogers, 2003). Mobile banking being an innovation in the banking services and Information Technology industry makes it

necessary to incorporate Rogers's model that was used to discuss the influence of regulation and social systems in the adoption of mobile banking services discussed in depth later in this chapter. This theory has a weakness since it may ignore cultural norms, social norms and standards of acceptance into society greatly outweigh the idea of taking on an innovation (Rogers & Everett, 1983).

2.2.2 Theory of Reasoned Action (TRA)

Reasoned Action is notably concerned with behavior because most researchers took it as given that social attitudes guide human behavior (Ajzen & Fishbein, 2001). TRA recognizes that some factors or situations cap the influence of attitude on behavior. Reasoned action predicts behavioral intent is dependent upon attitudes and subjective norms that a person has (Ajzen & Fishbein, 2001). The attitude that an individual has according to Ajzen (2002) has two component which is the evaluation and strength of belief (Ajzen, 2002). An interesting thing with attitude is that it can be negative or positive depending on one's perception of the outcome experienced so far.

The theory was useful in explaining how these factors may affect or influence the adoption of technology as it may predict behavioral intention. It does this by measuring actual behavior and the intentions of an individual against willpower (Ajzen, 2002). However, the theory may not apply in instances where behavior is a result of factors that do not originate from the will to mention knowledge or assistance in some cases, making TRA inadequate in examining such types of actions. On the matter of frequency with which behavior was performed in the past, it is observed that it can explain variation in following behaviors independent of intentions (Ajzen, 2002). This theory is important in this study as it has been widely used to explain human behavior (Liao, Lin, & Liu, 2010). Mobile banking adoption is similarly a social psychology behavior, and the constructs presented in the model have been studied in other models.

2.2.3 Theory of Technological Acceptance Model (TAM)

The theory was developed by Davis (1989) to explain factors that influence an individual's decision to adopt the technology, and in this case is the adoption mobile banking. Technological acceptance model, layout how users come to adopt a technology. The model explains that when new technology is presented to users, the decision on how to use it is influenced by several factors. The model has captured the attention of many in explaining information systems adoption even though many

models have been proposed in explaining and predicting use of information system. An understanding of the model is essential in explaining user acceptance of the technology. However, researchers share mixed opinions regarding its practical effectiveness theoretical assumptions. This is because TAM is insufficient regarding its rigor and relevance in making it an established theory of information system (Rogers & Everett, 1983).

A review of the past literature concludes that the use of the TAM model by different researchers showed that the basic model of TAM had been used for various research especially towards the adoption and the use of information technology. While other scholars have extended the model to suit the direction of their study with variables such as motivation, price, convenient, trust, perceived risk, financial risk, performance risk, privacy risk, and security had been included. In this chapter it is also evident that the two variables of the TAM model play a central role in customers' attitude and perception, towards the use of new technology, that is perceived risk, usefulness and ease of use. Davis (1989) and Bagozzi (2007) contextualize TAM as focusing on the attitude like explanations of intention to use a particular service or technology consisting of six concepts. 1) external variables, 2) intention to use 3) attitudes toward use 4) perceived ease of use 5) perceived usefulness, and 6) actual use. This research used the TAM model to investigate Relative advantage, and regulatory factors which were as classified as external variables discussed later in this chapter.

2.3 Empirical Review

This section evaluated existing literature on the factors influencing adoption of mobile banking namely perceived relative advantage, social influence, and regulation.

2.3.1 Adoption of Mobile Banking

Mobile Banking activities include the provision of financial and banking services with the help of wireless telecommunication equipment (Lasserre, 2015). The span of services offered includes but not limited to facilities to conduct stock market and bank transactions, accounts administration, balance checks, payments, the access to customized information and credit applications. In addition, the Mobile banking system is also referred to as SMS Banking as a technology that enables services offered by banks to its customers by permitting them to operate over their mobile phones using SMS messaging (Davis, 2010).

The overall pace and of adoption of m-finance services is relatively low and confined to more affluent users in developing countries (Duncombe & Boateng, 2017). In 2013, there were almost as many mobile-cellular subscriptions as people in the world, with more than half in the Asia-Pacific region (3.5 billion out of 6.8 billion total subscriptions) (Sanou, 2014). As global mobile-cellular penetration approaches 100% and almost attaining market saturation, growth rates have fallen to their lowest levels in both developed and developing countries. Mobile-cellular penetration rates stand at 96% globally; 128% in developed countries; and 89% in developing countries (Sanou, 2014). Adoption of mobile phone banking demonstrates that the level of adoption is not satisfactory since it can reach to many more people (Duncombe & Boateng, 2017).

Kenya has the leading mobile money system in the world (Kenya National Bureau of Statistics, 2015). However, the figures of Adoption of mobile banking are lower compared to those of mobile money with Mobile Bank Accounts at 17.5 % and mobile banking loans penetration at 5.9 percent (Kenya National Bureau of Statistics, 2016). This study was set to find out why there was a difference in the figures.

Cellular banking, or m-banking, is one of the most promising tools for accomplishing a price-powerful pathway to digital monetary inclusion at scale. Mobile phone use has grown globally, at an impetuous pace as people around the world from the bottom to the top of the pyramid have the view that they are efficient and affordable tools for security, communication, entertainment (Jesse et al., 2013).

The pervasive use of mobile phones makes them cost-efficient, scalable and effective service delivery platform. This potential has been harnessed and recognized through a variety of mobile banking tools. The potential has allowed previously unreachable clients to be sent SMS payment reminders or to make digital payments via their phone.

2.3.2 Factors Influencing Adoption of Mobile Banking in Kenya

According to Doline and Solomon (2014), Several factors are presumed to affect adoption of mobile banking as shown. The recently witnessed market growth of 3G smartphones has tremendously made the wireless delivery channel into becoming a necessary option for firms to create profitable commercial opportunities that would ensure continued growth in its revenue generation capacity. Potential inverse determinants of technology adoption include frequency of use and age (Robinson & Moore, 2010).

Age, income levels, personal innovativeness, perceived relative advantage, social influence and education have been studied predominantly and have a significant impact on customers' attitudes towards technological adoptions in the financial services (Lasserre, 2015; Mwege, 2014; Robinson & Moore, 2010; Rupa, 2015). Amongst the above factors, perceived relative advantage, social influence and regulation stand out having been used by most researchers.

2.3.2.1 Perceived Relative Advantage and Mobile Banking

Low perception of relative advantages compared to a personal contact in the branch makes it difficult for people to adopt mobile banking (Cruz, Barretto, et al., 2010). Doline and Solomon (2014) identified PRA of mobile banking compared to conventional banking to include but not limited to reduced cost, convenience, wider customer reach, labor free, higher-security level, accessibility, and availability. These advantages seem to agree with Malhorta (2011) who says that a significant advantage of mobile banking is its accessibility to a large segment of the world population which would have wireless connectivity but no Internet access. (Alalwan, Dwivedi, Rana, & Williams, 2016; Cruz, Neto, et al., 2010; Malhorta, 2011).

One of the crucial factors determining the success of m-banking service providers is Customer perceived m-banking service quality. The providers face constant pressure and ever-increasing competition to keep up with rapidly advancing mobile technologies (Jun & Palacios, 2016). If a mobile banker does not to precisely identify the needs of m-banking customers and monitor their changing preferences, efforts to provide satisfaction would be ineffective (Jun & Palacios, 2016). Thus, identification, analyzing and measurement of clients' expectations of the m-banking services provide a reference frame for banks' assessment of their m-banking service quality (Jun & Palacios, 2016).

A study on Equity bank in Kenya observed that relative advantage plays a significant role in determining consumers' decision in mobile banking adoption. Relative advantage in regards to mobility causes intention to use mobile banking and triggers the adoption of mobile banking (Doline & Solomon, 2014). This study tried to classify the relative advantage under the headings perceived usefulness, perceived ease of use, and perceived risk, creating arguments whether they have an influence on mobile banking adoption amongst Kenya commercial banks customers. Classification of relative advantages as perceived usefulness, perceived ease of use, and perceived risk

was done in Jordan on a study Consumer adoption of mobile banking in Jordan (Alalwan et al., 2016). The evolutionary process of changing customer perceived m-banking service quality might require new research to be done in the area due to changing demands over time (Jun & Palacios, 2016).

Perceived ease of use is the degree to which a person believes that using a certain system would be free of effort (Prema, 2009). Simply put, ease of use is the extent to which the user will not apply effort (Chuttur, 2014). In another study done by Abdul Hamid (2007) on internet banking in Taiwan, he found out that consumers emphasize on usefulness more than ease of use. This, however, varies as the study argued that low involvement consumers of technological banking products value ease of use such as less mental effort (Abdul Hamid, 2007). Individuals appreciate the importance of mobile banking services in the transactions they make owing to its convenience as it is found to be a significant factor influencing technology adoption (Nasri, 2011). Customers value mobility feature in mobile banking since it helps them save time by avoiding unnecessary movements (Yu, 2012). The belief that mobile banking is convenient for example drives users to adopt the technology. This agrees with Zhang and Gutierrez (2007) as they find that user adoption of information technology is affected by the intentions and capacity within themselves to carry out those intentions. In this research context, those who perceived mobile banking to be easy to adopt and use had a positive attitude towards it. The same case also applied to those who perceived it to be useful as it followed that they had a positive attitude towards mobile banking technology adoption. According to Park (2009) users attitude on technology affects whether or not they adopt the product or service transacted via the technological platform. In this case, it was expected that users who perceived mobile banking as useful would use the mobile banking services and make repeated use in the future, as they would adopt it fully.

Lee, Lee, and Kim (2007) conducted a study on perceived risk in the context of mobile banking adoption, which was also utilized in this study. The risk divided into five facets; financial risk, performance risk, social risk, time risk and security risk. Performance risk referred to losses incurred by malfunctions or deficiencies of mobile banking servers (Lee, 2009). Privacy/Security risk defined as a potential loss due to a hacker or fraud compromising the security of an m-banking user. In a similar study, Luarn and Lin (2005) used the construct perceived credibility, defined as the point to

which an individual believes that using mobile banking would have no privacy or security threats. For this study, security or privacy risk considered similar to a lack of credibility. Convenience or Time risk referred to any inconvenience incurred or loss of time due to delayed payments or difficult navigation (Lee et al., 2007). Social risk referred to as the possibility that using mobile banking may result in disapproval by one's friends, workgroup or family (Lee, 2009). Financial risk defined as the potential loss of money due to bank account misuse or transaction errors (Lee, 2009).

Lee (2009) and Kim (2007) found that all the five risks mentioned above emerged as negative factors in the intention to adopt online banking. However, the effect of social risk is found to be insignificant with the intention to adopt online banking (Lee, 2009) and therefore does not directly affect usage and adoption of mobile banking. Im et al. (2008) suggest that managers need to emphasize ease of use when deploying technology perceived by users to be high risk. Managers need to focus on communicating the usefulness of the technology when implementing a technology perceived to be low risk (Lasserre, 2015).

One of the factors that an individual considers before opting for any technology is security. Banking is one of the critical parts of anybody's life, and potential loss of funds or assets could hamper their experience with the Bank. Mobile technology is potentially more powerless against interception as it's propagated through remote mode (Malhorta, 2011). Potential users Innovation resistance was cited as an obstacle towards usage of the technology such as mobile banking (Laukkanen, 2008). A study done In South Africa that showed that amongst South Africa early adopters, the benefits of mobile commerce such as image and compatibility were more important than perceived risk and trust (Joubert & Belle, 2013). However, the study was specific to mention that a significant contributing factor to the intention to participate in mobile commerce was system based trust. This study related to Joubert and Belle (2013) and tried to see whether it was the same case to mobile banking, and find whether personal disposition to trust and risk are indeed important antecedents to trust and perceived risk.

According to the research carried out, adoption of banking technologies did not appear to be driven by the perceived risk (Joubert & Belle, 2013). However, there seems to be a contradiction since another study by Jahangir and Begum (2008) revealed that perceived ease of use, usefulness, privacy, security and customer attitude are positively and significantly related to customer adoption. In another study by Opili and Willy

(2016) risk was found to influence mobile banking usage. Privacy risk affects a majority of the customers negatively. It was discovered that majority of customers have at one point lost their mobile phones or receive messages concerning account details (Opili & Willy, 2016).

2.3.2.2 Social Influence and Mobile Banking Adoption

Social influence defined as a change in an individual's feelings, attitudes, thoughts, or behaviors that result from interaction with another person or a group. Social influence is distinct from conformity, authority, and power (Lasserre, 2015). Conformity occurred when an individual expressed a particular opinion or behavior to meet the expectations of a given other or to fit into a certain situation though he did not necessarily hold that view or believe that the action was appropriate (Lasserre, 2015). Authority is the power that is found to be legitimate rather than coercive by those subjected to it (Lasserre, 2015). Power is defined as the ability to coerce or force particular way by controlling her outcomes (Lasserre, 2015). A possible solution for this logical conundrum comes from the analysis of social networks. In Rogers' theory, diffusion systems are a core concept which states that the heart of the diffusion process is the modeling and imitation by potential adopters of their near peers' experiences with new ideas (Rogers, 2003).

TAM models take on the definition of social influence in lines with the one provided by (Laukkanen & Cruz, 2010) that defines social influence as the degree to which one perceives that important others believe she or he should use the new system. They include one or more of the following root constructs: compliance or social norm, which is the perception that most people who are relevant to an individual think he or she should or should not use it. ; Internalization or social factors; and image or identification, which is the degree to which use of the system is perceived to enhance one's status within the social system. Ravichandran et al., (2016) asserted that individuals' behavior is influenced socially. In other words, people use Mobile banking in some specific social situations to keep the interactions with others and enhance the status in their social groups. Most research on this topic was based on TAM and TAM-like models, which have been criticized for how they define and understand social influences (Bagozzi, 2007).

Empirical studies of intention to use and adoption of mobile banking services have shown that social influences have an important role in the diffusion process. Lasserre, (2015) observed that interpersonal influences had positive effects on the social gains and social loss avoidance, increasing the intention to adopt mobile banking services. Similarly, Ravichandran et al., (2016) found a positive effect of the subjective norms in intention to adopt mobile money services. However, not all studies have been able to find evidence that social influence has a role in the adoption of mobile money services. For example, Kasyoki, (2012) explore mobile banking adoption and found that social influence had no significant effect on intention to adopt, which they explain arguing that mobile banking as a service is rather personal and sensitive, so the need for privacy and security supersede any social influence.

An explanation for this inconsistency refers to the points made by Bagozzi (2007), who argued against the limited scope of TAM-like models in their definition of social influences. In the author's perspective, much of the literature extending TAM had been to broaden the approach by introducing additional predictors for PEOU, PU, or intentions, but not to deepen the understanding of how social influences can explain these variables.

A social network, as defined by Lasserre (2015) is the pattern of friendship, communication advice or support existing among members of a social system. The relationship of an individual embedded in a social network increases its opportunities or constraint its actions (Lasserre, 2015). The issue, then, is to try to define what kind of influence social networks have in the adoption and usage of mobile banking services for an individual embedded in them. Three mechanisms drawn from the literature on network analysis are brought forth as possible sources of social influences in the adoption process of mobile money services: social contagion, social learning, and interactivity. (Lasserre, 2015)

Social contagion defined as the process by which consumers influence each other to adopt or use a product and represents the idea that people choose when they come in contact with others who have already adopted, that is, innovation spreads like epidemics (Lasserre, 2015). The fundamental concept behind social contagion is, then, exposure: the more adopters within a person's network means a higher chance of that person copying the behavior. Social contagion emerges from the social structure (Burt, 1987) and makes individuals in similar positions in the social network judge the benefits and

risks of adoption similarly. This phenomenon is rooted in the concept of homophily, that is, the degree to which a pair of individuals who communicate are similar to each other (McPherson, Smith-Lovin, & Cook, 2001). Homophily is an important part of diffusion of innovations theory, as according to Rogers, interpersonal diffusion networks are mostly homophilous. The more homophilous two individuals are, the more likely that their communication was sufficient (Rogers, 2003).

Social learning, on the other hand, is the view that people are not directly affected, but rather individuals learn by observing others using mobile money. They adopt once they have enough evidence that the innovation is worth choosing (Young, 2009). Unlike with social contagion, the key concept here is utility maximization: a potential adopter will observe the experiences of other people to gather enough information before deciding on whether or not to adopt the technology. More actively, social learning implies a process by which observation, communication, and tutoring improve the skills of the individual in using the system.

A third possible source of social influence comes from interactivity. An interactive innovation is an innovation where the likelihood of adoption depends on the number of others who have already adopted the innovation which is sometimes called network effects or network externalities in network analysis (Dahlberg, Mallat, Ondrus, & Zmijewska, 2008). The telephone is a good example of an interactive innovation: if nobody else uses one, then it is useless. Lasserre (2015) indicated that network externalities could have a significant effect on the adoption of mobile money services, depending on whether the system is perceived as having enough users or not.

These three mechanisms provide a perspective on the effect of social influences in the adoption of mobile money based on the adoption of other people in the social network of a particular individual. From the argument of social contagion, when a peer of a person adopts mobile money or uses a particular service provided by the system, this person would likely copy this behavior, and hence be more liable to adopt the system or new services provided by mobile money. This was particularly the case for closer ties within the network. Through social learning, when a peer of a person adopts, this person would be observing and learning from the usage of his or her peer, and hence would be more likely to adopt mobile money as well. Finally, through the argument of interactivity, the more people in a person's network are using mobile money services, the more useful mobile money will be to this individual, since his or her peers may have

a financial exchange with the user as well. This is the idea that had led to the rise of mobile banking apps. These arguments, then, brought forth the following argument: The more peers adopted mobile banking services within a person's social network, the more likely he or she would take mobile banking and the more varied his or her use of mobile banking would be.

2.3.2.3 Regulation and Mobile Banking Adoption

Kenya's Vision 2030 is clear on goals of ensuring that financial inclusion penetrates throughout the country (Mwega, 2014). It stipulates that Kenya should enhance financial inclusion by decreasing the share of the population without access to finance by around 20% (Mwega, 2014). This means that there is need to introduce legal and institutional reforms that would build trust, enhance transparency in transactions, and ensure enforcement of justice for this vision to be achieved (Duncombe & Boateng, 2017; Mwega, 2014).

Issues of regulation and policy are suggested as significant constraints on m-finance adoption by CGAP (Duncombe & Boateng, 2017). The scrim to the regulatory concerns the convergence of two previously distinct and separate regulatory regimes, those of telecommunications and those of banking. The blurring of the distinction between services that are bank-led and those that are not was therefore brought forth. Bank-led is where financial institution or bank delivers m-banking service customers through a retail agent (Duncombe & Boateng, 2017). Non-bank-led is where customers cash for e-money stored in a virtual e-money account on the server organization that is not a bank, such as a mobile network operator (Duncombe & Boateng, 2017).

Regulators require interoperability and interconnection between mobile money networks to enable smooth implementation of mobile banking in the region (Nyaga, 2017). With few models on which to draw, the East Africa Community must find a way to address the convergence of the financial and telecommunications sectors to enable maximum benefits from mobile banking, especially for the poor (Nyaga, 2017). CBK warns of imminent threats such as operational risk, financial fraud and money laundering (Alliance for Financial Inclusion, 2010).

Markets should be liberalized to the level where there are capacities to harness market forces by putting in place policies that allow technologies such as mobile banking to penetrate into the market (Beck, 2006). The supervisory and regulatory capacities, as

well as the possibilities for markets to exercise discipline, should keep up with the potential of financial institutions to take the risk otherwise, there was great concern on how they operate (Beck, 2006). Concerned authorities that controls and monitors should try to stay incentive compatible throughout the reform process to encourage adoption of the technology (Beck, 2006). Most importantly, implicit insurance or unlimited explicit should be avoided for creditors, depositors and especially owners of financial institutions (Beck, 2006).

Many of the mobile initiatives are wholly led, in some cases partial led by non-bank organizations that are normally outside the scope of financial regulation, and with whom the financial regulator has had no or little contact (Makin, 2010). This has naturally led to concern amongst regulators, and, for good or bad, threatens to disrupt the regulation of the financial sector in many of these countries (Makin, 2010).

Previous studies on the effects of regulation on mobile banking adoption suggest that there was lack of fair play and interoperability in mobile banking operations (Andiva, 2015; Makin, 2010; Mwaura, 2009).

Interoperability defined as the interconnection of mobile money services either with external parties or between providers (Gazette, 2014). There has been reported ease of Interoperability due to Current Regulation. Providers and Consumers benefit from the interoperability through; Cost savings by reduction in the transaction fees, the unlimited choice for customers since they need not favor an MNO because of their network coverage. Increased convenience as mobile money is sent across networks and can be received and stored in a mobile wallet seamlessly. The benefit of spreading the network effect as the number of transactions in an operable environment increase. Reduction of barriers to entry, Agents enjoy increased income streams from the expanded consumer base (Andiva, 2015.) The mobile phone operators in Kenya have joined the bandwagon through the launch of the interoperable mobile wallet, which will see users send and receive money through one common wallet irrespective of their mobile networks.

The Competition Authority of Kenya (CAK) which is a body charged with the mandate of regulating and creating a fair field in all sectors of the economy ordered all players in the mobile money industry including commercial banks and Telco's to reveal to customers the charges involved in mobile money transactions. This should have led to

cost savings to users (CAK, 2016). Hence the third argument: Regulation had a positive effect on adoption of mobile banking amongst commercial banks customers.

2.4 Research Gaps

Researcher's such as Haonga (2015), Kasyoki (2012), Lasserre (2015) and Ravichandran et al., (2016) presented evidence for a number of variables including Perceived relative advantage, Social Influence, and Regulatory Factors influencing consumers intention to adopt mobile banking. However previous studies were done under different regulatory environment and applied variables from one or more of the best known Technology Adoption Models, and they were based on the dominance of the M-Pesa platform. This study meant to shed light on factors affecting mobile banking adoption in Nairobi County using an Integrated Model Framework.

The concept of mobile banking used in this study was different from previous studies of Haonga (2015), Kasyoki (2012), Lasserre (2015) and Ravichandran et al., (2016) that focused on the M-pesa platform, as it combined those that operate on the M-Pesa platform, those that rode on other provider's platform and the bank's platform. This study, therefore, sought to find out the effect of other platforms on mobile banking and find out whether Mpesa was still dominating the market. Previous studies had been carried out in a different regulatory environment; this study took into considerations the recent regulatory changes on mobile banking allowing interoperability.

2.5 Conceptual Framework

The conceptual framework below helps to explain the influence of perceived relative advantage, which is broken down to perceived ease of use, usefulness, and risk. Moreover, how they affect awareness, interest time and frequency of use. It explains social influence broken down into: social contagion, learning and interactivity and how they affect awareness, interest time and frequency of use. Lastly, it explains how regulation of mobile banking adoption affect awareness, interest time and frequency of use.

Figure 2.1: Factors Influencing Adoption of Mobile Banking and Adoption of Mobile Banking

Independent variables

Dependent variable

Perceived relative advantage

- Perceived ease of use
- Perceived usefulness
- Perceived risk

Social influence

21

Adoption of Mobile banking



Source: Author (2018)

2.5.1 Operationalization

The researcher operationalized perceived relative advantage, socio influence, regulation and mobile banking adoption as illustrated in table 2.1 below

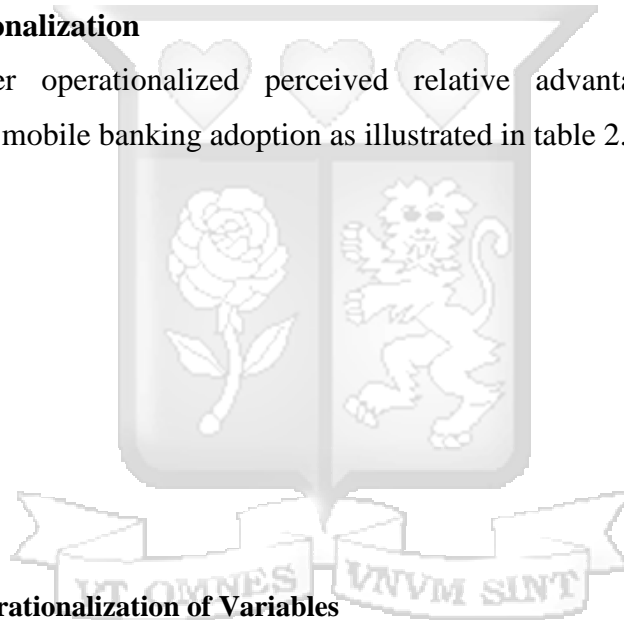


Table 2.1: Operationalization of Variables

Variables	Constructs/ Indicators	Operation Definition	Rating Measure s	Source (s)
Independent variables Perceived relative advantage	Perceived ease of use	The degree to which a person believes that using a particular system would be free of effort	Likert scale	(Davis, 1989) (Laukkanen, 2008)
	Perceived usefulness	The degree to which an individual believes that using a particular system enhances job performance	Likert scale	(Davis, 1989) (Lee et al., 2007)

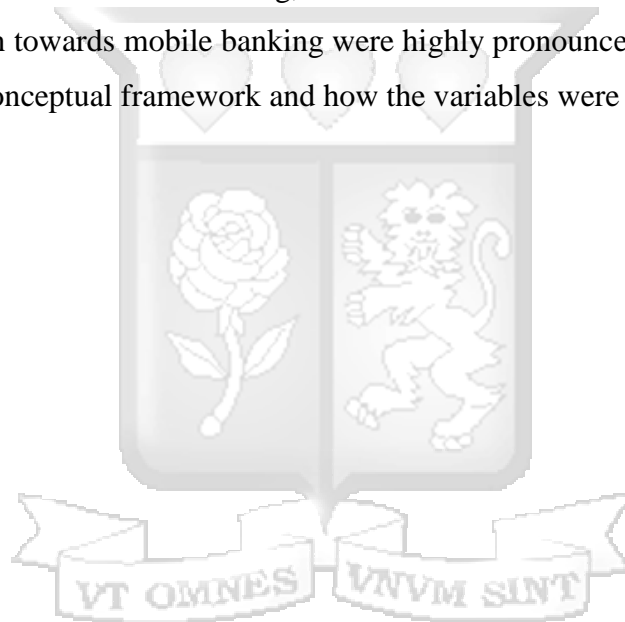
	Perceived risk	The perceived potential loss due to a hacker or fraud compromising the security of mobile banking bank user	Likert scale	(Lee et al., 2007) (Venkatesh & Davis, 2000)
Social influence	Social contagion	The process by which consumers influence each other to adopt or use a product	Likert scale	(Lasserre, 2015)(de Silva et al., 2011)
	Social learning	Is the view that people are not directly influenced, but rather individuals learn by observing others using mobile banking	Likert scale	(Lasserre, 2015) (de Silva et al., 2011)
	Interactivity	An innovation where the likelihood of adoption depends on the number of others who have already adopted the innovation	Likert scale	(Lasserre, 2015) (de Silva et al., 2011)
Regulation	Interoperability	Refers to the interconnection of mobile money services either between providers or with external parties.	Likert scale	(Andiva, 2015) (Mwega, 2014)
	Cost saving	An action that will result in the fulfillment of the objectives of purchase, at a cost lower than the historical cost or the projected cost.	Likert scale	(Andiva, 2015) (Mwega, 2014)
Dependent variable Adoption of Mobile banking	Adoption of mobile banking	Adoption of mobile banking is defined as demonstrable willingness to employ mobile banking technology for the tasks it has been designed to support.	Likert scale	(Donaldson, Preston, & Preston, 1995; Lee et al., 2007; Rogers, 2003)
	Awareness	Knowledge of existence of mobile banking.	Likert scale	(Lee et al., 2007)(Lasserre, 2015)
	Frequency of use	The number of times one uses mobile banking in the last one month	Likert scale	(Everett, 1995; Lee et al., 2007)
	Interest	Customer attention to mobile banking services	Likert scale	(Lee et al., 2007)

	Length of time of using product	Period from when first use on mobile banking to date	Likert scale	(Rogers & Everett, 1983)
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Source: Author (2018)

2.6 Chapter Summary

The chapter begins with a theoretical review. The study used diffusion of innovations theory (DIT) Technological Acceptance Model (TAM) and theory of reasoned action (TRA) The Empirical review of literature above suggested that among the factors that influence adoption of mobile banking, Perceived Relative Advantage, social influence, and Regulation towards mobile banking were highly pronounced. The chapter ends by presenting a conceptual framework and how the variables were operationalized.



CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The chapter aims at explaining how data was gathered and analyzed to attain research objectives. The chapter is divided into various sections as follows: research philosophy, research design, target population, sampling technique, data collection methods, data analysis and ethical considerations.

3.2 Research Philosophy

Research philosophy is a belief about the way in which data about a phenomenon should be gathered, analyzed and used (Creswell, 2009). The research philosophy that was put into consideration in the study was positivism. This meant that the study assumed that only factual knowledge is trustworthy (Aliyu, Bello, Kasim, & Martin, 2014). Positivistic studies only require the researcher to collect data and interpret it (Lancaster, 2005). Research findings generated are observable and statistically quantifiable. Positivism relies on theory to develop a hypothesis to be tested during the research process (Aliyu et al., 2014)

3.3 Research Design

The study adopted a descriptive research design to determine the correct profile of events, situation, and people (Saunders et. al., 2015). The study adopted a Survey research design because it enabled the researcher to draw a broad range of data for comparison purposes from commercial banks customers. The survey method was applied whereby the researcher administered a questionnaire instrument that gave statistical data for analysis (Creswell, 2003). A cross-sectional survey design was employed for this study. A cross-sectional survey gathers data to make an inference of the desired population at a particular time (Creswell, 2003).

3.4 Target Population

Target Population refers to the units for which the findings of the study are meant to generalize (Saunders, Lewis, & Thornhill, 2009). The study focused on commercial banks' customers in Kenya since they were most likely to have come across or even have used mobile banking technology in doing their banking tasks. Since commercial banks are a good representation of the entire financial sector, the research got the

necessary information it needed in the study. Since all the 42 banks have representation in Nairobi County, the survey was done in Nairobi County. The number of customers who hold accounts in each of the branches of the 42 banks was unknown to the researcher but estimated to be much more than 10, 000.

3.5 Sampling Technique

The study adopted the probability sampling method to ensure generalizability. A sample of 384 respondents was randomly selected from the general population of customers in the 42 banks located in Nairobi. The sample size is supported by (Saunders et al., 2009), who recommends a minimum sample size of 383 for a population size of over 100 000 given a 95% confidence level for different margin of error. According to Saunders, et al., (2009), sampling is used when it is impracticable to survey entire population, the researcher is faced with budget or time constraints, or researcher needs survey results quickly.

The sampled respondents were selected using simple random sampling method. This method is probabilistic, as it is best for survey research. According to Saunders et al., (2009), simple random sampling involves the researcher randomly selecting the sample from the sampling frame using an online random number generator or a computer. The sampling frame in this study were the 42 commercial banks operating in Kenya. This method was chosen as it was accurate, easily accessible and best for small sample size (Saunders et al., 2009). Mugenda and Mugenda (2003) recommends a sample size of between 10% and 30% is considered adequate. The research, therefore, sampled 12.24% of the population. Thus six banks were randomly selected from the 42 banks.

To calculate a sample size for the main focus of this study, that is, commercial banks customers in Kenya, Saunders et al., (2009) formula for sample calculation was employed as below.

$$n = \frac{z^2 pq \times 100}{d^2}$$

Where:

n = desired sample size assuming the population is greater than 10,000

z = standard normal deviation set at 1.96 which statistically corresponds to 95% confidence level

p= proportion of target population estimated to have adopted internet banking. Since there is no reasonable estimate, this study has used the maximum of 50%

$$q = 1.0 - p$$

d = degree of desired accuracy. This study sets it at 0.05, which correspond to 1.96

$$n = \frac{(1.96)^2 \times 0.5 \times (1.0 - 0.5)}{(0.05)^2} \times 100$$

n = 384.16 Approximately 384 bank customers

Therefore, the sample size was Three Hundred Eighty-Four (384) commercial banks' customers.

3.6 Data Collection

The study used primary data to collect information from respondents by use of a structured questionnaire. A questionnaire is a data collection instrument in which each person (respondent) is asked to respond to the same set of questions in a pre-determined order (Burgess, 2001). The survey questionnaire consisted of three parts. The first section was the subject's demographic information. The demographic variables included age, gender, and the level of education. The second section had each of the subject's perceptions of each variable in the model using a format of a Likert scale. The third part asked the respondent questions on mobile banking adoption and used a Likert scale. Most of past research on mobile banking adopted the format used (Doline & Solomon, 2014; Haonga, 2015; Lasserre, 2015).

The researcher or a research assistant delivered the questionnaire by hand to the respondents and waited for some of the respondents to fill in the questionnaire to enhance respondent participation. Eighty-four (84) questionnaires were distributed to randomly selected customers in each of the six banks' Head Offices where Head of Research or such other appointee by the said bank gave authority over the branch survey. To ensure randomness, every third customer who entered the bank between 10:00 am and 4:00 pm in each of the six banks' chosen branch was issued with a questionnaire. This was repeated until all the questionnaires per bank were fully distributed. Due to bank bureaucracies, Four banks gave accent for the researcher to interact with customers. One bank took the Questionnaires and had its staff give the questionnaires to their customers. Questionnaires were however distributed to other two banks based on the bank's proximity

to where respondent was at that moment of the interview. This low cost method of data collection even when universe is large was used, and it provided the interviewer freedom from bias (Kothari, 2004)

3.7 Data Analysis

The data was collected, edited and cleaned to check on irrelevancies, and to ensure completeness, consistency, and accuracy of the responses. Dummy variables were used to identify the qualitative aspect of the questionnaire to facilitate analysis of the data. Data were coded for ease of data entry. Diagnostic tests were then carried out. The researcher imported the data into the SPSS version 17.0 where descriptive statistics (standard deviation, mean, median), correlation analysis (Pearson's) and multiple regression analysis were conducted in that order.

Respondents profile data was also analyzed using descriptive statistics such as frequencies and percentages. Normally, descriptive statistics are conducted to provide simple summaries about a population or sample (Kothari, 2004). The four assumptions of multiple regressions are, normality, linearity, independence of error terms and homoscedasticity of variance (Cresswell, 2003). There is need to indicate the inferential statistical tests used to examine the hypotheses in the study (Creswell, 2009). There were three objectives developed in this study to be tested; the following regression model was utilized:

$$Y = \beta_0 + \beta_1PRA + \beta_2SI + \beta_3R + \mu_i \text{ (overall equation)}$$

Where Y = Adoption of mobile banking, Perceived Relative Advantage (PRA), Social Influence (SI), Regulation (R).

In all regressions, β_0 was the constant (intercept), β_1 , β_2 , β_3 were the corresponding coefficients for each respective independent variable. μ_i is the error term, which reflects those variables or factors that were not, considered in the regression equation.

Testing the Model

The following tests were performed and explained; correlation coefficient, coefficient of determination T-test and Multicollinearity among the independent variables.

Correlation coefficient (R)

The correlation analysis shows a correlation between all perceived characteristics of innovation and mobile banking adoption (Limthongchai & Speece, 2003). The correlation coefficient is usually within the range of values between -1 and 1 (Kothari, 2004). A correlation of -1 indicates a perfect negative correlation while a correlation of 1 indicates a perfect positive correlation. One of 0 indicates no relationship. The closer the correlation coefficient is towards -1 or 1, the stronger the association between the variables (Lancaster, 2005).

The coefficient of determination (R^2)

This describes the degree of variability shared by variables. It is a square of the coefficient of correlation (R^2); it predicts about one variable if the determination degree is known. R^2 ranges from 0 to 1. If a model is closer to 1, then it has a better fit with the data (Lancaster, 2005).

T-test:

T-test enabled the researcher to test whether the dependent variables are individually influenced by the independent variable. T-values can be obtained from the regression output and interpreted such that if the values are less than 0.05, they are significant and should be included in the model otherwise insignificant (Saunders et al., 2009)

Descriptive Analysis

Descriptive analysis is largely the study of distributions of one variable and involves rearranging, ordering and manipulating data to generate descriptive information (Kothari, 2004). In this study, Descriptive Statistics such as mean standard deviation, and the median were applied.

Multi-Collinearity

Multi-collinearity refers to situations where there is a high correlation between independent variables in the model, which results in a high coefficient of determination. Variance inflation factor (VIF) was used to test whether the presence of multicollinearity is statistically significant (Kandananond, 2012). The table 3.1 below provides the Results of the Multicollinearity Check Using Tolerance and VIFs.

Table 3.1: VIF and Tolerance level

Model	Collinearity Statistics	
	Tolerance	VIF
4 (Constant)		
Perceived relative advantage factors	.572	1.748
Social-influence factors	.984	1.016
Regulatory factors	.578	1.730

Source: Survey Data

Table 3.1 above shows $VIF < 10$ hence its concluded that the presence of multicollinearity is not statistically significant.

3.8 Research Quality

Research quality for this study was measured by the validity as well as the reliability of findings and techniques used in the research. Reliability is the aspect that ensured consistency was upheld throughout the research. Credibility was also a priority in this study to allow it obtain true findings.

3.8.1 Reliability Tests.

Reliability is the extent to which a set of variables or a variable is consistent with what it is intended to measure. If multiple measurements are taken, reliable measures are all consistent with their values (Saunders et al., 2009). Cronbach's alpha was used to test the reliability of the questions asked under different groups. A value of alpha greater than 0.75 implies that the data are consistent regarding measurements given (Saunders, Bishop, & Barrett, 2003). From the table 3.2 below, the different constructs show that the questions asked under each construct were consistent except for social influence factors, which had an alpha value of less than 0.75.

Table 3.2: Cronbach's Alpha

variable	Cronbach's Alpha	N of Items
Perceived relative advantage factors	.896	11
Social influence factors	.595	6
Regulatory factors	.816	8
Mobile Banking Adoption	.807	4

Source: Survey Data

3.8.2 Validity

The extent to which a set of measures or a measure represents the concept of study the degree correctly to which it is free from any systematic or nonrandom error is validity. Validity is concerned with how well the concept is defined by the measure(s). Discriminant validity and Convergent validity were used to determine the validity of each group of related questions. Convergent validity assesses the degree to which two measures of the same concept are correlated. From the data, data from the same concept is expected to have a very high correlation, which confirms the theory that measures from the same construct are related. Discriminant validity is the degree to which two conceptually similar concepts are distinct (Kothari, 2004). The study's interest is to be able to show that measures from different constructs have a low correlation

3.9 Ethical Consideration

The researcher was aware of the need to maintain confidentiality while conducting this research. Confidential information was treated with the level of confidentiality it deserved. Where the information was deemed sensitive and private, then the researcher upheld anonymity. Concealing identity of the respondents and the information of their account was required by the participants so that no one even the researcher got to know. The privacy of the study data collected was maintained unless directed otherwise by the involved participants. Also upon request by respondent, the researcher had a letter from the University that permits to conduct academic research.

CHAPTER 4

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

The research overall objective was to examine the factors influencing adoption of mobile banking by commercial customers in Nairobi. Further, it was broken down into three specific objectives as follows: To determine the extent to which perceived relative advantage influences mobile banking adoption among commercial banks' customers. To examine the extent of social influence on mobile banking adoption among commercial banks' customers. To establish the extent to which regulation influences adoption of mobile banking by commercial banks' customers. This chapter presents an analysis and a report from the study through the following subheadings: response rate, demographic information, descriptive statistics, correlation analysis, multiple linear regression and finally a summary.

4.2 Response Rate

Out of the 500 questionnaires that were distributed to respondents, 384 questionnaires were successfully selected for analysis. This represented 100% of the target sample. A response rate considered excellent for research is of 70% and above (Saunders et al., 2009).

4.3 Demographic Information

This section shows the age, gender, level of education and income level of the respondents. For this study, the target population was commercial banks customers in Kenya.

4.3.1 Gender

Table 4.1: Gender profile of Respondents

Gender	Frequency	Percent
Male	239	62.2
Female	145	37.8
Total	384	100.0

Source: Survey Data

The data in table 4.1 above shows that males were the largest number of respondents at 62.2%, while the female was at 37.8%. This indicates that majority of commercial banks customers are male

4.3.2 Age

Table 4.2: Age of Respondents

Age	Frequency	Percent
18-30 years	185	48.2
31 - 40 years	126	32.8
41 - 50 years	34	8.9
51 - 60 years	21	5.5
61 and Above years	18	4.7
Total	384	100.0

Source: Survey Data

The age of the respondents was required for the study. From the table 4.2 above 185 respondents or 48.2 % were of the age of 30 years or below, 126 respondents represented 32.8% of all respondents were aged between 31 and 40 years while 19.1% were above 40 years. This implies that amongst the respondents all age brackets were represented thus indicated a population representative sample regarding age.

4.3.3 Level of Education

Table 4.3: Respondents Level of Education

Level of education	Frequency	Percent
Below diploma	81	21.1
Diploma	76	19.8
Bachelor's degree	166	43.2
Master's degree	56	14.6
Doctorate Degree	5	1.3
Total	384	100.0

Source: Survey Data

Table 4.3 above indicates that 63% of the respondents were either Degree or Diploma holders while only 21% held below Diploma education.

4.3.4 Income Level

Table 4.4: Respondents Income level

level of your monthly net Income	Frequency	Percent
Ksh. 50000 and Below	198	51.6
Ksh. 50001 - Ksh. 100000	119	31.0
Ksh. 100,001 – Ksh. 300,000	44	11.5
Ksh. 300,001 – Ksh. 800,000	11	2.9
Above Ksh. 800,000	12	3.1
Total	384	100.0

Source: Survey Data

Table 4.4 above shows that 51.6% of the respondents earned a monthly salary of KES. 50,000 and below while 82.6% of the respondents earned a monthly salary of KES 100,000 and below monthly.

4.3.5 Adoption Of Mobile Banking

Table 4.5: Adoption Of Mobile Banking Respondents profile

Do you have Mobile banking	Frequency	Percent
Yes	366	95.3
No	18	4.7
The platform you access your mobile banking	Frequency	Percent
Mobile banking app	169	44
Mpesa platform	104	27.1
Mobile banking sim card	54	14.1
Through registration from my bank	51	13.3
Others specify	6	1.6
The period you have used mobile banking	Frequency	Percent
Below 6 months	61	15.9
6 months - 1 Year	56	14.6
1 - 2 years	86	22.4
2 - 3 years	34	8.9
Above 3 years	147	38.3

Source: Survey Data

Table 4.5 above shows that 69.6% of the 95.3% respondents that had mobile banking had been using it for more than 1 year while 30.5% had been using mobile banking for less than 1 year. 44.0% of the respondents were accessing mobile banking using the app, 14.1% using mobile banking sim card, 27.2% through the Mpesa platform, registration from the bank was 13.3% while other platforms were 1.9%.

4.4 Factors Influencing Adoption of Mobile Banking Descriptive Statistics

This research sought to examine factors that influenced adoption of mobile banking services amongst commercial banks' customers in Kenya. The factors are perceived relative advantage, Social-influence factors, and Regulatory factors.

4.4.1 Perceived Relative Advantage and Adoption of Mobile Banking Descriptive Statistics

The first objective was to determine the extent to which perceived relative advantage influences mobile banking adoption among commercial banks' customers. A set of eleven questions representing different aspects of perceived relative advantage were presented to the respondents, and they were, in turn, requested to express their degree of agreement on a Likert scale where 1 was strongly disagree, 2 was disagree, 3 was somewhat agree, 4 was agree, and 5 was strongly agreed. The respondents indicated their level of agreement with the 11 questions. The results were first described using descriptive statistics where mean and standard deviation was computed to give an adequate description of perceived relative advantage in relation to the adoption of mobile banking. As shown in Table 4.6 below, the overall mean was 3.92 while the standard deviation was 1.16. This implied that overall, the respondents agreed with the perceived relative advantage.

Table 4.6: Perceived Relative Advantage

Table 1

Descriptive Statistics			
Perceived relative advantage	N	Mean	Std. Deviation
Using mobile money would increase my efficiency	384	4.26	1.158
Is mobile banking service reliable	384	4.23	1.099
I find mobile banking useful for my banking needs.	384	4.21	1.162
Mobile money seems easy to use	384	4.12	1.119
Using mobile banking would help me pay more quickly	384	4	1.231
The login and sign off are easy	384	3.97	1.147
There is security in the transactions carried out	384	3.89	1.074
Using mobile money does not require a lot of mental effort	384	3.79	1.235
I would not feel safe providing personal privacy information over the mobile money system	384	3.74	1.209
I value trust more in deciding to use mobile banking technology than the technology itself	384	3.58	1.133
Cost of use influences my choice of mobile banking	384	3.38	1.214
Valid N (listwise)	384	3.92	1.16

Source: Survey Data

4.4.2 Social Influence and Adoption of Mobile Banking Descriptive Statistics

The second measure pertinent to mobile banking adoption was social influence. A Likert scale where 1 was strongly disagree, 2 was disagree, 3 was somewhat agree, 4 was agree, and 5 was strongly agreed was used. The overall mean values were used as indicators of their level of agreement with the statements. As shown in Table 4.7 below, the overall mean was 2.97 with a standard deviation of 1.23, indicating that the respondents disagree with social influence as a measure of mobile banking adoption.

Table 4.7: Social Influence

Descriptive Statistics			
Social Influence	N	Mean	Std. Deviation
I send money to my peers using mobile banking	384	3.83	1.172
People I regard as important approve my use of mobile banking	384	3.77	1.137
My peers have adopted mobile banking because I use it	384	2.77	1.258
I use Mobile Banking since its fashionable to use it	384	2.62	1.358
My social standing will diminish if I don't adopt mobile banking	384	2.58	1.241
I use mobile banking since my peers use it	384	2.28	1.223
Valid N (listwise)	384	2.97	1.23

Source: Survey Data

4.4.3 Regulatory factors and Adoption of Mobile Banking Descriptive Statistics

The third pillar of the mobile banking adoption is regulatory factors. As such, the study sought to determine regulatory factors affecting adoption of mobile banking using a set of 6 questions. Once again, a Likert scale where 1 was strongly disagree, 2 was disagree, 3 was somewhat agree, 4 was agree, and 5 was strongly agreed was used. As shown in Table 4.8 below, the overall mean was 3.77 with a standard deviation of 1.13, indicating that the respondents agree with regulation as a measure of mobile banking adoption.

Table 4.8: Regulatory Factors

Descriptive Statistics			
Regulatory factors	N	Mean	Std. Deviation
Mobile banking Regulation has led to increased convenience	384	4.01	1.079
I can now tell how much a transaction on mobile banking costs	384	3.99	1.114
I can now comfortably send money across banks and mobile money operators	384	3.92	1.182
Mobile banking regulation has led to increased choices	384	3.82	1.04
My knowledge of the cost of the transaction will influence my decision to use mobile banking	384	3.79	1.175
I am aware of the regulatory changes in Mobile Banking that allow interconnection of mobile money services between providers.	384	3.66	1.136
Mobile banking Regulation has reduced cases of fraud	384	3.55	1.23
There is a level playing field amongst mobile banking operators giving me alternative channels	384	3.41	1.09
Valid N (listwise)	384	3.77	1.13

Source: Survey Data

4.4 Adoption of Mobile Banking Descriptive Statistics

On the measurement of mobile banking adoption, the study sought to determine the level of awareness, interest, and frequency of use and length of time using a set of four questions. Once again, a Likert scale where 1 was strongly disagree, 2 was disagree, 3 somewhat agreed, 4 was agree and 5 strongly agreed was used. As shown in Table 4.9 below Interest to learn, more about MB was indicated by the respondents with a mean of 3.94 and standard Deviation of 1.195. The frequency of use of MB by the respondents had a mean of 4.22 and standard Deviation of 1.046. The respondents with a mean of 3.63 and standard Deviation of 1.100 indicated awareness about MB. The respondents with a mean of 4.24 and standard Deviation of 1.163 indicated the length of time of using MB. The overall mean was 4.01 with a standard deviation of 1.13, indicating that the respondents agree with adoption of mobile banking.

Table 4.9: Adoption of Mobile Banking**Descriptive Statistics**

Adoption Of Mobile Banking	N	Mean	Std. Deviation
I have used mobile banking in the last month	384	4.24	1.163
I frequently use mobile banking services	384	4.22	1.046
I am interested in learning more about Mobile Banking Services	384	3.94	1.195
I am aware of the latest developments and changes in mobile banking	384	3.63	1.1
Valid N (list wise)	384	4.01	1.13

Source: Survey Data**4.5 Pearson's Correlation Analysis**

The study interest was to examine factors that influenced adoption of mobile banking services among commercial banks' customers in Kenya. A non-parametric method Pearson's correlation analysis was first conducted to assess the strength and direction of the relation between the independent (perceived relative advantage, Social-influence factors, and Regulatory factors) and the dependent variables (Mobile banking Adoption) as shown in Table 4.10 below.

In Table 4.10 below, correlation at the 0.01 level between variables is shown by two asterisks (**). Pearson's rank correlation was used to check if there was an association between each of the independent variables and the dependent variable. MBA in this output represents Mobile Banking Adoption, PRAF represents Perceived Relative Advantage Factors, SIF represents Social Influence Factors, and RF represents Regulatory Factors. Pearson's correlation coefficient (r_s) ranges from -1 to 1. 00- .19 indicates a very weak relationship, a weak relationship is indicated by .20-.39, a moderate relationship is indicated by .40-.59, the strong relationship is .60-.79 shows and finally .80 -1.0 indicates the very strong relationship. The results in Table 4.10 indicated that there was a very weak relationship between social influence factors and Mobile banking adoption. The relationship was negative but not statistically significant at 1% significance level ($r_s = -0.069$, $p\text{-value} = 0.176 > 0.01$). PRAF and RF had a statistically significant positive relationship with MBA ($r_s = 0.605$, $p\text{-value} = 0.000 < 0.01$) and ($r_s = 0.673$, $p\text{-value} = 0.000 < 0.01$) respectively.

Table 4.10: Pearson’s Correlation Analysis Results

		Correlations			
		Perceived relative advantage factors	Social-influence factors	Regulatory factors	Mobile Banking Adoption
Perceived relative advantage factors	Pearson Correlation	1	.126*	.649**	.605**
	Sig. (2-tailed)		.014	.000	.000
	N	384	384	384	384
Social-influence factors	Pearson Correlation	.126*	1	.073	-.069
	Sig. (2-tailed)	.014		.152	.176
	N	384	384	384	384
Regulatory factors	Pearson Correlation	.649**	.073	1	.673**
	Sig. (2-tailed)	.000	.152		.000
	N	384	384	384	384
Mobile Banking Adoption	Pearson Correlation	.605**	-.069	.673**	1
	Sig. (2-tailed)	.000	.176	.000	
	N	384	384	384	384

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Survey Data

4.6 Regression Analysis

The study main objective was to examine factors that influenced adoption of mobile banking services among commercial banks’ customers in Kenya. Once there was established the presence of a relationship between the dependent variable and independent variables, multiple regression analysis was utilized to establish the effect of each of independent variable to dependent variables individually. The overall significance of the model was also established using analysis of variance (ANOVA).

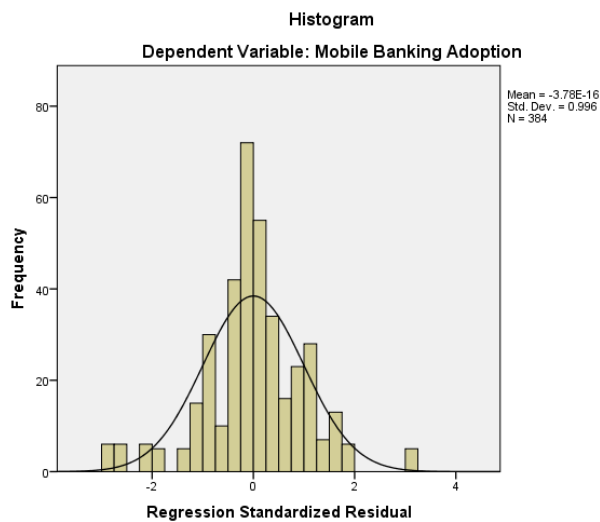
4.6.1 Diagnostics Tests

This section entails the diagnostic tests carried out before the multiple-regression.

4.6.1.1 Test for Normality

A histogram was used to check for normality by having a normality curve drawn on the histogram. If the histogram is well covered by the normality, density curve it implies the data is normal (Kandananond, 2012). From the figure 4.1 below, the histogram was well curved with Q-Q plot implying that the data was normal.

Figure 4.1: Histogram



Source: Author (2018)

4.6.1.2 Test for Autocorrelation

Autocorrelation refers to a situation where the residuals in the model are correlated which would have a negative influence on the model that is correct inference cannot be made. Durbin Watson statistic was used to test for autocorrelation. If the calculated Durbin Watson statistics is closer two, there is no autocorrelation (Cohen, 2000). The table 4.11 below shows that DW statistics = 1.886 \cong 2 hence it implies that there is no autocorrelation.

Table 4.11: Durbin Watson statistic

Model Summary ^b	
Model	Durbin-Watson
4	1.886

Source: Survey Data

4.6.2 The extent to which perceived relative advantage influences mobile banking adoption among commercial banks' customers.

In this regression model, mobile banking adoption was the dependent variable and independent variable was perceived relative advantage. The regression model from Table 4.12 below is given by;

$$MBA = 1.427 + 0.644 * PRAF$$

Where;

1.427 is the constant term that is when there is no perceived relative advantage; mobile banking adoption was 1.427

0.644 = Coefficient of perceived relative advantage factor. For every unit increase in perceived relative advantage, its expected that mobile banking adoption among commercial bank to increase by 0.644 holding other factors constant.

Table 4.12 below presents a coefficient of correlation (R), Coefficient of determination (R Square), Adjusted R square and standard error of the estimate. The R-value explains what percentage of the model can be described by the data. In this case, 60.5% of the data explains the model. R square explains the percentage of the independent variables that explain the dependent variable. In this case, 36.6% of the Perceived relative advantage explains mobile banking adoption and the rest (100-36.6=63.4%) is due to unexplained variations. Adjusted R square is an extension of the R square, and it takes care of the number of independent variables in the model. So from the table, there is only one independent variable, therefore, cannot be used.

Table 4.12 below presents a summary of the model

Table 4.12: PRA and mobile banking adoption regression results

Variables Entered/Removed^a			
Model	Variables Entered	Variables Removed	Method
1	Perceived relative advantage factors		Enter

a. Dependent Variable: Mobile Banking Adoption
 b. All requested variables entered.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.605 ^a	.366	.364	.930

a. Predictors: (Constant), Perceived relative advantage factors

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190.585	1	190.585	220.257	.000 ^b
	Residual	330.538	382	.865		
	Total	521.122	383			

a. Dependent Variable: Mobile Banking Adoption
 b. Predictors: (Constant), Perceived relative advantage factors

Coefficients^a					
Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	1.427	.189	7.544	.000
	Perceived relative advantage factors	.644	.043	14.841	.000

a. Dependent Variable: Mobile Banking Adoption
 a. Dependent Variable: MBA

Source: Survey Data

The overall significance of the model. Analysis of variance (ANOVA) tells us whether the percentage explained by the independent variables is statistically significant. From the table 4.12 above it has concluded that the model is statistically significant at 1% significance level (F value = 220.257, p-value = 0.000 < 0.01).

Table 4.12 above looks at the individual independent variables to ascertain their effect to the model, and whether they are statistically significant. From the table PRAF was statistically significant at 1% level of significance (T value = 14.841, p-value = 0.000 < 0.01). Hence from the significant variable, the final model was;

$$\text{MBA} = 1.427 + 0.644 * \text{PRAF}$$

4.6.3 The extent of social influence on mobile banking adoption among commercial banks' customers.

In this regression model, mobile banking adoption was the dependent variable and social influence as the independent variable. The regression model from Table 4.13 below is given by;

$$\text{MBA} = 4.304 - 0.59 * \text{SIF}$$

Where;

4.304 is the constant term that is when there is a social influence; mobile banking adoption was 4.304

0.59 = Coefficient of social influence factor. For every unit increase in social influence factor, mobile banking adoption among commercial bank decreases by 0.59 holding other factors constant.

Table 4.13 presents a summary of the model

Table 4.13: SI and Mobile banking Adoption regression results

Variables Entered/Removed^a			
Model	Variables Entered	Variables Removed	Method
2	Social-influence factors ^b		Enter

a. Dependent Variable: Mobile Banking Adoption
b. All requested variables entered.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.069 ^a	.005	.002	1.165

a. Predictors: (Constant), Social-influence factors

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
2	Regression	2.500	1	2.500	1.841	.176 ^b
	Residual	518.623	382	1.358		
	Total	521.122	383			

a. Dependent Variable: Mobile Banking Adoption
b. Predictors: (Constant), Social-influence factors

Coefficients^a					
Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
2	(Constant)	4.304	.133	32.395	.000
	Social-influence factors	-.059	.043	-1.357	.176

a. Dependent Variable: Mobile Banking Adoption
a. Dependent Variable: MBA

Source: Survey Data

Table 4.13 above presents a coefficient of correlation (R), Coefficient of determination (R Square), Adjusted R square and standard error of the estimate. The R-value explains what percentage of the model can be described by the data. In this case, 6.9% of the data explains the model. R square explains the percentage of the independent variables that can be used to explain the dependent variable. In this case, 0.5% of the social influence can be used to explain mobile banking adoption, and the rest (100-0.5=99.5%) is due to unexplained variations. Adjusted R square is an extension of the R square, and

it takes care of the number of independent variables in the model. From the table, there is only one independent variable, therefore, it was not used.

Table 4.13 above also presents the overall significance of the model. Analysis of variance (ANOVA) tables tells us whether the percentage explained by the independent variables is statistically significant. From the table 4.13 above its concluded that the model is not statistically significant at 5% significance level (F value = 1.841, p-value = 0.176 > 0.05).

Finally, table 4.13 above looks at the individual independent variables to ascertain there effect in the model and whether they are statistically significant. From the table SIF was not statistically significant at 5% level of significance (T value = 1.357, p-value = 0.176 > 0.05). Hence, from the model is not significant.

4.6.4 The extent to which regulation influences adoption of mobile banking by commercial banks' customers.

In this regression model, mobile banking adoption was used as the dependent variable and regulatory factor as the independent variable. The regression model from Table 4.14 below is given by;

$$MBA = 1.261 + 0.725 * RF$$

Where;

1.261 is the constant term that is when there are no regulatory factors; mobile banking adoption was 1.261

0.725 = Coefficient of regulatory factors. For every unit increase in regulatory factor, mobile banking adoption among commercial bank is expected to increase by 0.725 holding other factors constant.

Table 4.14 presents a summary of the model1

Table 4.14: RF and Mobile Banking Adoption regression results

Variables Entered/Removed^a			
Model	Variables Entered	Variables Removed	Method
1	Regulatory factors ^b		Enter

a. Dependent Variable: Mobile Banking Adoption
b. All requested variables entered.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.673 ^a	.452	.451	.864

a. Predictors: (Constant), Regulatory factors

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	235.774	1	235.774	315.635	.000 ^b
	Residual	285.348	382	.747		
	Total	521.122	383			

a. Dependent Variable: Mobile Banking Adoption
b. Predictors: (Constant), Regulatory factors

Coefficients^a					
Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	1.261	.168	7.500	.000
	Regulatory factors	.725	.041	17.766	.000

a. Dependent Variable: Mobile Banking Adoption
a. Dependent Variable: MBA

Source: Survey Data

Table 4.14 above presents a coefficient of correlation (R), Coefficient of determination (R Square), Adjusted R square and standard error of the estimate. The R-value explains what percentage of the model describes the data. In this case, 67.3% of the data can be used to explain the model. R square is used to explain the percentage of the independent variables that can be used to explain the dependent variable. In this case, 45.3% of the regulatory factors explain mobile banking adoption and the rest (100-45.3=54.7%) is

due to unexplained variations. Adjusted R square is an extension of the R square and its used to take care of the number of independent variables in the model. So from the table 4.14, there is only one independent variable, therefore, cannot be used.

Table 4.14 above also presents the overall significance of the model. Analysis of variance (ANOVA) tells us whether the percentage explained by the independent variables is statistically significant. From the table 4.14 above its concluded that the model is statistically significant at 1% significance level (F value = 315.635, p-value = 0.000 < 0.01).

Table 4.14 above looks at the individual independent variables to ascertain there effect in the model and whether they are statistically significant. From the table RF was statistically significant at 1% level of significance (T value = 17.766, p-value = 0.000 < 0.01). Hence from the significant variable, the final model was ;

$$MBA = 1.261 + 0.725 * RF$$

4.6.5 Overall regression model

In this regression model, a combination of the three independent variables was used as the explanatory variables (perceived relative advantage, Social-influence factors, and Regulatory factors) to explain mobile banking adoption. The regression model from Table 4.15 below is given by;

$$MBA = 1.021 + 0.330 * PRAF - 0.122 * SIF + 0.519 * RF$$

Where;

1.021 is the constant term that is when there is no effect of perceived relative advantage, Social-influence factors and Regulatory factors, mobile banking adoption was 1.021

0.330 = Coefficient of perceived relative advantage. For every unit increase in perceived relative advantage, mobile banking adoption is expected to increase by 0.330 holding other factors constant.

-0.122 = Coefficient of Social-influence factors. For every unit increase in Social-influence factors, mobile banking adoption is expected to decrease by 0.122 holding other factors constant.

0.519 = Coefficient of Regulatory factors. For every unit increase in Regulatory factors, mobile banking adoption is expected to increase by 0.519 holding other factors constant. Table 4.15 below presents a summary of the model

Table 4.15 Overall regression model

Variables Entered/Removed^a						
Model	Variables Entered	Variables Removed	Method			
1	RF, SIF, PRAF ^b		Enter			

a. Dependent Variable: Mobile Banking Adoption
b. All requested variables entered.

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.722 ^a	.521	.518	.810

a. Predictors: (Constant), Regulatory factors, Social-influence factors, Perceived relative advantage factors
b. Dependent Variable: Mobile Banking Adoption

ANOVA^a						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	271.746	3	90.582	138.029	.000 ^b
	Residual	249.376	380	.656		
	Total	521.122	383			

a. Dependent Variable: Mobile Banking Adoption
b. Predictors: (Constant), Regulatory factors, Social-influence factors, Perceived relative advantage factors

Coefficients^a							
Model	Unstandardized Coefficients	Std. Error	t	Sig.	Collinearity Statistics		
					B	Tolerance	VIF
1	(Constant)	1.021	.188	5.435	.000		
	PRAF	.330	.050	6.603	.000	.572	1.748
	SIF	-.122	.030	-4.012	.000	.984	1.016
	RF	.519	.050	10.326	.000	.578	1.730

a. Dependent Variable: Mobile Banking Adoption

Source: Survey Data

Table 4.15 above presents a coefficient of correlation (R), Coefficient of determination (R Square), Adjusted R square and standard error of the estimate. The R-value explains what percentage of the model is described by the data. In this case, 72.2% of the data explains the model. R square is used to explain the percentage of the independent variables that can be used to explain the dependent variable. In this case, 52.1% of the perceived relative advantage, Social-influence factors, and Regulatory factors can be used to explain mobile banking adoption, and the rest (100-52.1=47.9%) is due to unexplained variations. Adjusted R square is an extension of the R square and its used to take care of the number of independent variables in the model. So from the table, only 51.8% of the perceived relative advantage, Social-influence factors, and Regulatory factors can be used to explain mobile banking adoption, and the rest is due to unexplained variations.

In the table 4.15 above the overall significance of the model is presented. Analysis of variance (ANOVA) shows whether the percentage explained by the independent variables is statistically significant. It concluded that the model is statistically significant at 1% significance level (F value = 138.029, p-value = 0.000 < 0.01).

Table 4.15 above looks at the individual independent variables to ascertain there effect in the model and whether they are statistically significant. From the table PRAF and RF were statistically significant at 5% level of significance (T value = 6.603, p-value = 0.000 < 0.05) and (T value = 10.326, p-value = 0.021 < 0.05) respectively. SIF was not statistically significant (T value = -4.012, p-value = 0.109 > 0.05). Hence from the significant variables, the final model was ;

$$MBA = 1.021 + 0.330 * PRAF - 0.122 * SIF + 0.519 * RF$$

4.6.6 Summary of the Regression Models

From the four regression, Table 4.16 below presents a summary of the significant and insignificant variables in the models regressed. The first column represents the dependent variable used in the model and the second row represents the independent variables used.

Table 4.16: Summary of Results

Model	Level of Customer Satisfaction			
	PRAF	SIF	RF	Combined
MBA	Significant	Not Significant	Significant	Significant

Source: Survey Data

4.7 Conclusion

This chapter shows data analysis to meet the research objectives, which were to analyze the effect of perceived relative advantage, Social-influence factors and Regulatory factors on mobile banking adoption in Kenya. This was achieved, first through descriptive analysis and secondly, through correlation and regression. Through descriptive statistics, the study examined mean and standard deviation. Through correlation and regression, the study analyzed the relationships that exist between the independent and dependent variables. The results showed that two independent variables that are PRAF and RF had a significant and positive relationship with the dependent variable mobile banking adoption, unlike SI, which was insignificant.



CHAPTER 5

DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.1. Introduction

This chapter presents a summary of discussions and conclusions of research findings, recommendations, and suggestions for future research. It also highlights the major limitations of the study and proposes areas of further research. The overall objective of the research was to understand the factors influencing adoption of mobile banking by commercial customers in Nairobi. Further, this was broken down into three specific objectives as follows: To determine the extent to which perceived relative advantage influences mobile banking adoption among commercial banks' customers. To examine the extent of social influence on mobile banking adoption among commercial banks' customers. To establish the extent to which regulation influences adoption of mobile banking by commercial banks' customers.

5.2. Discussion of the Findings

This section discusses the findings of the study under each study objective.

5.2.1 Perceived Relative Advantage and Mobile Banking Adoption

The results in Pearson's Correlation Analysis shows that PRAF had a statistically significant positive relationship with MBA ($r_s = 0.605$, $p\text{-value} = 0.000 < 0.01$). From the regression analysis, Coefficient of perceived relative advantage factor was 0.644. For every unit increase in perceived relative advantage, mobile banking adoption among commercial bank is expected to increase by 0.644 holding other factors constant. There was a consistent flow where the findings are the same on Regression analysis where The R-value, which explains what percentage of the model describes the data, showed that 60.5% of the data explains the model. R square was 0.366 that means 36.6% of the Perceived relative advantage explains mobile banking adoption and the rest ($100-36.6=63.4\%$) is due to unexplained variations. PRAF was statistically significant at 1% level of significance ($T\text{ value} = 14.841$, $p\text{-value} = 0.000 < 0.01$).

The analysis from the research showed that the respondents agreed with the perceived relative advantage to influencing their decision on mobile banking adoption. The findings of this study are almost consistent with previous studies that had similar findings where the elements of PRA have a significant influence on adoption of mobile

banking (Jahangir & Begum, 2008; Lasserre, 2015; Ravichandran et al., 2016). The study, however, differs with the findings that indicated that Perceived relative advantage did not affect MB adoption (Joubert & Belle, 2013).

5.2.2 Social Influence and Mobile Banking Adoption

The results in Pearson's Correlation Analysis shows that there was a very weak relationship between Mobile banking adoption and social influence factors. The relationship was negative but not statistically significant at 1% significance level ($r_s = -0.069$, $p\text{-value} = 0.176 > 0.01$).

From the regression analysis, Coefficient of social influence factor was 0.59. For every unit increase in social influence factor, it's expected that mobile banking adoption among commercial bank to decrease by 0.59 holding other factors constant. The R-value, in this case, 6.9% of the data can be used to explain the model. R square, in this case, 0.5% of the social influence can be used to explain mobile banking adoption, and the rest ($100-0.5=99.5\%$) is due to unexplained variations. SIF was not statistically significant at 5% level of significance (T value = 1.357, $p\text{-value} = 0.176 > 0.05$). Hence, an insignificant model. This shows that social influence did not influence the customer's decision to adopt mobile banking.

The analysis from the research showed that there was a very weak relationship between Mobile banking adoption and social influence factors. Similarly, Regression Analysis shows that social influence did not influence the customer's decision to adopt mobile banking. The findings disagree with Lasserre (2015) whose findings indicated that social influence strongly influenced respondents decision to adopt mobile banking. The findings of this study are almost consistent with Kasyoki (2012) and Ravichandran et al., (2016) that found social influence had no significant effect on intention to adopt mobile banking, which they explain arguing that mobile banking as a service is rather personal and sensitive, so the need for privacy and security supersede any social influence.

5.2.3 Regulation and Mobile Banking Adoption

There was a strong relationship between regulation and mobile banking adoption with an overall mean was 3.77 with a standard deviation of 1.13, indicating that the respondents agree with regulation as a measure of mobile banking adoption. The results in Pearson's Correlation Analysis shows that there RF had a statistically significant positive relationship with and ($r_s = 0.673$, $p\text{-value} = 0.000 < 0.01$) respectively.

From the regression analysis, Coefficient of regulatory factors was 0.725. For every unit increase in regulatory factor, mobile banking adoption among commercial bank customers is expected to increase by 0.725 holding other factors constant. The R-value, In this case, shows that 67.3% of the data can be used to explain the model. R square shows 45.3% of the regulatory factors can be used to explain mobile banking adoption, and the rest ($100-45.3=54.7\%$) is due to unexplained variations.

There was a strong relationship between regulation and mobile banking adoption from both the results in Pearson's Correlation and Regression Analysis. These findings agree with previous studies where mobile banking adoption was significantly influenced by regulation (Duncombe & Boateng, 2017; Mwega, 2014; Nyaga, 2017). The study differs with the findings that claimed that regulation did not have any impact since there was minimal interoperability (Andiva, 2015; Makin, 2010; Mwaura, 2009).

5.2.4 Adoption of Mobile Banking

From the analysis, the research established that although 95 % of the respondents had mobile banking as of March 2018, 69.6% of the 95.3% respondents that had mobile banking had been using it for more than 1 year while 30.5% had been using mobile banking for less than 1 year. 44.0% of the respondents were accessing mobile banking using the app. This shows that the app has overtaken other models of accessing mobile banking compared to earlier studies that showed the Mpesa platform as the dominant one (Sachombe, 2017). 14.1 % of respondents accessed MB using mobile banking sim card, 27.2% through the Mpesa platform, registration from the bank was 13.3 % while other platforms were 1.9%. 30.5% of the respondents had adopted MB within the last one-year indicating relatively faster intake of the innovation.

From the overall regression analysis model, 1.021 is the constant term, thus when there is no effect of perceived relative advantage, Social-influence factors and Regulatory

factors, mobile banking adoption was 1.021. The coefficient of perceived relative advantage was 0.330. For every unit increase in perceived relative advantage, it's expected that mobile banking adoption increases by 0.330 holding other factors constant. The coefficient of Social-influence factors was -0.122. For every unit increase in Social-influence factors, mobile banking adoption is expected to decrease by 0.122 holding other factors constant. The coefficient of Regulatory factors was 0.519. For every unit increase in Regulatory factors, it's expected that mobile banking adoption increases by 0.519 holding other factors constant.

The R-value explains what percentage of the model describes the data. In this case, 72.2% of the data explains the model. R square explains the percentage of the independent variables that explain the dependent variable. In this case, 52.1% of the perceived relative advantage, Social-influence factors, and Regulatory factors are used to explain mobile banking adoption, and the rest (100-52.1=47.9%) is due to unexplained variations. Adjusted R square is an extension of the R square, and it is used to take care of the number of independent variables in the model. Therefore, from the table, only 51.8% of the perceived relative advantage, Social-influence factors, and Regulatory factors explain mobile banking adoption and the rest is due to unexplained variations.

5.3 Conclusions

The study set out to find out factors influencing customer adoption of mobile banking. 62.2% of the respondents were male indicating that there were more male commercial bank customers than the female. 81% of the respondents were under the age of 40, which confirms the diffusion of innovation theory that younger people tend to adopt innovation earlier than older people do. 59.1 % of the respondents had a degree or higher indicating that the learned people were more receptive to innovation. Mobile banking app usage took the lead with 44% of respondents using, and the Mpesa platform was second with 27.1%.

The analysis from the research showed that the respondents agreed with the perceived relative advantage to influencing their decision on mobile banking adoption. It is important to note that PRA are components of TAM and have affect mobile banking adoption significantly. There was a very weak relationship between Mobile banking adoption and social influence factors thus concluding that social influence did not

influence the customer's decision to adopt mobile banking. There was a strong relationship between regulation and mobile banking adoption from both the results in Pearson's Correlation and Regression Analysis.

5.4 Recommendations

Since most of the respondents possess the knowledge of how to use mobile banking services, banks should strive to educate the account holders on the benefits that they would incur from taking up the services. The bank also needs to offer the best services to the current users to encourage those not using to use it.

There is a need for continuous awareness and information provision on how the Mobile Banking innovation works. Banks should continuously educate their customers on the availability of the innovation as well as measures that may already be in place to mitigate risk associated with the use of the innovation.

5.4 Limitations of the Study

One of the drawbacks of the research was the speed of data collection because of the pressure of financial resources and time. It was impossible to conduct personal interviews by the researcher of all the respondents, thus, respondents were asked to fill questionnaires. The weakness of this approach was that some respondents who were not on the mobile banking platform or not using it did not complete the questionnaires.

There is also the possibility that some of the people using mobile banking are so much into it that they rarely visit bank halls and therefore they may not have been included in the study. There was no way of knowing who such persons could be. This study was carried out in Nairobi County. Therefore, other parts of the country had been left out. The study also focused on three variables that are PRAF, SI, and RF that influenced adoption of mobile banking adoption; therefore, many variables that influence MB were left out of the study.

5.5 Suggestion's for Future Research

This study looked at the factors influencing adoption of mobile banking in commercial banks and focused on Nairobi County. The study recommends that similar studies be carried out in other counties to be able to compare the findings and make generalized conclusions. In addition, the variables in this study explained only 52.1% of the variance in the adoption of mobile banking, which suggests that there factors explaining the rest of the variance. There is a need for futher research establishing the other factors influencing the adoption of mobile banking using different models that could explain the variance in

the adoption of mobile banking by bank customers in Kenya. Banks should become more proactive in supporting researchers in this field. Further to this, the methods used in the field collection of data should allow closer probing of responses from respondents to get best results.



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APPENDICES

APPENDIX I: INTRODUCTION LETTER

Title of Research: Factors Influencing Adoption of Mobile Banking in Kenya

To whom it may concern,

I am currently enrolled in the Masters of Commerce Program at Strathmore University School of Management and Commerce, and I am conducting this research in partial fulfillment of the requirement of the MCOM Degree.

Please find attached herein a questionnaire that has been designed to collect information mainly on three subtitles; section A contains questions of a general type, and Section B and C contains questions relating to factors affecting adoption of mobile banking.

This study will yield important findings for decision making for banking and mobile money institutions as it seeks to find the factors influencing mobile banking adoption.

Your participation in this research project is voluntary. There are no known risks to participation beyond those encountered in everyday life. I promise to ensure confidentiality of your responses by making no specific reference to your feedback and not to cause any harm to you throughout this process. A full report of this study can be made available to you at your request. I look forward to your participation.

Thank you.



Mildred Wangari Kiogotho.

APPENDIX II: QUESTIONNAIRE

The study aims to examine factors that influence adoption of mobile banking in Kenya:
A case of Nairobi County.

SECTION A

General information

Please tick the box that best suits you.

1. Name (Optional)
2. Please tick:
 Male Female
3. Please indicate the range of your Age:
 18 – 30 Years 51 – 60 Years
 31 – 40 Years 61 and Above Years
 41 - 50 Years
4. Which of the following best describes the level of your education?
 Below Diploma Master's Degree
 Diploma Doctorate Degree
 Bachelor's Degree
5. Which of the following best describes the level of your monthly net Income?
 Ksh. 50,000 and Below
 Ksh. 50,001 – Ksh. 100,000
 Ksh. 100,001 – Ksh. 300,000
 Ksh. 300,001 – Ksh. 800,000
 Above Ksh. 800,000
6. Do you have Mobile Banking?
 Yes
 No
7. Under which platform do you access your mobile banking?

- Mobile banking app
- Mobile banking sim card
- Mpesa platform
- Through registration from my bank
- Others specify...

8. For how long have you used mobile banking?

- Less than 6 months
- 6 months - 1 Year
- 1 – 2 Years
- 2 - 3 Years
- Above 3 Years



SECTION B: FACTORS INFLUENCING ADOPTION OF MOBILE BANKING

The below table has a set of questions that you may tick appropriately as it may apply to you.

- Answer ALL questions
- The numbers 1 to 5 represent the below rating
 1 - Strongly disagree 2 - disagree 3 - somewhat agree 4 – agree 5- strongly agree

Rating	1	2	3	4	5
Perceived relative advantage factors					
Is mobile banking service reliable					
Using mobile money would increase my efficiency					
I find mobile banking useful for my banking needs.					
Using mobile banking would help me pay more quickly					
Cost of use influences my choice of mobile banking					
Using mobile money does not require a lot of mental effort					
Mobile money seems easy to use					
I would not feel totally safe providing personal privacy information over the mobile money system					
I value trust more in deciding to use mobile banking technology than the technology itself					
The login and sign off are easy					

There is security in the transactions carried out					
Social-influence factors					
People I regard as important approve my use of mobile banking					
My social standing will diminish if I don't adopt mobile banking					
I use Mobile Banking since its fashionable to use it					
I use mobile banking since my peers use it					
My peers have adopted mobile banking because I use it					
I send money to my peers using mobile banking					
Regulatory factors					
I am aware of the regulatory changes in Mobile Banking that allow interconnection of mobile money services between providers?					
There is a level playing field amongst mobile banking operators giving me alternative channels					
I can now comfortably send money across banks and mobile money operators					
I can now tell how much a transaction on mobile banking costs					
Mobile banking Regulation has reduced cases of fraud					
My knowledge of the cost of transaction will influence my decision to use mobile banking.					

Mobile banking Regulation has led to increased convenience					
Mobile banking regulation has led to increased choices					
Mobile Banking Adoption					
I am interested in learning more about Mobile Banking Services					
I frequently use mobile banking services					
I am aware of the latest developments and changes in mobile banking					
I have used mobile banking in the last month					

