

**HOUSEHOLD CHOICE OF MOBILE MONEY TRANSFER SERVICE  
PROVIDERS: CASE OF NAIROBI COUNTY, KENYA.**

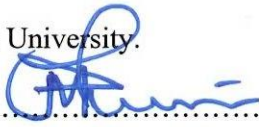
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**RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF  
ECONOMIC THEORY IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF  
MASTERS IN ECONOMICS (POLICY AND MANAGEMENT)  
OF KENYATTA UNIVERSITY.**

**NOVEMBER, 2018.**

## DECLARATION

This project is my original work and has not been presented for the award of a degree in any other University.

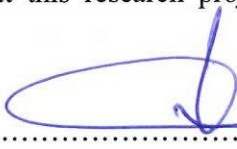
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## **DEDICATION**

This work is dedicated to my beloved late mother Elizabeth Wambui, my Father Mr. Joseph Muigai Mwangi, my guardian Mr. and Mrs. Martin Mugo and my Aunt Hannah Muthoni Njuguna.

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## LIST OF ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
ATM	Automated Teller Machine
CAK	Communications Authority of Kenya
CBK	Central Bank of Kenya
CCK	Communications Commission of Kenya
DIT	Diffusion Innovation theory
GCASH	Global Cash
GDP	Gross Domestic Product
GSM	Global System for Mobile Communications
GSMA	<i>Groupe Spéciale</i> Mobile Association.
ICT	Information Communication Technology
MMTS	Mobile Money Transfer Services
MMTS	Mobile Money Transfer Services
MNO	Mobile Network Operator
M-PESA	Mobile-Pesa
P2B	Person to Business
P2P	Person to Person
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
RUM	Random Utility Model
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	The Unified Theory of Acceptance and use of Technology

## **OPERATIONAL DEFINITION OF TERMS**

*Mobile Money Transfer Service Providers:* are licensed telecommunication companies providing the necessary mobile network and appropriate infrastructure required to transfer money via mobile phones.

*Mobile Money Transfer services:* It refers to financial services and transactions made on a mobile phone tied to a mobile network operator. These services may or may not be tied directly to a personal bank account.

*Mobile Network Operators:* are licensed telephone companies that provide telecommunications services. They may or may not have their own network infrastructure and they may have MMTS or not.

*Mobile transactions:* refer to transactions carried out through mobile technologies and devices. In addition to mobile payments, it includes every kind of mobile transaction offered by technology, whether it involves financial values or not.

*Mobile phone penetration:* is often used to mean the number of active mobile phone users per 100 people within a specific population, which is technically not a penetration rate as it does not account for users having multiple mobile phones and hence can exceed 100 percent due to double counting.

## ABSTRACT

The adoption and use of mobile money have become widespread particularly among the poor and the unbanked society. Besides reducing the costs of communication and improving access to information, mobile phones are an enabling technology for other innovations. One important example is mobile money transfers services, which could be very relevant for the rural poor, who are often under-served by the formal banking system. As a valued addition service (VAS), Mobile Money Transfer Services (MMTS) has proven to be a critical component in poverty reduction in Africa in general and Kenya in particular. Access to basic financial services through mobile money could enhance the ability of rural households to invest in their livelihoods and improve welfare. Kenya is a home to six service providers of mobile money making her a global leader in usage of mobile money transfer services. Various researches conducted in Kenya reveal that despite leading in usage of mobile money, users are faced with myriad of challenges such as prohibitive costs on small transactions, network outages and users are not able to switch easily from one dominant service provider to others. The main objective of the study was to assess mobile money transfer services market in Kenya using a case study of Nairobi County. To achieve this objective, the study adopted non-experimental research design since the information required could not be manipulated. The study made use of both the secondary and primary data. Primary data was obtained through structured questionnaires from 209 respondents. The data obtained was analyzed using both logistic and multinomial logit regression models to achieve objective one and two respectively. The study issued a total of 250 questionnaires and a total of 209 were successfully and adequately filled and returned which translates to 83.6 percent. The results of the study indicated that M-pesa is the most popular MMTS followed by Airtel money, Equitel money, Orange money, Mobi-kash and Yu cash. Expressed as percentages, the awareness of MMTS translates to 97.1, 59.1 52.9 33.7, 17.3 and 7.7 respectively. The results on the marginal effect indicated that the variables Age, Education level, income, cost of transaction of MMTS and cost of transaction of alternatives to MMTS were significant at 5 percent level. However, Gender, ease of accessibility, convenience and number of mobile phones were not significant at 5 percent level of significance. Multinomial Logit regression marginal effect model for the factors that influence the choice of mobile money transfer service (MMTS) providers in Nairobi County indicated that ease of access, cost of transaction and convenience was significant in all the three models estimated representing the three service providers with one dominant service provider being the reference category. Variables Age, number of mobile phones and gender were not significant all along in determining the choice of MMTS service provider across the different service providers. Based on key findings, this study recommends increase in the number of money agents outlets by each service provider with smaller market shares to ease access, aggressive advertising to raise awareness of the existence of specific mobile money service providers and to take high consideration before making any transaction costs reviews as households were found to be highly responsive to transaction costs.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1. 1 Background**

In the developing world telecommunication sector has developed widely. Such development includes Mobile Money Transfer Service (MMTS) and transfer of money utilizing Information and Communications Technology (ICT) framework and Mobile Network Operators (MNO). Mobile Network Operators foundation acts as a channel to transfer finances between clients of one or different MNOs to both the cell terminals or to business association to pay for or buy merchandise and enterprises. Money transfer between mobile phones takes different structures, for example, individual to individual and individual to business/bank. According to Kihara (2015) these definitions may not be as intensive but rather as demonstrative because of the dynamism of MMTS.

#### **1.1.1 Mobile Phones Penetration**

According to Jack & Suri, (2011); Mbiti & Weil, (2011) of all the different innovations created in the 21<sup>st</sup> century, the selection of cell phones advances has been referred to as the most quickly diffused of consumer based innovation ever. In the year 2015 International Telecommunication Union (ITU) found that there were more than 7 billion mobile cell memberships. According to ITU (2015a) the worldwide penetration remained at 128 percent and 89 percent in developed nations and developing countries respectively. This exponential development over the most recent two decades is owing to the formation of code division multiple access (CDMA) and global system for mobile communication (GSM), which is the significant frameworks utilized as a part of cell phones.

Cell phone infiltration has altered the world's information and innovation sector (Ondiege, 2010). As indicated by ITU (2008) statistics, cell phone appropriation has the most astounding infiltration rate on the planet and then internet. For instance, in the period of 1998 and 2009, the utilization of the cell phone in China expanded from 1.92 per 100 individuals to 55.9 for every 100 individuals. In India, it ascended from 0.12 for every 100 to 44.7 for every 100 individuals (Nyaga, 2015). Africa likewise saw an expansion in cell phone infiltration from 0.53 for each 100 individuals in 2003 to 42.82 for each 100 individuals in 2009 (AfDB, 2010).

Table 1.1 shows cell phone penetration in chosen 16 African nations. The nations have the most astounding cell phone infiltration in Africa from the year 2000 to 2014.

**Table 1.1: Mobile-cellular Telephone Penetration selected African countries. (2000-2014).**

Country/Year	Mobile-Cellular telephone subscriptions(000s-millions)		% Change ('00-'14)	% Average Annual growth	Mobile-telephone cellular subscriptions per 100 inhabitants	
	2000	2014			2000	2014
Algeria	0.09	37.11	43,054.80	2,870.32	0.27	108.44
Angola	0.03	14.05	54,354.62	3,623.64	0.19	63.48
Botswana	0.22	3.41	1,434.95	95.66	12.66	167.30
Cameroon	0.1	17.27	16,622.00	1,108.13	0.65	75.69
Chad	0.01	5.25	95,382.91	6,358.86	0.07	39.75
Egypt	1.36	95.32	6,909.05	460.60	2.06	114.31
Kenya	0.13	33.63	26,298.41	1,753.23	0.41	80.68
Mali	0.01	23.51	225,958.46	15,063.90	0.10	149.07
Morocco	2.34	44.11	1,783.63	118.91	8.16	131.71
Mozambique	0.05	18.48	36,094.34	2,406.29	0.28	69.82
Nigeria	0.03	138.96	463,101.07	30,873.40	0.02	77.84
Rwanda	0.04	7.75	19,764.15	1,317.61	0.46	64.02
South Africa	8.34	79.28	850.72	56.71	18.59	149.19
Sudan	0.02	27.8	120,754.83	8,050.32	0.07	72.2
Tanzania	0.11	31.86	28,730.29	1,915.35	0.32	62.77
Uganda	0.13	20.37	15,947.17	1,063.14	0.52	52.43

Source of Data: International Telecommunication Union, World Telecommunication Indicators (2014).

Numerous African nations encountered an expansion in cell phone infiltration between 2003 and 2014 as shown in table 1.1. Cell phone entrance has been viewed as practically equivalent to possession of cell phone. This is true because according to Asongu (2015) purchasers request the phones and after that possess them therefore expanding entrance. Accordingly, the two terms will be utilized interchangeably in this research. The 16 nations in table 1.1 represent four noteworthy areas with fast cell phone selection in Africa. Uganda and Kenya which represents the East Africa experienced mobile telephone possession expanding by an annual average of 1,063.14 percent and 1,753.23 percent respectively from year 2000 to 2014. Algeria and Egypt

which represent Northern part of Africa encountered an annual average of cell phone infiltration of 2,870.32 percent and 460.60 percent respectively in the same year. West African nations encountered the most elevated yearly cell phone adoption. In Chad, cell phone proprietorship expanded by 95,383 percent to 5,251,560 in 2014 from 0.07 in the year 2000 to 39.75 for each 100 occupants, in Nigeria, there was an expansion in cell phone infiltration to 138,960,320 in 2014 from 30,000 in the year 2000 representing an annual average growth of an incredible 30,873.40 percent. In other countries such as Angola experienced an expansion of cell phone infiltration from 25,800 in 2000 to about 14,000,000 in year 2014 representing an annual growth rate of 3,623.64 percent. South Africa and Botswana recorded an average annual growth rate of 56.71 percent and 95.66 percent respectively in cell phone infiltration in the period under review.

### **1.1.2 The Spread of Mobile Money Transfer Services.**

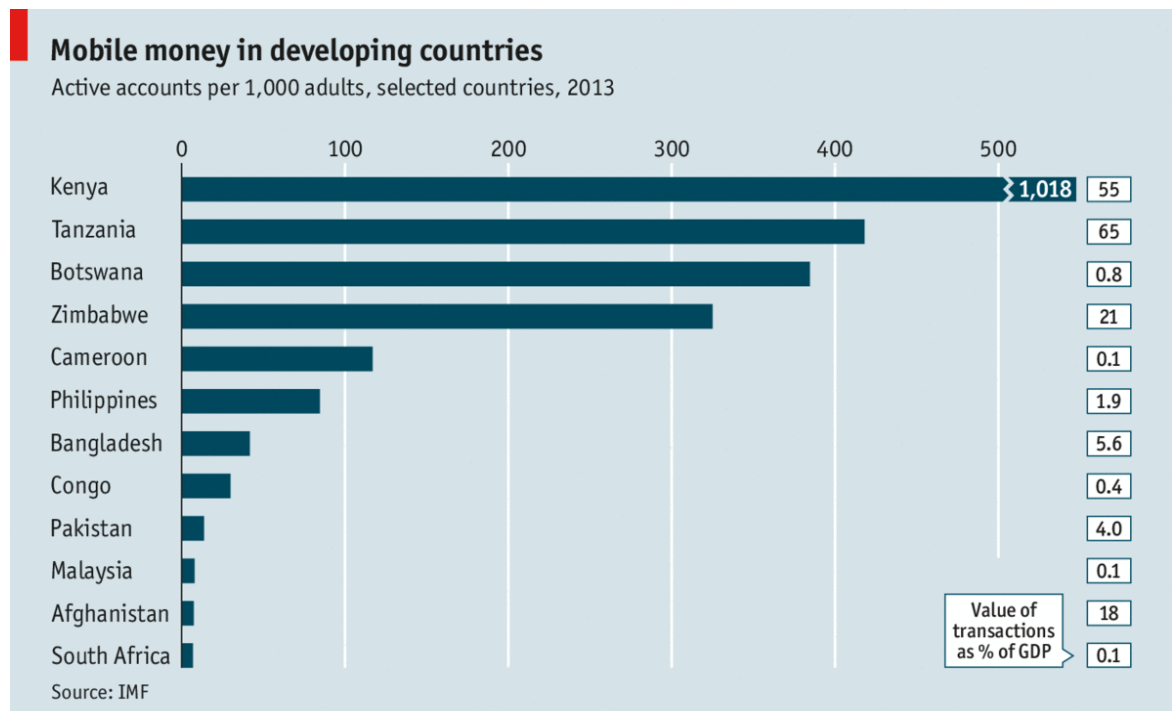
According to Tobbin (2013) Philippines were the pioneers of Mobile Money Transfer Services which started after the dispatch of SMART money. According to Suri, (2010) its effective usage happened in Kenya when M-Pesa was launched by Safaricom in March 2007. According to Fin Access (2009) M-pesa had picked up 9 million clients in three years which represents 40 percent of grown-up populace in Kenya (Ignacio Mas and Dan Radcliffe, 2010) and handled a greater number of exchanges locally than Western Union.

According to CAK (2013) Mobile money transfer Services in Kenya kept on growing at a rate of 73 percent. This development in Mobile Money Transfer Services ensures people a productive strategy for executing financial transactions, as it gives



reasonable budgetary administrations to the previously excluded population (Collins, 2009). The systems of mobile payments are additionally being created in a few other developing nations a greater part of them being in Africa. GSMA (2013) argued that there are a total of 218 mobile money systems in eighty-four nations half of them being in Sub-Saharan Africa, for example Globe Telecom works GCASH in the Philippines and WIZZIT in South Africa. Also Sudan, Tanzania, Uganda, Rwanda, Ghana and Zimbabwe and in a few different nations found in Middle East and Latin America have adopted mobile money services.

Figure 1.1 below shows Trends in mobile money in 12 selected developing countries.



**Figure 1.1 Trend in mobile money in 12 selected developing countries**

Kenya is a worldwide pioneer as far as mobile money adoption is concerned (Morawczynski and Pickens, 2009). Kenya has more dynamic accounts in the mobile payments than grown up population (IMF, 2013). Around the same year of study, cell phones carried out transaction worth \$24 billion which represented 50 percent of the

nation's GDP (Marumbwa, 2014). As cell phones turn out to be all the more broadly accessible, cell cash exchanges have helped reach the "unbanked". In no less than eight African nations, including Zimbabwe and Congo, there have been more enrollments of the versatile cash accounts contrasted with conventional financial institutions accounts (Marumbwa & Mutiskiwa, 2013). Figure 1.1 above shows that exponential development of MMTS is experienced in both developed and developing nations particularly the Asian nations and Latin American. In Philippines the measure of exchange through Mobile Money Transfer Services is equal to 1.9 percent of the aggregate GDP.

According to Asongu (2015) this exponential development of mobile money services in numerous nations is ascribed to numerous essential factors one of the factors being favorable regulatory policies set up by the particular governments. These policies are adapted to advance money related incorporation and reach the 'unbanked' in the general public. Asongu (2015) argued that the positive strategies in the Telecommunications businesses in numerous African nations have brought about rivalry among MNOs offering the services. Further, availability of the cell phones and also the ability to access them has increased the use of mobile money services. According to Nyaga (2015) cell phones companies have been in rivalry to catch new clients particularly in rural zones and the growing middle class in both developed and developing nations.

### **1.1.3 Situational Analysis of Kenyan Mobile Money Market**

In Kenya M-pesa which belongs to Safaricom has dominated the mobile money market. This predominance can be credited to the way that Safaricom was the principal MNO to dispatch Mobile Money Transfer Services in 2007 USAID, (2011)

and delighted in a monopoly business model for more than 3 years before different MNOs propelled their Mobile Money Transfer Services. It is in this way not astonishing that despite establishment of five more service providers, it commands the money market currently enjoying 67.4 percent of the mobile money services. In the subsequent years other providers of mobile money services sprung up thus Safaricom share reduced from 82.37 percent in 2011 to 67.4 percent as the end of 2016 as shown in table 1.2. These other mobile money providers included Tangaza money, Yu Cash which was launched by Essar, Orange money launched by Telkom Kenya, Airtel money which is owned by Airtel and finally Finserve Africa launched Equitel in July 2015. Equitel money entered the market with similar products and offered them at extremely lower costs than other old providers and as a result in a period of one year it had acquired 3.88 percent mobile money market share.

Table 1.2 below shows a situational analysis of Mobile Money Transfer Service providers in Kenya.

**Table 1.2 Mobile Money Transfer Service providers in Kenya.**

Service Providers	Launch Date	As at November 2011		As at December 2016	
		No. of Subscribers	Market Share (%)	Mobile Money Subscribers	Mobile Money Market Share (%)
Safaricom (M-Pesa)	March 2007	15,381,309	82.37	21,574,006	67.43
Airtel (Airtel Money)	November 2010 (as ZAP Zain) re-launched in 2011	2,950,000.	15.80	6,711,829	20.97
Orange(Orange Money)	November, 2010	141,000	0.67	194,322	0.61
Finserve (Equitel Money)	July, 2015	-	-	1,240,503	3.88
MobiKash*	July 2011	89,900	0.48	1,772,696	5.54
Tangaza*	January 2011	110,800	0.58	503,556	1.57
<b>TOTAL</b>		<b>18,673,009</b>	<b>100.00</b>	<b>31,996,912</b>	<b>100.00</b>

*Source:* Communications Authority of Kenya, CA,

Table 1.3 shows that in Kenya mobile money services have grown exponentially. The result in the table shows that the subscription grew 18,673,009 to 31,996,912 between 2011 and December 2016 which represents a remarkable growth rate of 58 percent hence much money was transacted via cell phones. Between first of October and end of December the same year the volume of mobile money exchange was Kshs. 456,600,000. According to KNBS (2017) Kshs 1,100 Billion was exchanged among mobile money clients in the year 2016. This represented 67.81 percent of the aggregate government spending and 50 percent of the nation's GDP. Along these lines, this can clarify why Mobile cash exchange administrations has pulled in and invigorated consideration of various scientists due to the excellent and unparalleled development contrasted with other alternate innovations in the 21st century and revolutionizing the money markets and thus influencing households positively (Mas and Ignacio, 2009). Table 1.2 also reveals that Kenya has 6 mobile money transfer service providers which is 12 percent of the considerable number of providers in sub-Saharan Africa. According to GSMA (2013) 50 percent of the considerable number of mobile money service providers is found in Sub-Saharan Africa.

#### **1.1.4 Service Providers' Transaction Costs.**

Accessible information from the provider's website demonstrates that the exchange costs varies from one provider to the other relying upon different factors, for example, the value sent or received, regardless of whether one is registered to a particular provider or not and additionally cross-service provider exchange charge. On one hand Safaricom M-pesa least cost of sending and withdrawing cash varies from Ksh 11-Kshs 110 and Kshs 50-Kshs 330 for values of Kshs 101-Kshs 70,000 and Kshs 50-Kshs 70,000 respectively. On the other hand, it is free to transfer money by means of

Airtel cash while withdrawal charges differ from Kshs 10-Kshs 330 for measure of Kshs 50-Kshs 70,000. So also, a similar pattern of different expenses is displayed by other providers as shown in Appendix IV.

## **1.2 Problem Statement.**

The rapid adoption of cell phones has produced a lot of confidence with respect to its impact on economic improvement in Africa. Policymakers, daily papers and cell phone organizations have all touted the capability of cell phones to eradicate poverty (Corbett, 2008). All things considered, mobile innovation has kept on reforming banking and payment frameworks in Kenya, with arrangement of utilizations that empowers assorted mobile money transfer services (MMTS). These applications incorporate buying airtime, transferring money, ATM withdrawals, paying bills and facilitating transactions like withdrawing and sending money across different bank accounts using mobile phones.

Collins (2009) observes that in Kenya MMTS has been on an upward trend and currently has 6 service providers making her global leader in mobile money transfer services. The growth in MMTS has benefited households by giving them variety of choice, further increase in the number of MMTS has led to improvement in financial inclusivity especially to rural households thereby reducing poverty and improving livelihoods (Asongu, 2015). However, despite cited benefits of utilizing mobile money transfer services, households are still faced with myriad of challenges such as such as prohibitive fees for small transactions Comminos, Esselaar and Ndiwalana, (2008) and network outages and delays Sadana et al., (2011). This is a drawback to households and government which has set various regulatory frameworks Asongu

(2015) to benefit the households utilizing Mobile money transfer services whichever service provider they choose.

According to Jack and Suri (2011) mobile money is convenient, more secure, less expensive and quicker than casual means henceforth the remarkable development in the utilization of mobile payments. The exchange cost, usability, advantageous, safety, convenience among different elements are thought to hypothetically explain why individuals choose different service providers. However, their effect on the choice of service provider by households has not been empirically established. This research endeavored to connect the previously mentioned gaps by pinpointing which challenges and variables impact household decision of MMTS providers and evaluated the consciousness of different MMTS providers accessible to households in the County of Nairobi.

### **1.3 Research Questions**

The research questions for the study were:

- i. What is the household choice of mobile Money Transfer Service over alternatives of mobile money transfer in Nairobi County?
- ii. What are the factors that influence the choice of MMTS providers in Nairobi County?

### **1.4 Research Objectives.**

The objective of the study was to analyze household's choices of mobile money transfer services in Nairobi County.

The specific objectives were:

- i. To investigate the household choice of Mobile Money Transfer Service over

alternatives of mobile money transfer in Nairobi County.

- ii. To determine the factors that influence the choice of Mobile Money Transfer Service providers in Nairobi County.

### **1.5 Scope of the Study**

The research was completed in Nairobi County attributable to the way that there is a good statistic portrayal and reflection of the various social-economic profiles in the county. Nairobi County is additionally endowed with rich scope of mobile network operators (MNOs) signals. The study was done using primary data from 209 individuals.

### **1.6 Significance of the Study.**

This study benefits both the organizations that offer mobile money transfer services and the individuals using the same services. Relevant authorities responsible for analyzing the dominance of market like Competition Authority and Communications Authority of Kenya also stands to be a beneficiary of the findings presented in this study.

### **1.7 Organization of the Study**

This project is arranged out in five chapters. The background information related to the study is explained in chapter one. The relevant literatures are presented in the second chapter. Chapter three portrays the methodology that was embraced in the study. It explains the theoretical framework adopted, specifies the model, explains the sources of data and also the methods of data analysis. The results of the research are presented in the fourth chapter while the summary of the findings, policy implications and the conclusion are presented in chapter five.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter reviews the relevant literatures to the study. It comprises of theoretical and empirical literature review, and also gives an overview of the same. On one hand, Theoretical literature basically isolates the relevant theories explaining mobile money transfer service technology adoption. It also extends to theories explain various variables that are considered to be the determinants of mobile money technology adoption. On the other hand, empirical literature focuses on the researches that have been done on the same subject.

#### **2.2 Theoretical Literature Review**

##### **2.2.1 The Theory of Technology Acceptance Model (TAM)**

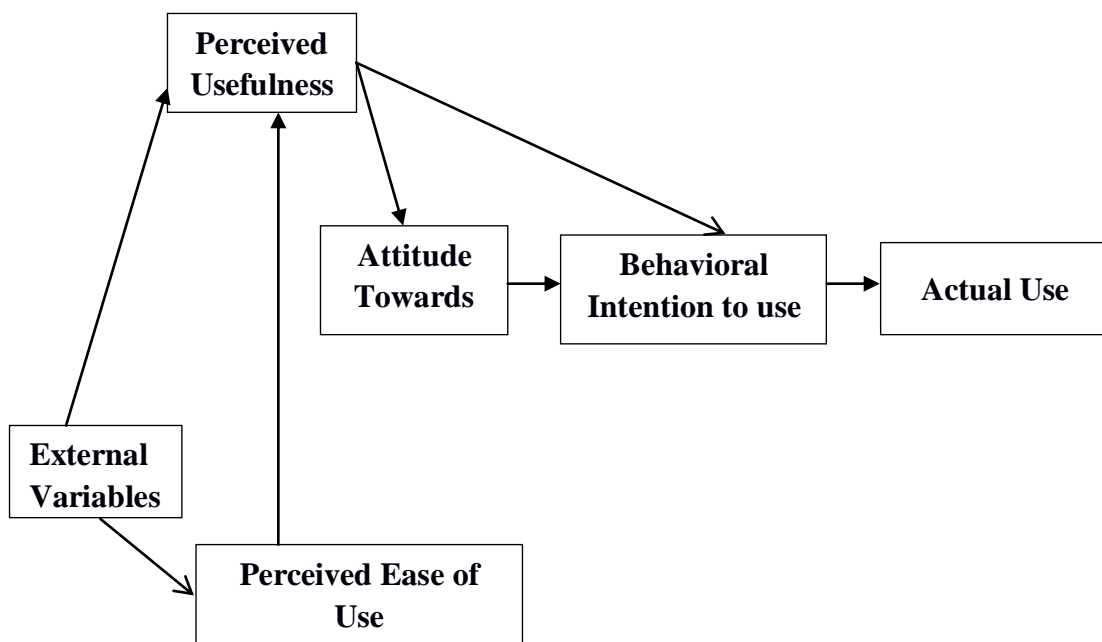
TAM which was initially proposed by Davis (1986) identifies with innovation acknowledgment and utilize. TAM incorporates two intellectual convictions that is apparent usefulness and perceived ease of use. Perceived Usefulness (PU) is characterized by how much a person trusts that utilizing a specific framework would improve his or her activity execution. PU in the adoption of mobile money services is characterized in a more extensive idea to incorporate how well customers trust mobile money services can be integrated into their day by day activities Kleijnen et al., (2003). The other factor is perceived ease of use (PEOU) characterized as how much a person utilizing a specific system will be free of mental and physical exertion. Marumbwa and Mutsikiwa (2013) argued that MMTS identifies with the convenience of the transaction procedures, enrollment systems and how easily can individuals



access the agents offering mobile money services. TAM has turned out to be a hypothetical model in clarifying and anticipate user conduct of information innovation (Legris, Ingham, and Collette, 2003).

TAM is viewed as a compelling augmentation of the theory of reasoned action (TRA), Ajzen and Fishbein (1980). Davis, Bagozzi, and Warshaw (1989) proposed TAM to clarify why a user acknowledges or rejects information innovation by utilizing TRA. TAM gives a premise with which one follows how external variables impact conviction, state of mind, and intention to utilize.

Figure 2.1 elaborates the original TAM.



**Figure 2.1 Original TAM**

According to Nanjala (2015) two variables are thought to be the essential determinants for embracing and utilizing new innovation. These variables are perceived usefulness and perceived ease of use. According to Lu, Yu, Liu, and Yao, (2003) these two factors are likewise affected by other factors such as price tag or

cost, convenience, safety and satisfaction. Perceived ease of use specifically influences apparent convenience and the two variables decide the user's state of mind towards the adoption of the new innovation. According to Mukoma (2015) TAM has been utilized as a reasonable instrument to recognize issues rotating around ICT's appropriation. TAM has been adopted by many researchers when analyzing household's decision to adopt MMTS technology (Amberg, 2004), Pagani, (2004), Teo and Pok, (2003), Marumbwa and Mutsikiwa, (2013), Nanjala, (2015).

Different analysts contemplating the adoption of mobile money technology have broadened TAM by including other outside factors while estimating the determinants of innovation reception. These factors incorporate gender and earlier use Venkatesh and Morris, (2000), experience, education and age Pijpers et al., (2001). A research by Nanjala (2015) used the TAM model but with alterations and reached out to cover different components accepted to be basic in influencing MMTS adoption.

The main weakness of this model was the exclusion of gender as a variable in the model. Gefen and Straub (1997) argued that females and males perceive usefulness of information framework differently and therefore gender was supposed to be included in the model. According to Minton and Schneider, (1980) men have a tendency to be exceedingly task oriented and hence, execution anticipations, which center on undertaking achievement, are probably going to be particularly remarkable to men. As per Morrow, Presll and McElroy (2001) ladies ordinarily encounter high levels of tension in utilizing a given innovation which could prompt lower level of perceived ease of use. Gefen and Straub (1997) contend that men have relative inclination to feel calmer with automated gadgets when contrasted with ladies.

However, studies in Kenya are yet to find out the centrality of gender in the adoption of mobile money transfer services technology in Kenya

Age was intermittently found to influence performance expectancy (usefulness), effort expectancy (convenience), social impact, and as an encouraging condition in numerous TAM-related examinations. Morris and Venkatesh (2000) found an immediate impact of age on usefulness perception for both long-term and short-term usage. According to Venkatesh (2003) age impact was more in older laborers in terms of weaker readiness to adopt new information technology items. Morris, Venkatesh, and Ackerman (2005) utilized Hypothesis of Planned Behavior to look at age as a mediator of the determinants of innovation use. They discovered older workers impacted more by a state of mind toward utilizing technology, subjective standard (social impact), and perceived behavioral control (encouraging conditions).

Also, other recent investigations by Kikulwe et al., (2014) that concentrated on the adoption of mobile money technology are consistent with prior discoveries on technology appropriation utilizing TAM model, where age of the family unit was found to assume a less critical part in MMTS use by family's heads. However, as far as cell phone proprietorship which is a typical medium of executing mobile money transfer, age was found to assume a noteworthy part (Wesolowski et al., 2012).

Another major restriction of TAM model is the absence of clear clarifications for the motivations as to why an individual perceives that a given system is helpful. To deal with these limitations Venkatesh and Davis (2000) proposed a change of TAM. According to Venkatesh and Davis (2000) the new model was supposed to incorporate extra factors as precursors to the perceived usefulness.

### **2.2.2 Modified Technology Acceptance Model (TAM 2)**

TAM2 stretched out the first model to clarify perceived usefulness and use expectations including social impact (subjective standard, intentionality, and image), intellectual instrumental procedures (work significance, yield quality, and result obviousness) and experience. The new model was tried in both willful and compulsory settings. The outcomes emphatically upheld TAM2 (Venkatesh and Davis, 2000). Like TAM 1, TAM 2 place individual (convenience, usefulness) and authoritative (e.g. social standards, encouraging conditions) precursors to foresee conduct goal to utilize (i.e., acknowledgment) and additionally real utilization of new innovation in an association. The model recommends that usefulness and convenience are vital factors in deciding client mentality towards embracing another innovation (Malhotra & Galletta, 1999). The model has in fact been utilized as a part of various investigations on adoption of mobile services, which focuses on users (Amberg, 2004, Pagani, 2004, Samtani et al., 2003). The constructs of the model are really intended to be general and widespread.

As proposed in TAM2, subjective standard, one of the social impact factors, alludes to the apparent social strain to perform or not to perform the behaviour (Ajzen, 1991). It appears to be critical to decide how social impacts influence the dedication of the client toward utilization of the information framework for conception, clarifying, and forecasting framework usage and acceptance behaviour (Malhotra and Galletta, 1999).

### **2.2.3 The Unified Theory of Acceptance and use of Technology (UTAUT)**

Another model that has been utilized in the adoption of mobile phone technology researches is UTAUT. The UTAUT model which plans to clarify innovation acknowledgment depends on seven innovation acknowledgment hypotheses or models. Specifically, the UTAUT draws on the Theory of Reasoned Activity (TRA), the Theory of Planned Behavior (TPB), the Social Cognitive Theory, the Technology Acceptance Model (TAM), the Motivational Model, and the model of Personal Computer Utilization, the Innovation Diffusion Theory (Venkatesh et al., 2003). At its center, the UTAUT model utilizes behavioral goal as an indicator of the innovation use behavior. The included indicators of social goal depend on the segments of the eight innovation selection models evaluated.

In this model, performance expectancy, exertion anticipation, and social variables directly affects the behavioral intention, which alongside encouraging conditions affects users behaviour. The impacts of collaborations of each of execution anticipation, exertion hope and social variables with each of age and gender; collaborations of experience with every one of exertion anticipation and social components; and a cooperation of willfulness of utilization and social factors on conduct goal are additionally included. At long last, there are impacts of cooperation of age and encouraging conditions on use behavior (Venkatesh et al., 2003).

The major weakness of UTAUT and TAM is that they excluded perceived risk and trust which are major factors that can influence individuals or households from adopting mobile money (Tossy, 2014). This has been the major limitation of these models. Lee and Song (2013) found that perceived trust to directly affect technology

adoption in the UTAUT. Perceived trust was confirmed as an indirect antecedent through performance expectancy, perceived risk and effort expectancy in the model.

Perceived risk also known as seen hazard is another vital variable that was excluded in all previous models evaluated before. Perceived risk can be characterized as seen vulnerability of the result of utilizing mobile payment system. Diverse researchers have connected perceived risk distinctively in different models. According to Im et al., (2008) there was a huge distinction in perceived risk crosswise over two advancements for both pre-utilize and post-utilize. It was additionally discovered that perceived risk is dictated by trust. In the study perceived risk was utilized as a moderating construct. In another examination, it was affirmed that apparent hazard diminishes essentially the individual goal to utilize information system. According to Lee and Song, (2013) there is a huge negative relationship between trust and perceived risk. Individual users tend to utilize an innovation when they perceive hazard to be low.

### **2.3 Empirical Literature**

Various examinations have been conducted on mobile money payments. Many of the studies have been done in Kenya because of the one of a kind accomplishment of the pioneer MMTS (Safaricom's M-pesa). According to Morawczynski and Pickens (2009) the most prosperous mobile payment system in the world is M-pesa.

Jack and Suri, (2008) utilized panel data to examine the effect of appropriation of M-pesa on the welfare of the individual families. A study of 3,000 randomly selected households crosswise over Kenya was embraced for an examination on selection of

the mobile money transfer services. The sample was selected from a sampling frame that covered 92 percent of the whole Kenya populace, making it the biggest overview on MMTS in Kenya (Tobbin, 2012). The first panel on family units demonstrated that around 44 percent of the families had to some degree one part who had utilized M-pesa at some point. The outcomes demonstrated that in spite of the fact that there was no articulated distinctive between clients as far as gender was concerned, the proficient population commanded the users class while the ignorant populace ruled the unskilled population. Additionally, early users of the M-pesa were observed to be richer and more proficient than later users. A huge dominant part of respondents, 92 percent, trusted that without M-pesa their lives would be worse off.

Wesolowski et al., (2012) carried out an examination on Heterogeneous cell phone proprietorship and use in Kenya using multilevel logistic regression. Cell phone ownership was used as the dependent variable in the study. The study focused on key socio-statistic qualities comprehensive of gender, age, level of education and income per month of the house hold head. The study used dummy variables to construct a fixed effect model. The study specified the model as:

$$ownership_i = \beta_1 Age + \beta_2 Gender + \beta_3 Educ + \beta_4 Lit + \beta_5 Income + control_i + \varepsilon_i \dots 2.1$$

The study used ordinary least squares regression to estimate the coefficients. The study found that the most predictors of ownership were gender, education and literacy.

Extra regressions were performed evacuating either literacy/proficiency or education since these are emphatically related; however, this had little impact on the





$T_t$  is a year dummy to control for the time fixed effects, and  $\varepsilon_{it}$  is a random error term.

The study used panel model as shown in equation 2.3 to analyze impacts.

$$Y_{it} = \eta + \gamma MM_{it} + \kappa Z_{it} + \rho T_t + \mu_{it} \dots \dots \dots 2.3$$

Where  $Y_{it}$  is the continuous outcome variable of interest (e.g. income, convenience).  $\gamma$  is the treatment effect of mobile money use on the outcome variable. The vector of relevant covariates was captured in the model by  $Z_{it}$ .  $T_t$  was included in the specified model as a dummy variable to control time fixed effects while  $\mu_{it}$  is a random error.

The equation 2.3 was evaluated with a random effect (RE) estimator, particularly family effect (FE) to lessen heterogeneity between mobile money user and non-users. Estimation results from of the probit model clarified in equation 2.2 and 2.3 demonstrated that few factors ended up being significant. The level of education of the family head influences mobile money use in distinctly, each extra year of tutoring builds the likelihood of utilizing mobile money benefits by 1.7 percentage points. Age did not assume a significant role. Family size was additionally found to assume a critical part; families with more individuals are probably going to utilize mobile money payment systems. Further, the outcomes proposed that salary of family head affected the family choice. At long last, service provider’s qualities, for example, ease of use, convenience assumed a noteworthy part in family unit's choice of picking a mobile money use over non-utilize.

Bivariate relationship among the factors was tested using Pearson's Chi-Square, analysis of variance commonly referred as ANOVA was used to decide if there is a linear connection between behavioral expectation to embrace Mobile Money Transfer Services and the preserved usefulness. The results found that expanded TAM and DIT

models could anticipate buyer aim to utilize mobile money services. The ANOVA tests were significance at 3.1 percent demonstrating that there is a solid direct connection between intention to utilize MMTS and perceived usefulness.

#### **2.4 Overview of the Literature.**

From looking at literature review, there are family units' and logical qualities that assume a critical part in deciding if mobile money technology is adopted. A portion of these factors are incorporated into the exact work for this exploration. The greater part of the past investigations has used the Technology Acceptance Model (TAM) to uncover determinants of innovation selection. A portion of the factors that have been observed to be critical in deciding mobile money technology adoption are gender, Age, Income level of the individual, the education level, social components among others. The greater part of the investigations reviewed utilized cross-section data and estimation strategies that incorporate Ordinary Least Squares (OLS), Probit, and Logit.

Despite the fact that various examinations have been completed on mobile money transfer service, a noteworthy shortcoming of past research is the utilization of TAM (Davis, 1980, IDT Rodgers, 1995, and TPB Ajzen, 1991). These models were summed up with experimental information from the economically developed nations, which might be superfluous in the developing world context (Donner, 2009). Further, little consideration has additionally been given past the technology acceptance and utilize. It is additionally noted that no exact investigation has been completed in Nairobi County to the extent the decision for choice of Mobile Money Transfer Services providers by households is concerned. Moreover, no exact proof exists on the inclination of one or certain particular mobile money transfer service provider(s).

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1 Introduction**

This part exhibits the methodology that was utilized in accomplishing the research objectives. It incorporates the research design which was utilized, the theoretical framework adopted by the study, the specification of the model and how the model will be estimated. Further the variables are defined and their measurements given, the procedures used in collecting the data and how the data was analyzed so as to answer the questions posed in chapter one is explained in this chapter.

#### **3.2 Research Design**

Assessing mobile money transfer services market in Nairobi County was the main objective of the study. Non-exploratory research design was embraced in the study since there was no control of the members or the factors. The study collected both qualitative and quantitative data for analysis. Interviews and questionnaires were used to obtain data from both primary and secondary sources. A sample of 209 respondents was selected using Stratified and purposive sampling techniques. Both regression and correlation was utilized in the data analysis.

#### **3.3 Theoretical Framework**

Multinomial model which depicts the conduct of customers when they are faced with a variety of goods with a common utilization objective. This model was utilized in this study to dissect discrete multinomial choice decisions. Multinomial logit model which was used by Wesolowski et al., (2012), Murendo et al., (2017), Kikulwe et al., (2014) and Negassa et al., (2012), was also adopted for this study. MMTS choice was assumed to be a multinomial discrete choice variable and not binary discrete choice variable. Since consumers are assumed to be rational they choose a provider that

maximizes their utility. The utility of an individual  $i$  relies upon the characteristics of the MMTS, the attributes of the individual  $i$ ,  $X_i$  and the service provider  $j$ , ( $Z_{ij}$ ).

The utility of the individual  $i$ , looked with settling on discrete decision amongst  $J$  MMTS of the 4 Mobile Network Operators (MNO), can be given as:

$$U_{ij} = U_{ij}(X_{ij}, Z_{ij}, \varepsilon_{ij}) \dots \dots \dots 3.1$$

Where by:

$U_{ij}$ = the expected utility of consumer  $i$  who has chosen alternative MMTS  $j$ ,

$\varepsilon_{ij}$ = the error term.

$$i = 1, \dots, N$$

$$I = 1, \dots, J, \quad \text{where } J = 4$$

According to Fadden (1995) if the MMTS  $k$  is preferred to MMTS  $m$ ; the consumer then derives less utility from  $m$  than the utility derived from  $k$ .

This is expressed as:

$$U_{ik}(X_i, Z_{ik}, \varepsilon_{ik}) > U_{im}(X_i, Z_{im}, \varepsilon_{im}) \dots \dots \dots 3.2$$

The event that  $U_{ik}(X_i, Z_{ik}, \varepsilon_{ik})$  holds is not given but it will occur with some probability because the utility values are stochastic. Introducing the probability in equation 3.2

and transforming the resultant equation yields equation 3.3

$$P_{ik} = \text{prob}\{(U_{ik}(X_i, Z_{ik}, \varepsilon_{ik}) > U_{im}(X_i, Z_{im}, \varepsilon_{im}))\} \dots \dots \dots 3.3$$

$$J = 1, 2, 3, 4 \text{ and } j = 1, \dots, k, m, \dots, J$$

In equation 3.3  $P_{ik}$  represents the probability that an individual chooses  $k$  over  $m$ .

The stochastic probability in equation 3.3 given as  $U_{ij}(X_i, Z_{ij}, \varepsilon_{ij})$  can be divided further into two main components as shown in equation 3.4. That is, non-stochastic and stochastic as follows:

$$U(X_i, Z_{ij}, \varepsilon_{ij}) = V(X_i, Z_{ij}) + \Omega(X_i, Z_{ij}) \dots \dots \dots 3.4$$

Whereby  $V(X_i, Z_{ij})$  represents the *Non – stochastic* and  $\Omega(X_i, Z_{ij})$  represents the *Stochastic* part.

The random part of the utility function determines the possibilities of selecting different MMTS varieties. For example, from the set J+1 the consumer chooses MMTS range preference j which is given as:

$$P(Y_i = j|x) = P(U_{ij} > U_{ik} |x) = P(X_i\beta_j + \varepsilon_{ij} > X_i\beta_k + \varepsilon_{ik}), \text{ for all } k \neq j \dots .3.5$$

Whereby;

$Y_i$  is discrete choice variable selected by individual is  $i$ ,

$X_i$  is a vector of explanatory variables specific to  $i^{th}$  MMTS individual,

$\varepsilon_{ik}$  is unobservable random error term,

$\beta$ 's are vectors of unknown parameters to be estimated which are specific to the MMTS choice  $j$  and

The  $X_i\beta_j$  is the deterministic component of utility choice from  $j$ .

Transforming equation (3.5) yields equation 3.6:

$$P(Y_i = j|x) = P(\varepsilon_{ij} - \varepsilon_{ik} > X_i\beta_k - X_i\beta_j |x) \text{ for all } k \neq j \dots \dots \dots .3.6$$

In this manner, the likelihood that a specific MMTS or mix of MMTS is picked relies upon the joint conveyance of the distinction between the two error terms. In general, diverse decision models are produced in view of the presumptions of the dispersion for the error terms in the utility capacities. For instance, under the presumption that the disturbance terms  $\varepsilon_{ij}$  and  $\varepsilon_{ik}$  are autonomously and indistinguishably disseminated the  $\beta$  parameters are assessed utilizing multinomial logit model (MNL) (McFadden, 1974). In view of equation (3.6) the functional form of the MNL probabilistic reaction can be written as:

$$P_{ij}(Y_i = j|X) = \frac{e^{X_i\beta_j}}{\sum_{j=0}^4 e^{X_i\beta_j}} \dots \dots \dots .3.7.$$

The standardization of equation 3.7 is required keeping in mind the end goal to get exceptional parameter estimates for factors influencing consumer's MMTS decision. Standardization includes the decision of reference class and comparing the coefficients on the reference classification to zeroes (Wooldridge, 2002). The reference class utilized here is  $j=0$  which is the utilization of Safaricom's M-pesa only. With standardization, the likelihood function given in condition (3.7) brings about new logistic likelihood capacities for the three MMTS decisions as shown in equation 3.8:

$$P_0(Y_i = 0|x) = \frac{1}{1 + \sum_{j=1}^4 e^{x_i\beta_j}}, \text{ for } j = 0 \dots \dots \dots 3.8$$

$$P_j(Y_i = j|x) = \frac{e^{x_i\beta_j}}{1 + \sum_{j=1}^4 e^{x_i\beta_j}}, \text{ for } j = 1,2,3 \dots \dots \dots 3.9$$

Equation 3.8 and 3.9 is further rearranged using the inverse transformation of the logistic distribution and the odds ratio. After rearranging equation 3.8 and 3.9 the resultant equation yields a binary logit model as shown in equation 3.10.

$$\ln \frac{P_i}{1 - P_i} = \beta_1 X + \beta_2 Z \dots \dots \dots 3.10$$

According to Fadden (1975) and also assuming the Weibull distributed errors the logistic probability function of choosing MMTS  $k$  to  $m$  can be expressed as:

$$P_{ik} = \frac{e^{(X_i, Z_{ik})\beta}}{\sum_{j=1}^j e^{(X_i, Z_{ij})}} \dots \dots \dots 3.11$$

Combining the above equations and rewriting the resultant expression yields a multinomial logit model given in equation 3.12:

$$\log \left[ \frac{P_{ik}}{1 - P_{ik}} \right] = \beta_1 X + \beta_2 Z + \varepsilon \dots \dots \dots 3.12$$

Whereby:

$\varepsilon$  is the error term.

$X$  is a matrix of all individual characteristic variable.

$Z$  is a matrix of all attributes of the Mobile Money Transfer Services Provider/Market attributes.

The multinomial logit model in 3.12 is expanded to:

$$\text{MultiLogit}(MMTSh) = \beta_0 + \beta_1 Y + \beta_2 E_L + \beta_3 S + \beta_4 A_g + \beta_5 N_p + \beta_6 P_1 + \beta_7 P_2 + \beta_8 C_v + \beta_9 D_{Ag} + \varepsilon_i$$

.....3.13

If multinomial model has  $K$  categories, we estimate  $K-1$  linear equations. In this study of 4 MMTS;  $K= 4$  and therefore  $K-1= 3$ , hence the study estimated three equations.

### 3.4 Empirical Model

This study adopted the work of Murendo et al., (2015), Wesolowski et al., (2014) Negassa et al., (2012) on the household's decisions. In particular, work by Marumbwa and Mutsikiwa (2013) which extensively utilized the most eminent hypothesis of innovation adoption. Following the hypothetical propositions in section 3.2 and considering the extent of this study, Mobile Money Transfer Services Providers is expressed as a component of qualities of the consumer's and provider's attributes.

In order to achieve objective one that was to investigate the household choice of mobile money transfer service over alternatives of mobile money transfer services such as courier, traditional means (such as use Friends and relatives), Hawalas, bus and public transport etc. to send and receive money. This study employed a logit regression model. The dependent variable was dichotomous with MMTS being the

base category and taking the value 0 and the alternative to MMTS taking the value 1.

This study specified the model as:

Mobile Money Transfer Service Provider’s choice = f (Attributes of the consumer, attributes of the service providers/ attributes of the market).

$$\text{Logit}(\text{MMTsch}) = \beta_0 + \beta_1 Y + \beta_2 E_L + \beta_3 S + \beta_4 A_g + \beta_5 N_p + \beta_6 P_1 + \beta_7 P_2 + \beta_8 C_v + \beta_9 D_{ag} + \varepsilon_i \dots \dots \dots 3.14$$

**Table 3.1 Summary of the Specified Model Variables**

Attributes of the Consumer	Attributes of the Service providers/attributes of the market
Income Levels ( $Y$ ),  Education Levels ( $E_L$ ),  Sex/Gender of the Household head ( $S$ ),  Age of the Household Head ( $A_g$ ).	Transaction costs of sending/withdrawing money per MMTS ( $P_1$ ),  Number of Phones owned by an individual ( $N_p$ ),  Transaction cost of the alternative to the use of MMTS. Example courier services( $P_2$ ),  Convenience or The ease of use of Mobile money transfer services ( $C_v$ ) Ease of accessibility or the distance to mobile money agent ( $D_{Ag}$ )

In order to achieve specific objective two which was to find out the factors influencing the choice of mobile money transfer service (MMTS) providers in Nairobi County this study specified a multinomial logit regression model. The dependent variable had multiple MMTS choices with Mpesa being the base category and taking the value 1 and Equitel money, Airtel money and Orange Money taking the values 2, 3 and 4 respectively.

A Multinomial model of the function was estimated and expressed as;

$$\begin{aligned} \text{MultiLogit}(\text{MMTsch}) \\ = \beta_0 + \beta_1 Y + \beta_2 E_L + \beta_3 S + \beta_4 A_g + \beta_5 N_p + \beta_6 P_1 + \beta_7 P_2 + \beta_8 C_v + \beta_9 D_{Ag} \\ + \varepsilon_i \dots \dots \dots 3.15 \end{aligned}$$

Where:

$\varepsilon_i$  = error term of the model



$Y$  = is the monthly income of the family head.

$E_L$  = is the level of education of the family head.

$S$  = is Gender of the individual (male or female)

$A_g$  = is the number of years the household has lived

$N_p$  = number of the phones an individual owns

$P_1$  = Transaction cost of sending or withdrawing money per MMTS

$P_2$  = is the transaction cost of the alternative to the use of MMTS. Example courier services

$C_v$  = the Convenience of use

$D_{Ag}$  = The distance to mobile money agent

### 3.5 Description and Measurement of Variables

**Table 3.2: Definition and Measurement of Variables**

VARIABLE	Definition of variables	SCALE
Choice of Mobile Money Transfer Services provider	A measure of interest for the decision of Mobile Money Transfer Services provider and the particular Mobile Money Transfer Services estimated by the likelihood that a specific service provider is chosen and a Mobile Money Transfer Service is chosen.	1-M-pesa (Reference category) 2- Equitel money 3-Airtel money 4-Orange Money
Income of the individual household (Y).	This is gross pay of the individual family head.	Continuous variable
The level of education of the household head ( $E_L$ ).	This is the highest level of education attained by the person using the mobile money payment systems.	5-Degree 4-Diploma 3-KCSE 2-KCPE 1-None
Sex or Gender of the household head(S)	Female or Male	0-Female 1-Male
Age of the respondent ( $A_g$ )	Number of years from the date of birth an individual has lived	Continuous variable
The number of the mobile phones owned by the household ( $N_p$ ).	It is the number of mobile phones owned by each household	Continuous variable
Transaction cost per number of sending or withdrawing money per MMTS ( $P_1$ )	It's the amount of money paid per unit of transaction	Continuous variable
The transaction cost of the alternative to the usage of MMTS. Example courier services ( $P_2$ )	It's the amount of money paid per unit of transaction using alternative of MMTS	Continuous variable
Convenience or the ease of use( $C_V$ )	This is the quality of being useful, easy or suitable to an existing situation.	4-Strongly Agree 3- Agree 2-Disagree 1-Strongly disagree
The Ease of accessibility( $D_{Ag}$ ).	Distance covered to deposit or withdraw money for use at a later date	5- >3km 4- 1km-3km 3-500m-1km 2-300m-500m 1- < 300m

### **3.6 Study Area**

This study was done in Nairobi County (capital city of Kenya). As per The Kenya National Bureau of insights (2013), The County has an aggregate territory of  $695.1km^2$  and a population of 3,138,369 (KNBS, 2013). In 2022 the population is projected to be 4,342,054. The County has an aggregate number of 985,016 family units and is isolated into 4 areas/regions; Nairobi North, Westland's, Nairobi East and Nairobi West, and each made out of smaller regulatory units such as constituencies totaling to 17 and 85 wards the Republic of Kenya, (2014). This research was carried out in Nairobi County on the grounds that the County has the most astounding mobile network coverage contrasted with different parts of the nation and it likewise has a larger number mobile money service providers. The area likewise has a differing social-statistic population.

### **3.7 Sampling Technique and Size**

Probability sampling method was used in this study. Specifically stratified sampling method which partitioned into 4 sub-districts as recognized in section 3.6 was used. By use of Watson and Chow (2001) formula (Appendix II) a sample size of 209 was selected. The number of respondents was chosen relatively assigning out equivalent weights per locale in light of the number of inhabitants in every region. Inside every area, purposive sampling was utilized to guarantee age and gender balance.

### **3.8 Data Type and Source**

In this study primary data was used. The data was collected by use of questionnaires from the individual living in Nairobi County. The nature of the data was both quantitative and qualitative.

### **3.9 Data Collection**

Data was collected by use of questionnaires comprising of both open ended and closed ended questions. The sample size was 209 which was calculated using the formula presented in Appendix II as explained. Interview method was used due to the high rate of reaction related with it. Likewise, the research could watch non-verbal reactions. It likewise takes into account elucidation of inquiries inquired.

### **3.10 Data Cleaning, Coding and Refinement**

Information was confirmed and cleaned to guarantee just completed questionnaires were utilized. Dummy variable was allocated to qualitative data while grouped variables were scaled to make them ordinal. The information was then coded, refined and then recorded into a spreadsheet report from which it was dissected by use of statistical software.

### **3.11 Data Analysis**

Multinomial logit model was used in the data analysis. This technique involved estimation of equation 3.14 and equation 3.15 presented earlier. By taking the choice of mobile money service as the dependent variable regression analysis was employed. This was done to achieve the objectives of the study posed in chapter one.

## **CHAPTER FOUR**

### **EMPIRICAL FINDINGS**

#### **4.1 Introduction**

This chapter analyses the results from 209 questionnaires collected for this study. This chapter discusses the response rate, the various descriptive statistics and the logit and multinomial logit regression model for the determinants of mobile money transfer providers i.e. the consumer attributes and the service providers' attributes characteristics.

#### **4.2 Response Rate**

A total of 250 questionnaires were administered in all the 4 sub regions identified in this study i.e. westlands, Nairobi North, Nairobi west and Nairobi east against the targeted 209 responses. The researcher adequately trained the data collectors on the study objectives and how to collect the data in order to ensure that accurate and meaningful data for this research was collected. From the 250 questionnaires issued a total of 209 were successfully and adequately filled and returned which translates to 83.6 percent. Mugenda and Mugenda (2003) said that when the response rate is 50 percent, then the data can be considered adequate, when it is at 60 percent it can be considered as good and when it is 70 percent and over, then it can be considered excellent for data analysis. This study therefore considered the data collected for analysis as excellent for reporting.

#### **4.3 Descriptive Statistics**

This section presents the data collected from the 4 sub-sections of Nairobi. The data presented is guided by the objectives of the study which groups the results as according to the consumer attributes and the service provider's attributes.

### 4.3.1 Residency of the Respondents

Residency of the respondents was considered due to differential in levels of income depending on residency of the respondents as income was found to be a significant variable in determining technology adoption Tobbin (2012). Table 4.1 represents findings about the residency of the respondent.

**Table 4.1 Residency of the Respondent**

Residency of the Respondent		Frequency	Percent
	Nairobi west	42	20.0
	Nairobi East	74	35.4
	Nairobi North	39	18.7
	Westlands	54	25.8
	Total	209	100.0

Source: Survey data

### 4.3.2 Gender of the Respondents

The sex of the respondents was considered so as to examine the preference of mobile money transfer service providers between males and females. Table 4.2 presents the findings about the sex of the respondents.

**Table 4.2: Gender of the respondents**

Gender		Frequency	Percent
Valid	Male	100	52.2
	Female	109	47.8
	Total	209	100.0

Source: Survey data

Table 4.2 shows that the majority of the respondents in this study were male respondents accounting for 52.2 percent of the responses. This is consistent with empirical literature reviewed in chapter two, i.e. men have relative tendency to feel

more at ease in using a given technology like mobile money transfer services technology than women Gefen and Straub (1997).

#### 4.3.3 Age of the Respondents

The age of the respondents was considered so as to reveal the variation of mobile money transfer service providers between different age groups and to give an indication of whether age is important in influencing choice of service provider by residents of Nairobi County. Table 4.3 presents the age distribution among the respondents interviewed.

**Table 4.3 Age of the Respondents**

Age in Years		Frequency	Percent
Valid	18-24	60	28.0
	25-29	76	36.0
	30-34	34	17.8
	35-39	14	6.5
	40-44	11	5.1
	45-49	10	4.7
	50+	4	1.9
	Total	209	100

Source: Survey data

Table 4.3 shows the distribution of age of the respondents. The data shows that 28 percent were aged between 18 and 24 years, 36 percent were between 25 and 29 years, 17.8 percent were between 30 and 34 years, 6.5 percent were between 35 and 39 years, 5.1 percent were between 40 and 44 years, 4.7 percent were between 45 and 49 years and 1.9 percent were 50 years and above.

The numbers also correspond to Mobile Money Transfer Services usage trends along age groups where younger age groups embrace the MMTS technology more than older age groups Wesolowski *et al.*, (2012).

#### 4.3.4. Education Level

The education of respondents provided information on how MMTS providers were being chosen based on the highest level of education reached by the respondents. This information also guided the study in investigating whether literacy and exposure to diverse technologies had an influence on service provider preference. It also enabled determination of the effect of increase in education on choice of service provider.

Table 4.4 presents the highest level of education reached by the respondents.

**Table 4.4: Education Level**

Education Level	Frequency	Percent
University	102	49.1
College	46	22.0
Secondary	49	23.2
Primary	12	5.7
Total	209	100

Source: Survey data

Table 4.4 shows that 49.1 percent of the respondents were university graduates while 22 percent were college graduates, 23.2 percent were secondary school certificate holders and 5.7 percent were primary school certificate holders. This suggests that majority of respondents had been exposed to different technologies.

#### 4.3.5 Level of Income

The income of individuals was considered to examine whether choice of service provider varies across different income groups. The information guided the study to establish whether respondents' level of income affected the choice of service provider. Table 4.5 presents the income distribution of the respondents.



**Table 4.5: Level of Income**

Monthly Gross Income in Kshs.	Frequency	Percent
0-10,000	48	22.9
10,001-20,000	52	24.8
20,001-50,000	45	21.5
50,001-100,000	37	18.0
100,001-150000	17	8.1
150,001-200000	8	3.8
200,001 and above	2	0.9
Total	209	100

Source: Survey data

Table 4.5 shows the level of income of the respondents in Kenyan shillings per month. 22.9 percent earned between 0 and 10,000, 24.8 percent earned between 10,000 and 20,000, 21.5 percent earned between 20,000 and 50000, 18 percent earned between 50,000 and 100,000, 8.1 percent earned between 100,000 and 150000, 3.8 percent earned between 150,000 and 200,000 and 0.9 percent earned above 200,000. This is a true representation of the county's income distribution, where majority of individuals belong to the lower and middle class, with the upper class having the smallest proportion (Republic of Kenya, 2014).

#### **4.3.6 Mobile Money Transfer Services Awareness**

The level awareness of the respondents was considered so as to reveal the variation of different mobile money transfer service between different respondents and to give an indication of whether level of awareness of service providers is important in influencing choice of service provider by residents of Nairobi County. Table 4.6 presents the level of awareness of MMTS providers among the respondents interviewed. The total number of respondents were 209.

**Table 4.6: Level of Awareness of Mobile Money Transfer Services**

Service Provider		Responses	Percent of Cases
		N	
	Mpesa	202	97%
	Airtel Money	123	59%
	Orange Money	70	33%
	Equitel Money	110	53%
	Mobikash	36	17%
	Yu Cash	16	8%

Source: Survey Data (May, 2017)

The results in table 4.6 shows that Mpesa is the most popular MMTS with 97 percent of all respondents being aware of it, Airtel money follows second with 59 percent of the respondents being aware of it, Equitel money is the third most popular MMTS with 53 percent of respondents in Nairobi being aware of it followed by orange money at 33 percent then Mobi-kash at 17 percent and the least known MMTS is Yu cash at 8 percent. These results are consistent with various researchers; USAID (2011), CAK (2013), Jack and Suri (2011) who found out Safaricom was dominant service provider.

#### **4.3.7 Usage of Mobile Money Transfer Services Providers**

In addition to awareness of existence of various MMTS providers as shown in table 4.6 above, respondents were asked which service provider(s) they use; this was critical additional information in identifying factors behind choosing particular MMTS provider over others. Table 4.7 presents usage of MMTS among the respondents interviewed. The total number of respondents were 209.

**Table 4.7 Usage of Mobile Money Transfer Services Providers**

Service Provider		Responses	Percent of Cases
		N	
Usage	Mpesa	197	94%
	Airtel Money	54	26%
	Yu Cash	2	1%
	Orange Money	11	5%
	Mobi-Kash	9	4%
	Equitel	43	21%

Source: Survey Data

Table 4.7 shows that 94 percent of all respondents used M-pesa, 26 percent of all respondents used Airtel money, 21 percent used Equitel money, 5 percent used orange money, 4 percent used Mobi-kash and 1 percent used Yu Cash. This showed that in Nairobi County the most commonly used MMTS provider was Mpesa with the usage of 94 percent which is more than all other service providers combined as indicated in the above table. These results are consistent with various researchers; USAID (2011), CAK (2013), Jack and Suri (2011) who found out Safaricom was dominant service provider. Further M-pesa is cited one of the most successful mobile phone- based financial service in the developing world (Jack and Suri, 2011).

#### **4.3.8 Frequency of Usage of Mobile Money Transfer Services.**

In order to reveals the importance of MMTS to the households of Nairobi County, respondents were asked on the frequency of usage of various MMTS. Table 4.8 presents frequency of usage of MMTS among the respondents interviewed. The total numbers of respondents were 209.

**Table 4.8 Frequency of usage in a week (After how many days do you use MMTS?)**

Frequency of Usage in Days		Frequency	Percent
Valid	Daily	109	52.1
	1 Day	23	11.0
	2 Days	27	12.9
	3 Day	10	4.8
	4 Days	6	2.9
	5 Days	14	6.7
	6 Days	20	9.6
	Total	209	100.0

Source: Survey Data

The results showed that 52.1 percent of the users used MMTS services daily while 11 percent used the services after every one day, 12.9 percent used the MMTS services in every 2 days, 4.8 percent used them after every 3 days, 2.9 percent used the services after every 4 days, 6.7 percent after every 5 days and 9.6 percent after every 6 days.

The results are consistent with findings of Ignacio Mas and Dan Radcliffe (2010) who found out the uptake of Mobile Money Transfer Services to be on an upward trend and represented 40 per cent of adult population.

#### **4.3.9 Frequency of Usage in a week per MMTS Service Provider**

To reveal the importance of specific MMTS service provider to the households of Nairobi County, the respondents were asked on frequency of usage of specific service provider. Table 4.9 below presents frequency of usage of specific MMTS among the respondents interviewed. The total numbers of respondents were 209.

**Table 4.9: Frequency of Usage of Mobile Money Transfer Services per Provider.**

Usage of MMTS							
Frequency of usage		Mpesa	Airtel Money	Yu Cash	Orange Money	Mobi-kash	Equitel
	Daily	52.6%	40.7%	0.0%	27.3%	44.4%	46.5%
	1 day	11.7%	20.4%	50.0%	45.4%	22.2%	18.6%
	2 days	13.2%	14.8%	0.0%	18.2%	11.2%	16.3%
	3 days	4.1%	3.7%	0.0%	0.0%	0.0%	2.3%
	4 days	2.6%	5.6%	0.0%	0.0%	0.0%	0.0%
	5 days	6.6%	7.4%	50.0%	9.1%	0.0%	9.3%
	6 days	9.2%	7.4%	0.0%	0.0%	22.2%	7.0%
	Total	100%	100%	100%	100%	100%	100%

**Source: Survey data**

The results as in table 4.9 shows that the highest percentage of 52.6 percent of Mpesa services users use the MMTS daily while 40.7 percent of Airtel money services users use the services daily. Most of Yu cash services users use the services after every one day and 5 days as shown by the 50 percent frequency. The highest percentage of orange money users use the service after every one day with a percentage of 45.4 percent while the most of Mobi-kash users and Equitel users use the services daily at 44.4 percent and 46.5 percent respectively. These results are consistent with CAK survey carried out in 2013 which indicated that M-pesa has the largest market share followed by Airtel money.

#### **4.3.10 Usage of Mobile Money Transfer Services**

To identify major uses of MMTS, respondents were asked on what they used the service for. Table 4.10 below presents ways of utilizing MMTS among the

respondents interviewed. The total numbers of respondents were 209. Some of the respondents used MMTS in more than one way hence number of responses exceeded 209.

**Table 4.10: Ways of Using Mobile Money Transfer Services**

Ways of Utilizing Mobile Money Transfer Services		Responses	Percent of Cases
		N	
	Paying bills	157	75.1%
	Sending money	183	87.6%
	Receiving Money	170	81.3%
	Saving	109	52.2%
	Borrowing	74	35.4%

Source: Survey data

Table 4.10 shows the services that the respondents use with MMTS. 87.6 percent of the respondents use the MMTS services to send money, 81.3 percent used MMTS to receive money, 75.1 percent used MMTS to pay bills while 52.2 percent used the money to save and 35.4 percent used the MMTS to borrow money. This shows the importance of MMTS services in easing the sending and receiving of money and payment of bills.

These results are consistent with finding by Asongu (2015) where savings and borrowing featured prominently, hence raising financial inclusivity among households of Nairobi County.

#### **4.3.11 Usage of Mobile Money Transfer Services Per Provider**

To identify various ways of using MMTS by households, respondents were asked to indicate which ways they utilized their service providers of choice. The results are presented in table 4.11 below.

**Table 4.11: Usage by MMTS Service Provider**

		Mobile Money Transfer Service Providers						Total
		Mpesa	Airtel Money	Yu Cash	Orange Money	Mobi-kash	Equitel	
Paying bills	Count	149	44	2	9	8	37	153
	%	75.6%	81.5%	100.0%	81.8%	88.9%	86.0%	
Sending money	Count	174	49	2	11	8	40	180
	%	88.3%	90.7%	100.0%	100.0%	88.9%	93.0%	
Receiving Money	Count	162	49	2	11	7	41	168
	percent	82.2%	90.7%	100.0%	100.0%	77.8%	95.3%	
saving	Count	105	31	2	8	7	28	108
	percent	53.3%	57.4%	100.0%	72.7%	77.8%	65.1%	
Borrowing	Count	71	18	1	6	4	19	73
	%	36.0%	33.3%	50.0%	54.5%	44.4%	44.2%	
Total	Count	197	54	2	11	9	43	204

Percentages and totals are based on respondents

Source: Survey Data

Table 4.7 shows that most of the users of the MMTS providers use the services to pay bills, send money and receive money. This shows that MMTS service providers have made it easy for customers to send and receive money as well as pay the bills. However, comparatively, saving and borrowing is not so much a used service by the customers as can be seen specifically by looking at the percentages of the two leading MMTS providers (Mpesa and Airtel Money) which are 53.3 percent and 57.4 percent for savings and 36 percent and 33.3 percent for borrowing respectively.

#### 4.3.12 Access to Mobile Money Transfer Services Provider's Information

To identify source of information of MMTS which in turn affects the levels of awareness, respondents were asked to indicate the source of information on MMTS.

Table 4.12 below represents various sources of information.

**Table 4.12: Source of Service Providers' Information**

Source of Service providers' Information		Responses	Percent of Cases
		N	
Access to Information	Word of mouth	68	32.5%
	Internet/Social media	134	64.1%
	Newspaper/Magazines	73	34.9%
	TV	138	66.0%
	Radio	91	43.5%

Source: Survey Data

The results in Table 4.12 shows that a majority of the respondents in Nairobi county receive MMTS provider information from their TV stations with 66 percent, 64.1 percent of them claimed to have been accessing the information by internet, 43.5 percent claimed to have been accessing the information via Radio stations, 34.9 percent via newspapers and 32.5 percent via word of mouth. This showed that the most effective advertising platform for MMTS providers in Nairobi County was by TV stations and Internet/Social media outlets.

The results are consistent with The International Telecommunication Unions (ITU) Survey conducted in 2015; the study ranked Television (TV) as the second most rapidly diffused consumer-based technology after mobile telephone technologies.

#### **4.3.13 Influence of Transaction Costs Reviews on choice of MMTS Provider**

The table 4.13 below shows responsiveness of households to cost reviews by MMTS provider.



**Table 4.13: Influence of Transaction Costs Reviews**

Rating		Frequency	Percent
Valid	Not influential	34	16.3%
	Slightly influential	100	47.8%
	Very influential	75	35.9%
	Total	209	100%

Source: Survey Data

The table 4.13 shows that most of the respondents in Nairobi county feel that transaction costs reviews in the MMTS providers had some slight influence on their choice of MMTS with 47.8 percent while 35.9 percent of the respondents suggested that the transaction costs reviews were very influential in their choice of MMTS providers while only a small percentage of 16.3 percent felt that transaction costs reviews had no influence on their choice of MMTS provider.

Further analysis, the findings showed that the cost of transaction was a significant factor in all MMTS choices at 5 percent level of significance.

#### **4.3.14 Amount of Money used on MMTS Transaction Costs in a month**

In order to find out if transaction costs of using specific MMTS providers was significant in determining the choice of MMTS over other alternative such as courier services, households were asked to indicate their expenditure on transacting in the mobile money platforms. Table 4.14 presents the results.

**Table 4.14: Amount of money used on MMTS transaction cost per month**

Monthly Amount of Money Spent on use of MMTS in Kshs.	Frequency	Percent	
Valid	1-50	12	5.7%
	51-100	13	6.2%
	101-150	16	7.7%
	151-200	15	7.2%
	201-300	22	10.5%
	301-500	19	9.1%
	501-800	18	8.6%
	801 and above	94	45.0%
	Total	209	100%

Source: Survey Data

The results show that a significant 45 percent of the respondents in Nairobi incurred a cost of Kshs. 800 and above per month. The next closest percentage was 10.5 percent for individuals who incurred a cost of between 200 and 300 Kenyan shillings per month. This implied that most Nairobi residents incurred a high cost of transaction under their MMTS service providers. This could be attributed to the fact that most of the respondents used the MMTS daily as seen in table 4.8 and this high frequency of usage would lead to high transaction costs.

#### **4.3.15 Analysis of Collinearity between Explanatory Variables**

Analysis of collinearity was done for the explanatory variables to be included in the model. It provided information about the degree of linear association of the variables to determine whether any of the variables would present a problem of multi collinearity. The study used pair wise matrix correlation analysis to determine the degree of correlation between the variables and the results are presented in table 4.15

**Table 4.15 Correlation Matrix**

	Correlations									
	(S).	(A <sub>g</sub> ).	(E <sub>L</sub> ).	Y.	(P <sub>1</sub> ).	(D <sub>Ag</sub> ).	(C <sub>V</sub> ).	(N <sub>P</sub> ).	(P <sub>2</sub> ).	MMTS preference
(S).	1									
(A <sub>g</sub> ).	-0.048	1								
(E <sub>L</sub> ).	-0.018	0.160	1							
Y.	-0.072	0.433	0.303	1						
(P <sub>1</sub> ).	-0.087	0.110	0.000	0.249	1					
(D <sub>Ag</sub> ).	-0.056	-0.002	-0.109	0.149	0.123	1				
(C <sub>V</sub> ).	-0.113	0.000	-0.138	0.180	0.104	0.556	1			
(N <sub>P</sub> ).	-0.007	0.051	0.214	0.031	0.169	0.301	0.362	1		
(P <sub>2</sub> ).	-0.006	0.046	0.312	0.265	0.158	0.156	0.354	0.304	1	
MMTS preference	0.002	-0.009	-0.096	0.12	0.128	0.182	0.095	0.18	0.089	1

Source: Survey Data

The results showed that the correlations between the variables were low and therefore could not significantly affect the results of the regression model. The highest correlation value was between ease of accessibility and convenience with a value of 0.556. This was followed by correlation between the amount of earned and the age of the respondents with 0.433. The rest of the correlation values were below 0.4. This correlation values were significantly low below the acceptable 0.7.

#### 4.4 Logit Regression Model

In order to achieve objective one which was to investigate the household choice of mobile money transfer services over alternatives of mobile money transfer services (such as courier, traditional means such as use Friends and relatives, Hawalas, bus and public transport etc.). Nairobi County, this study conducted a logit regression model. The dependent variable was choosing between MMTS services or the alternatives such as use courier services, traditional means example use of friends and relatives,

public transport such as buses to send and receive money. The choice of MMTS services being the reference category. The Logit regression was carried out in two steps. The first step was the determination of the log odds of the independent variables and the results are presented in table 4.16.

**Table 4.16: Logit Regression with log odds Estimates**

**Logistic Regression**

	Coefficients	S.E.	Z statistic	P> Z	95% C.I.	
					Lower	Upper
Gender	0.545	0.369	1.477	0.440	0.336	3.555
Age	-0.106	0.041	-2.606	0.045	-0.638	1.268
Education Level	-0.454	0.246	-2.845	0.016	-0.592	1.030
Income	-0.528	0.188	-2.808	0.005	-0.608	0.852
Cost of Transaction of MMTS	0.446	0.150	2.973	0.023	0.386	2.757
Cost of transaction alternative of MMTS	0.208	0.088	2.373	0.034	0.105	1.065
Ease of accessibility	-0.444	0.342	-1.298	0.094	-0.528	1.255
Convenience	0.243	0.305	0.797	0.425	0.102	2.319
Number of Mobile Phones	-0.483	0.314	-1.538	0.125	-0.533	1.143
Constant	1.494	0.639	2.338	0.041		

Source: Survey Data

Number of observation=209, Prob>Chi2(8) =483.01, Prob>Chi2=0.000; Pseudo R<sup>2</sup>=0.16120, LR Likelihood= -62.536

From table 4.16 the pseudo R<sup>2</sup> value was 0.1612 which implied that 16.12 percent of all changes in the dependent variable were explained in the model. However, since the logistic regression model maximum likelihood estimates are arrived at by the iteration method then the OLS method of goodness of fit and the R<sup>2</sup> interpretations do not hold. In addition, the odds ratio in the logit model cannot be interpreted but instead the

second step is to estimate the marginal effects which are to be interpreted. The results of the marginal effects are presented in table 4.17

**Table 4.17: Marginal Effects Results**

**Marginal Effects**

	Dy/Dx	S.E.	Z statistic	P> Z	95% C.I.	
					Lower	Upper
Gender	0.004	0.003	1.501	0.471	-0.1120	0.1033
Age	-0.011	0.004	-2.606	0.050	-0.0211	0.2011
Education Level	-0.112	0.039	-2.855	0.019	-0.5592	1.3335
Income	-0.230	0.079	-2.900	0.009	-0.7008	2.0620
Cost of Transaction of MMTS	0.189	0.063	3.001	0.027	-0.2091	1.3023
Cost of transaction alternative of MMTS	-0.130	0.055	-2.373	0.040	0.0005	1.3022
Ease of accessibility	-0.048	0.036	-1.301	0.102	-0.1246	2.4950
Convenience	0.109	0.137	0.797	0.438	-0.1235	1.0734
Number of Mobile Phones	-0.290	0.188	-1.541	0.129	-0.5048	-0.0198

Source: Survey Data

The marginal effects as in table 4.17 show that the variables Age, Education level, income, cost of transaction of MMTS and cost of transaction of alternative to MMTS were significant at 5 percent level. However, Gender, ease of accessibility, convenience and number of mobile phones were not significant at 5 percent level. Specifically, the coefficient of age, education level and income were negative with coefficient values of -0.011, -0.112 and -0.230 respectively. This implied that an increase in age, education level or income by one unit would lead to a decrease in the probability that an individual chooses the alternative of MMTS and is more likely to choose MMTS services by 0.011, 0.112 and 0.230 units respectively.

The results also showed that the coefficient for the cost of transaction of MMTS was positive as expected. This implied that an increase in the cost of transaction of MMTS providers by one unit would lead to an increase in the probability that individuals opt for alternatives to MMTS services by 0.189. The coefficient for the cost of transaction

for alternatives to MMTS also had the expected negative sign. This implied that an increase in the transaction cost of alternatives to MMTS by one unit would lead to a decrease in the probability that individuals prefer MMTS alternatives by 0.13. These results were similar to the conclusions of Kilulwe et al., (2014) who concluded that education level and income of the household were significant factors in determining the decision to adopt an MMTS provider.

These findings however contradicted the same study since it concluded that provider characteristics such as convenience and ease of use were significant variables in explaining the choice between MMTS and its alternative. The study was also similar to the conclusions of Meso et al., (2005) who concluded that gender was not significant variable in explaining the choice.

#### **4.5 Multinomial Logit Regression Model for the Factors that Influence the Choice of Mobile Money Transfer Service (MMTS) Providers in Nairobi County.**

In order to achieve objective two that was to find out the factors that influence the choice of mobile money transfer service (MMTS) providers in Nairobi County this study conducted a multinomial logit model. The dependent variable was the different choices of MMTS providers with M-pesa being the base category. The results of the multinomial logit model are shown in table 4.18.

**Table 4.18: Multinomial Logit**

Choice of MMTS <sup>a</sup>		B	Std. Error	Z statistics	Sig.	95% Confidence Interval for Exp (B)	
						Lower Bound	Upper Bound
Airtel Money	Intercept	-4.243	0.417	-10.168	0.000		
	Age	0.283	0.180	1.572	0.159	0.939	1.874
	Earning	-0.158	0.259	-.608	0.562	-0.574	1.270
	Cost of transaction	-0.488	0.206	-2.374	0.049	-0.876	3.031
	Ease of access	-0.330	0.124	2.659	0.032	-0.627	3.087
	Convenience	-0.017	0.001	2.005	0.085	-0.621	1.666
	Number of mobile phones	0.485	0.115	0.222	0.590	1.023	2.580
	Education	0.005	0.002	-2.501	0.041	0.561	1.765
	Gender	-0.724	0.456	-1.587	0.156	-0.201	1.171
Orange Money	Intercept	-6.973	0.771	-9.038	0.000		
	Age	0.238	0.270	0.880	0.408	0.771	2.089
	Earning	-0.204	0.400	-0.510	0.625	-0.466	1.427
	Cost of transaction	-1.118	0.301	-3.709	0.007	-0.980	9.542
	Ease of access	-0.353	0.149	-2.365	0.050	-0.452	4.482
	Convenience	-0.221	0.064	-3.456	0.011	-0.871	1.785
	Number of mobile phones	0.545	0.110	0.971	0.782	1.068	2.787
	Education	-0.292	0.627	-0.466	0.655	-0.323	1.725
	Gender	-0.264	1.443	-0.183	0.860	-0.230	2.570
Equitel Money	Intercept	-5.538	0.711	-7.781	0.000		
	Age	-0.249	0.202	-1.233	0.257	-0.503	1.210
	Earning	0.321	0.134	2.388	0.048	0.917	2.073
	Cost of transaction	-0.216	0.063	-3.423	0.011	-0.647	2.384
	Ease of access	-1.584	0.343	-4.615	0.002	-1.149	20.666
	Convenience	-0.722	0.308	-2.344	0.050	-0.143	1.646
	Number of mobile phones	0.627	2.287	0.434	0.700	1.193	2.938
	Education	0.272	0.074	3.658	0.008	0.394	1.471
	Gender	0.220	0.957	0.230	0.825	0.507	3.067

Source: Survey Data

The results in table 4.18 show the results of the multinomial logit model for the different MMTS choices. The results show that generally Age, number of mobile phones and gender were not significant all along in determining the choice of MMTS service provider across the different service providers. The rest of the factors affecting the choice of MMTS services are discussed further in section 4.4

These results in table 4.18 show that income was a significant factor only for the case of Equitel money but was not significant for both Airtel and orange Money at 5 percent level. More specifically, the variable income had a positive value which meant that an increase in the income of the individual would lead to an increase in the probability of the individual preferring Equitel money transfer services over M-pesa money transfer services. This can be explained by the fact that Equity is one of the most popular banks in Kenya (Cytonn, 2018), most people with money tend to store up their cash in the bank and therefore would prefer transacting most of their transactions using Equitel money transfer services.

The findings showed that the cost of transaction was a significant factor in all MMTS providers choices at 5 percent level of significance. The coefficient of this variable was negative for all the three models. This implied that an increase in the cost of transaction in MMTS service would have led to an increase in the probability that individuals will shift to the alternative MMTS providers choices. This is quite reasonable considering that individuals are discouraged by high costs of transaction and will therefore opt to seek a different MMTS providers choice if at all the transaction costs is increased. This finding is similar to Kikulwe et al., (2014) who observed that perceived costs influenced the choice for the adoption of a particular MMTS choice. This result is further supported by the descriptive statistics in table



4.13 where 83.6 percent of respondents stated that transaction costs reviews had at least, a slight influence on the choice of MMTS service provider.

The results showed that the coefficient for ease of access was significant in all the three models at 5 percent significance level. The coefficients also assumed a negative value in all the models. This implied that decrease in the ease of access of an MMTS service provider would lead to a decrease in the probability of an individual choosing that specific MMTS service provider. This therefore meant that ease of access was a major factor in having a competitive advantage among MMTS service providers. These findings are in concurrence with various studies such as Marumbwa and Mutsikiwa, (2013) and Kikulwe et al., (2014) who found that accessibility of mobile money transfer service providers played a significant role in determining user acceptance.

The findings also showed that the coefficient for convenience was significant in all the three models at 5 percent significance level. The coefficients also assumed a negative value in all the models. This implied that an increase in the convenience in the M-pesa service would lead to a decrease in the probability of an individual choosing Airtel money, Orange money and Equitel. Various researchers found out that convenience of technological innovation such as mobile money transfer services determined perceived usefulness and hence adoption of technology. For instance, Lu, Yu, Liu and Yao (2003) argued convenience of technology directly affected perceived usefulness and hence affected user acceptance. However, Davis (1989) argue that external factors affect intention and actual use of technology through mediated effects on perceived usefulness and perceived use.

The results showed that the coefficients for education was significant for the case of Airtel money and Equitel but was not significant for orange money at 5 percent significant level. The coefficients had a positive sign which implied that an increase in the education level of an individual would lead to the increase in the probability that an individual will choose Airtel money or Equitel over M-pesa. The findings are supported by Wesolowski et al., (2012) in their study who found out that literacy levels as predictors of mobile phone ownership usage such as use of transacting mobile money transfer services. A study by Kikulwe et al., (2014) found out that there was a positive relationship between the level of education and the use of mobile money. According to Kikulwe et al., (2014) additional year in school will improves the possibility of utilizing mobile money by 1.7 points.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary and conclusions derived from the study findings. The policy implications and areas for further research are also suggested.

#### **5.2 Summary**

The main objective of the study was to assess the household's choices of mobile money transfer services in Nairobi County. This study sought to achieve this specifically by investigating the household choice of MMTS over the alternative to MMTS and by finding out the factors that influence the choice of MMTS providers in Nairobi County. This study sought to achieve these objectives using descriptive statistics, a logit regression model and a multinomial regression model.

This study collected data from 209 respondents in Nairobi County which represented 83.6 percent response rate. The results showed that there were an almost equal number of males and females in our respondents and that most of them had attended university education. The findings showed that in Nairobi County the most popular MMTS provider was M-pesa followed by Airtel money and Equitel money and the least popular MMTS provider was Yu cash. The findings showed that Mpesa had a significant high number of users compared to other MMTS providers with over double their percentages.

The study results also showed the importance of MMTS with over half of the respondents claiming that they used or relied on MMTS daily in some way. The findings further showed that a high percentage of the respondents used MMTS for

sending and receiving money as well as paying of bills. However, comparatively a low percentage of respondents used MMTS for saving and borrowing of money. The findings also showed that most of the respondents received their MMTS provider information from TV stations and internet/social media platforms. Further, the findings showed that most of the respondents were influenced by transaction costs reviews in making their choice of MMTS service providers. The study also showed that most of the individuals incurred a high cost of transaction which could be attributed to the fact that many of the respondents stated that they used the MMTS provider services daily.

This study used the logit regression model to access the consumer's choice between MMTS and alternatives to MMTS. The results showed that the variables age, education level, income, cost of transaction of MMTS and cost of transaction of alternative to MMTS were significant in explaining the choice between MMTS and their alternatives. Specifically, the findings indicated that an increase in age, income and education level would lead to a decrease in the probability that the consumers choose MMTS alternatives to MMTS. The findings also showed that an increase in the transaction costs of MMTS discourages the customers from using the MMTS just as an increase in the transaction costs of alternatives to MMTS would discourage customers from increasing using the alternatives to MMTS. These findings underlined the importance of transaction costs in the making of customer's decisions in regard to MMTS provider and their alternatives.

This study also conducted a multinomial regression analysis to access the factors that influence the choice of MMTS providers in Nairobi County with M-pesa being the reference category. The findings showed that age, number of mobile phones owned by a household and gender were not significant factors in determining the choice of

MMTS service providers in the three models. However, the results showed that income was a significant factor with in the case of Equitel money but was not significant for the case of Airtel money and orange money. The findings also further showed the importance of transaction costs among the different MMTS providers as the results showed that an increase in the transaction costs of any the MMTS providers would discourage consumers from using them. This was shown by the significance of the transaction costs coefficient in all the three models.

Further, multinomial regression analysis showed that the coefficient for ease of access was significant in all the three models at 5 percent significance level. The coefficients also assumed a negative value in all the models. This implied that decrease in the ease of access of an MMTS service provider would lead to a decrease in the probability of an individual choosing that specific MMTS service provider. This therefore meant that ease of access was a major factor in having a competitive advantage among MMTS service providers

### **5.3 Conclusion**

The study confirmed that indeed of all the attributes of the service provider/attribute of the market, ease of access, convenience and cost of transactions of using MMTS were of most significance. The study implied that customers were more inclined to choosing MMTS service providers that were easily accessible, convenience to use and with minimal cost of transactions. Similarly, on the attributes of the consumers, this study found out that variables age, education level and income, were significant in explaining the choice between MMTS providers and their alternatives. Specifically, the findings indicated that an increase in age, income and education level would lead to a decrease in the probability that the consumers choose MMTS alternatives to MMTS service providers.

#### **5.4 Recommendations**

First, the results showed that the most popular MMTS service provider was Mpesa with other MMTS providers being not so popular among many Nairobi county respondents. The study also showed that most of the respondent received information about MMTS providers through the TV and internet/ social media platforms. This study therefore recommends that the MMTS providers could place advertisement and sensitization measures to make their services more popular through the TV adverts and social media platforms. The MMTS service providers should invest more money in their online social media platforms and use them to pass information about their products and services, this will raise awareness of existence of MMTS.

Secondly, MMTS providers need to increase their advertisement on their savings and borrowing services. This is because the findings showed that individuals used MMTS more for paying bills and sending money and less on saving and borrowing of money. The MMTS providers should then seek to find out if the interest rates which it charges are high and that's why it discourages the customers from using the services or if it's a lack of knowledge on the savings and borrowing services that caused the low use of the savings and borrowing services.

Thirdly, this study recommends that the MMTS providers should take high consideration before making any transaction costs reviews. This is because the findings showed that the respondents are highly influenced by transaction cost reviews and will most likely change their choice of MMTS service if the reviews made displease them. MMTS service providers should therefore try to always give valid reasons to their customers as to why any transaction cost is necessary otherwise they face a risk of losing many customers.

Fourthly, this study recommends that MMTS providers should consider their transaction costs comparatively to their competitors. These competitors are in two fold; first one being the alternatives to MMTS and the second one being other MMTS providers. This is because the findings showed that any increase in the transaction costs of any of the MMTS providers discourages the individuals from choosing the MMTS provider in favor of their competitor.

Lastly, this study also recommends that MMTS service providers need to ensure that their MMTS services are easily accessible and more convenient to the customers. This implies that the MMTS providers should ensure that they have many outlets for their mobile money services as possible in order to bring their services closer to the customers as this is a significant factor in determining their choice. In order to ensure convenience, the MMTS providers should ensure that their MMTS are easy to follow and use and should not have long and complicated procedures as convenience was another significant factor in an individual's choice for a MMTS provider.

#### **5.4 Suggestions for Further Research**

Further studies could further the analysis by enhancing the analysis of social structures such as the difference in education levels, age and accessibility. Other studies could also include factors such as fraud perception, consumer protection, costs associated with switching from one MMTS provider to another and security associated with mobile money providers. Finally, other studies could do the same research in the other 46 counties in Kenya in order to facilitate comparison and give a whole outcome for the country.

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**Appendix I**  
**QUESTIONNAIRE**

The major objective of the study will be to assess the household's choices of mobile money market in Nairobi County. This will lead to award of Masters of Economics (Policy and Management) degree at Kenyatta University. The questionnaire inquiries from you about the mobile money transfer service provider(s) you use and the reasons for your choice.

Your contribution is highly valued, as it will in addition contribute towards proposing the policies pertaining on how to enhance the provision of Mobile Money Transfer Services (MMTS) in Kenya. These questions are directed to all persons who use the MMTS and specifically household heads with the assistance of an interviewer. All the information provided will be treated with maximum confidentiality and used strictly for academic purposes.

Any questions or clarifications concerning this questionnaire can be directed to:

Mbuguah John e-mail: [mbuguahjontay@gmail.com](mailto:mbuguahjontay@gmail.com)

Cell: 0721511018

**Serial No.** .....

**Date**...../...../.....

## **Section A: Demographics**

### **1. Residency of the Respondent**

- a. Nairobi West [ ]      b. Nairobi East [ ]      c. Nairobi North [ ]      d. Westland's [ ]

### **2. Gender of respondent**

- a. Male [ ]      b. Female [ ]

### **3. Age of Respondent**

18 – 23 years [ ]      42 – 46 years [ ]

24 – 29 years [ ]      47 – 52 years [ ]

30 – 35 years [ ]      53+ years [ ]

36 – 41 years [ ]

### **4. Highest level of education reached**

- a. KCPE [ ]      b. KCSE [ ]      c. Diploma [ ]      d. Degree [ ]      e. None [ ]

**5. On average how much would you say you earn per month (Gross Pay) in Kenya shillings?**

0 – 10,000                    [    ]                100,001 -150,000                [    ]

10,001 – 20,000             [    ]                150,001- 200,000                [    ]

20,001 – 50,000             [    ]                200,001- and above                [    ]

50,001 – 100,000            [    ]

**Section B: Mobile Money Transfer Services Usage/Awareness.**

**1. Are you aware of Mobile Money Transfer Service (MMTS) Providers?**

**a. Yes {    }**

**b. No {    }**

**2. If Yes to (1) above which Mobile Money Transfer Service (MMTS) Providers are you Aware of?**

a. M-Pesa                    [    ]

b. Airtel Money             [    ]

c. Orange Money          [    ]

d. Equitel Money          [    ]

e. Mobikash                [    ]

f. Tangaza money          [    ]

g. Others (Specify).....

**3. Do you use Mobile Money Transfer Services?**

a. Yes                    [    ]

b. No                    [    ]

**4(a). If yes how often do you use Mobile Money Transfer Services in a week?**

[a.] Daily [ ] [c.] 1 day [ ] [e] 2 days [ ] [g.] 3 days [ ]

[b.] 4 days [ ] [d.] 5 days [ ] [e.] 6 days

**(b) How do you use Mobile Money Transfer Services?**

- a. Paying bills (utility bills, entertainment) [ ]
- b. Sending money (sending money abroad, rural areas, urban) [ ]
- c. Receiving money [ ]
- d. Saving [ ]
- e. Borrowing [ ]

(c) Where do you get information about new services on Mobile Money Transfer services?

- a. Word of mouth [ ]
- b. Internet/ Social media [ ]
- c. Newspaper/Magazines [ ]
- d. TV [ ]
- e. Radio [ ]
- f. Others (specify) .....

**5. Do you use alternatives of mobile money transfer services?**

a. Yes [ ] b. No [ ]

**6. If Yes for number 5 which alternative do you use?**

- a)Hawalas [ ]
- b) Courier services [ ]



c) Friends and relatives [ ]

d). Bus and public means of transport [ ]

e) Others (Specify)..... [ ]

**7. How would you rate your preference of Mobile Money Transfer Services compared with other means of sending and receiving money?**

**(Tick appropriately)**

	Strongly Prefer MMTS	Neutral	Strongly Prefer Alternative Methods
Preference			

**Section C: Mobile Money Transfer Services Providers Characteristics.**

**1. To what extent do the following characteristics influence your choice of Mobile Money Transfer Services provider to use?**

	TICK $\checkmark$		
	Not Influential	Slightly Influential	Very Influential
Cost of transaction			
Ease of Accessibility			
Convenience			
Number of mobile phone devices/SIM cards you own			

**2. To what extent do the transaction costs reviews influence your choice of mobile money transfer service provider to use?**

	Not influential [                    ]		slightly influential [                    ]		very influential [                    ]

3. Which mobile money transfer service provider(s) do you **use**?

- a. M-pesa                    [   ]    e. Mobi-kash                    [   ]
- b. Airtel money                    [   ]    f. Tangazapesa                    [   ]
- c. Yu Cash                    [   ]    g. Equitel                    [   ]
- d. Orange Money [   ]

4. How far is the nearest mobile transfer service provider? (Tick where applicable)

MMTS provider	Less than 300 m	Between 300m-500m	Between 500m- 1km	Between 1km -3km	More than 3 km away
M-pesa					
Airtel Money					
Orange Money					
Mobi-kash					
Tangazapesa					
Equitel					

5. Of the choices presented above, which one (s) would you like to use but are not accessible to you?

.....

.....

6. Highlight **four** reasons of choosing the service provider(s) you are subscribed to.

a).....

b).....

c).....

d).....

**Section D: COST OF TRANSACTIONS.**

**1. In which ways do you access mobile money transfer services?**

a. From own phone device(s) [ ]

b. By assistance from agent [ ]

c. Borrowing of phone devices [ ]

d. Internet applications [ ]

**2. On average how much do you spend on use of MMTS in Kenya**

**shillings per Month? (Transaction costs)**

1 - 100 [ ]      401-500 [ ]

101–200 [ ]      501- 600 [ ]

201 - 300 [ ]      601- 700 [ ]

301 – 400 [ ]      701 and above [ ]

**3. On average how much do you spend on use of alternative Mobile Money Transfer Services in Kenya shillings Month? (Tick if Applicable)**

1 - 100	[ ]	401-500	[ ]
101–200	[ ]	501- 600	[ ]
201 - 300	[ ]	601- 700	[ ]
301 – 400	[ ]	701 and above	[ ]

***The End.***

***Thank you for your time &responses.***

## Appendix II: Sample Size Determination Formula

Sample Size

$$n = \frac{P \frac{(1 - P)}{Z^2} \left\{ A^2 + \frac{P(1 - P)}{N} \right\}}{R}$$

Where

$n$  = sample size required

$N$  = Expected Accessible population (in our case the population of Nairobi County is estimated to be 3,995, 000 in 2016)

$P$  = estimated variance in the population, taken in form of decimal: (0.5 for 50-50)

$A$  = desired precision, expressed as a decimal (0.1 for 10%)

$Z$  = based on confidence level: 1.96 for 95percentconfidence,

$R$  = estimated response rate, as a decimal (0.7)

When the above formula is employed, the sample size is estimated to be 137. In order of taking in to consideration the potential non-response, and spoilt questionnaires, the sample size was scaled up by 66 percent. The sample size of this study was therefore 209.

### APPENDIX III

**Table 3.1 Nairobi County population per Region/District**

Region/District	Population (2015 KNBS statistical abstracts)	Total number of households	Sample
Nairobi West	684,765	212,295	45
Nairobi East	1,144,416	369,866	78
Nairobi North	1,062,086	327,428	69
Westland's	247,102	75,427	16
<b>TOTAL</b>	<b>3,995,000</b>	<b>98,5016</b>	<b>209</b>

## APPENDIX IV

### Service Providers' Transaction Costs

**Table 3.2 Withdrawal from M-PESA Agent**

Min(KSHs.)	Max(KSHs.)	M-PESA Charges
1	49	N/A
50	100	10
101	500	27
501	1,000	27
1,001	1,500	27
1,501	2,500	27
2,501	3,500	49
3,501	5,000	66
5,001	7,500	82
7,501	10,000	110
10,001	15,000	159
15,001	20,000	176
20,001	25,000	187
25,001	30,000	187
30,001	35,000	187
35,001	40,000	275
40,001	45,000	275
45,001	50,000	275
50,001	70,000	330

Source: <https://www.safaricom.co.ke/personal/m-pesa/getting-started/m-pesa-rates>

**Table 3.3 Transfer to Unregistered Users**

Min(KSHs.)	Max(KSHs.)	M-PESA Charges
1	49	N/A
50	100	N/A
101	500	44
501	1,000	48
1,001	1,500	58
1,501	2,500	73
2,501	3,500	110
3,501	5,000	132
5,001	7,500	163
7,501	10,000	201
10,001	15,000	260
15,001	20,000	282
20,001	25,000	303
25,001	30,000	303
30,001	35,000	303
35,001	40,000	N/A
40,001	45,000	N/A
45,001	50,000	N/A
50,001	70,000	N/A

Source: <https://www.safaricom.co.ke/personal/m-pesa/getting-started/m-pesa-rates>



**Table 3.4 Transfer to other M-PESA Users**

Min(KSHs.)	Max(KSHs.)	M-PESA Charges
1	49	<b>Free</b>
50	100	<b>Free</b>
101	500	11
501	1,000	15
1,001	1,500	25
1,501	2,500	40
2,501	3,500	55
3,501	5,000	60
5,001	7,500	75
7,501	10,000	85
10,001	15,000	95
15,001	20,000	100
20,001	25,000	110
25,001	30,000	110
30,001	35,000	110
35,001	40,000	110
40,001	45,000	110
45,001	50,000	110
50,001	70,000	110

Source: <https://www.safaricom.co.ke/personal/m-pesa/getting-started/m-pesa-rates>

**Table 3.5 Equitel Money Tariffs**

Transaction Range (Kshs)	Send To Equitel/Orange Money (Kshs)	Send To Airtel Money /Mpesa (Includes Airtel/Mpesa Charges)		
		Charges by Equitel (Tax Incl)(Kshs)	Charges by other Networks (Tax Incl) (Kshs)	Total Charge (Kshs)
50 - 100	0	1.1	33	34.1
101 - 500	0	5.5	33	38.5
501 - 1000	0	11	33	44
1,001 - 1,500	0	16.5	33	49.5
1,501 - 35,000	0	27.5	33	60.5

Source: <https://www.equitel.com/my-money/rates>

**Table 3.7 Airtel Money Tariffs**

Min(Ksh)	Max(Ksh)	Transfer to other Airtel Money users	Transfer to Unregistered users	Withdrawal charges from Airtel Money agent
50	100	0	0	10
101	2,500	0	0	27
2,501	3,500	0	0	49
3,501	5,000	0	0	66
5,001	7,500	0	0	82
7,501	10,000	0	0	110
10,001	15,000	0	0	159
15,001	20,000	0	0	176
20,001	35,000	0	0	187
35,001	50,000	0	0	275
50,001	70,000	0	0	330

Source:

[http://africa.airtel.com/wps/wcm/connect/AfricaRevamp/Kenya/Airtel\\_Money/Home/Personal/AirtelMoney\\_tariffs](http://africa.airtel.com/wps/wcm/connect/AfricaRevamp/Kenya/Airtel_Money/Home/Personal/AirtelMoney_tariffs)

**Table 3.8 Orange Money Tariffs**

TRANSACTION TYPE	RANGE		CHARGE
	Min	Max	
Orange Money Registration	N/A	N/A	<b>Free</b>
Orange Money Debit Card Application	N/A	N/A	400
Send And Withdrawal Money			
Cash Deposit	100	100,000	<b>Free</b>
Buy airtime(For self or other)	10	10,000	<b>Free</b>
Send Money to a registered Orange Money User	100	35000	30
	35,001	50,000	40
	50,001	100,000	50
Withdrawal by a registered Orange Money User	100	2,500	25
	2,501	5,000	45
	5,001	10,000	75
	10,001	20,000	145
	20,001	35,000	170
	35,001	50,000	195
	50,001	100,000	225
Send Money to a non-registered Orange Money User	100	2,500	70
	2,501	5,000	90
	5,001	10,000	155
	10,001	20,000	305
	20,001	35,000	355
	35,001	50,000	390
	50,001	100,000	450
Withdrawal by a non-registered user	100	100,000	<b>Free</b>
ATM Withdrawal by a registered Orange Money user	100	2,500	40
	2,501	5,000	60
	5,001	10,000	100
	10,001	40,000	175

APPENDIX V

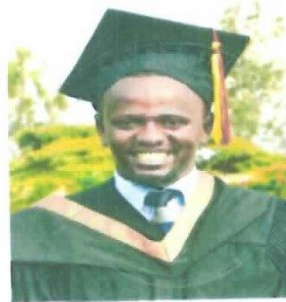
RESEARCH PERMIT

THIS IS TO CERTIFY THAT:  
**MR. JOHN NJUGUNA MBUGUA**  
of KENYATTA UNIVERSITY, 8246-300  
NAIROBI, has been permitted to conduct  
research in *Nairobi County*

Permit No : NACOSTI/P/18/98695/22218  
Date Of Issue : 24th April, 2018  
Fee Received : Ksh 1000

on the topic: **HOUSEHOLD CHOICE OF  
MOBILE MONEY TRANSFER SERVICE  
PROVIDERS: CASE OF NAIROBI COUNTY,  
KENYA.**

for the period ending:  
24th April, 2019



  
.....  
Applicant's  
Signature

  
.....  
Director General  
National Commission for Science,  
Technology & Innovation

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