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# IMPACT OF MTN MOBILE MONEY SERVICES ON DEEPENING THE RWANDAN FINANCIAL INCLUSION. A CASE STUDY OF: NKOMBO SECTOR IN RUSIZI DISTRICT.

**BY**

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF POST GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ACCOUNTING AND FINANCE UNIVERSITY OF KIGALI**

**OCTOBER 2022**

# DECLARATION

This dissertation is my original work, and it has not been submitted for any other degree award university.

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# APPROVAL

This dissertation has been submitted to the School of Postgraduate Studies for examination with my approval as a university supervisor.

Signature..... Date.....

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Thank you all.

# DEDICATION

This research is dedicated to the future researchers, to the university of Kigali, to my wonderful mother and to my GOD.

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# LIST OF ABBREVIATIONS AND ACRONYMS

AFR: ACCESS TO FINANCE RWANDA

CVI: Content validity index

FINTECH: Financial technology

GoR: government of Rwanda

GSMA: Global System for Mobile Communications

MoMo: mobile money

SACCOs: Savings and Credit Co-operatives

SIM-CARD: Subscriber Identity Module or Subscriber Identification Module.

SPSS: Statistical Package for Social Sciences

TELECOMS: Telecommunication company

USSD: Unstructured Supplementary Service Data

## OPERATIONAL DEFINITION OF KEY TERMS

**Financial inclusion**: the process of enabling vulnerable groups, such as the weaker parts and low-income groups, timely access to financial services and appropriate credit where needed at a reasonable price

**Interoperability:** The capability for users of several mobile money systems to do direct transactions with one another. No mobile money platform is yet fully interoperable with another due to the technical, strategic, and regulatory challenges that enabling such transactions would provide. The ability to transmit money to non-users is offered by several mobile money firms, nevertheless (they receive the transfer in cash from an agent)

**Mobile money:** a service that allows access to financial services through a mobile device.

**Mobile money transfer:** a transfer of money made via a mobile phone that originates with the phone, accrues to the phone, and/or is made from the phone

**Mokash service:** a service that gives customers the chance to save and borrow money.

**Remittance:** is a low-value, cross-border payment from one individual to another. The payments are often ongoing transfers made by migrant employees to their family members back home.

# ABSTRACT

This study examined the impact of MTN mobile money services and how it deepens financial inclusion at Nkombo sector, Rusizi district. The study objectives used in this study were money transfer, mokash, interoperability and remittance services. Financial inclusion was measured using two benchmarks: access and quality. Based on the AFR (2020), in their recent FinScope 2020 report, it was reported that The Rwandan adult population is largely rural based, with 74% (5.2 million) residing in rural areas, where banks and other financial service providers are reluctant to deploy deposit taking banking infrastructure, can mobile money therefore, in such situations, be used as an alternative of banks? Through the findings, it was seen that, first of all, the research instrument was reliable with a Cronbach's alpha of 0.928. the researcher noticed an important factor whereby transaction fees were indicated as the greatest hindrances to accessing financial services at Nkombo, it was closely followed by the eminent lack of awareness for mobile money products and services which reveals that there is a huge untapped potential to financial inclusion if product awareness was taken into account! As a matter of fact, Remittance services was found to be the lowest relative contributor to financial inclusion ($\beta = 0.096$), followed by mokash services ($\beta = 0.225$) the regression model for mobile money services showed that the regression was fairly fit with an $R^2$=0.524, showing that there was a change of 52.4% in Nkombo sector financial inclusion as result of variations in money transfer, mokash, interoperability and remittance services, this also means that the remaining 47.6% variation in financial inclusion at Nkombo sector, would be explained by other variables not captured in this research. Based on the findings of this research, The researcher recommends that financial literacy should be emphasized to equip the Nkombo population with the skills to use mobile money services. The researcher concluded that mobile money services do have an impact on deepening the Rwandan financial inclusion agenda at Nkombo sector which was supported by the rejection of all null hypothesis of the research as their p value were less than 0.05 ($p<0.05$) respectively.

# CHAPTER ONE

# GENERAL INTRODUCTION

## 1.0 Introduction

This chapter presents the background to the study, statement of the problem, objectives of the study, hypothesis of the research, scope of the study and significance of the study.

## 1.1 Background of The Study

In research from Demirgüç-Kunt *et al*. (2017), they reported in their global Findex survey that globally, about 1.7 billion adults remain unbanked—without an account at a financial institution or through a mobile money provider. Almost all of these unbanked people reside in poor countries because account ownership is almost universal in high-income economies. In fact, only seven developing nations—Bangladesh, China, India, Indonesia, Mexico, Nigeria, and Pakistan—represent about half of the global population. From their quest to know the reason behind those unbanked population, most offered two reasons. The most frequent one was not having enough money to operate an account. Two-thirds of respondents gave this as a reason—and almost a fifth gave it as the only justification—for not having a bank account. About 25% of respondents cited cost and distance as reasons, and a comparable percentage stated they do not have an account because a family member already has one. About one-fifth of adults without a financial institution account claimed a lack of documents, while 6% expressed mistrust of the financial system and 6% mentioned religious issues. (Demirgüç-Kunt *et al*., 2017)

Based on the 2017 Global Findex database, provided by Demirgüç-Kunt *et al*. (2017) it was shown that between 2014 and 2017, 515 million adults globally opened a bank or mobile money account. This translates to a current adult account ownership rate of 69%, up from 62% in 2014 and 51% in 2011. Adults in high-income economies have an account to the tune of 94%, compared to only 63% in underdeveloped nations. It was also reported that development can be accelerated by financial services. They assist people in escaping poverty by encouraging investments in their well-being, education, and companies. Additionally, they help manage monetary crises that might drive families into poverty, like job losses or crop failures. however, bank accounts and electronic payments are two examples of the financial services that many

poor people around the world lack. They rely on cash instead, which can be risky and challenging to handle.

Companies pay wages in cash to about 230 million unbanked adults worldwide; switching to electronic payrolls could help these workers join the formal financial system. Contrary to the rest of the world, only in Sub-Saharan Africa do adults have a higher than 10% MoMo account penetration rate. The region's mobile money hub used to be in East Africa, but now mobile money accounts have extended to new regions throughout Sub-Saharan Africa. In Côte d'Ivoire, Senegal, and Gabon, the proportion of adults with a mobile money account has now topped 30% and 40%, respectively. (Demirgüç-Kunt *et al*., 2017).

According to Access to Finance Rwanda (2020), It is generally agreed that one of the core drivers to an inclusive economy is the inclusion of most of the population in the formal economy. Hence, the importance of a more financially included adult population is vital as it gives rise to financial stability as more funds are channeled and flow in the formal economy, this allows for a more effective monetary stimulus while helping reduce costs of conducting financial transactions and increase oversight among other reasons. The ultimate aim of policies and strategies for financial inclusion is to increase access to formal financial institutions and increase uptake and usage of formal financial products and services.



**1.2 Statement of The Problem**

According to Varghese, G., & Viswanathan, L. (2018), Financial inclusion is the process of ensuring that vulnerable groups, such as the weaker parts and low-income groups of the society, have timely access to financial services and appropriate credit when needed at a reasonable price.

The BNR figure below highlights several stages our country went through such as the emergency period, the rebuilding of financial sector, the financial inclusion foundation laying and lastly the financial inclusion deepening from 2012 to date. Fortunately, Rwanda managed to achieve sustainable growth through those various financial inclusion stages: from 48% in 2008 to 72% in 2012, an outstanding 50% growth, then it moved to 89% in 2016, which was a 23.6% growth within just 4 years, and finally 93% of Rwandan adults are financially included as per the 2020 FinScope survey, which was approximately a 4.5% growth. However, the GoR has a target to increase the proportion of financial inclusion to 100% by 2024 and priority

should be given to policies that broaden and deepen financial inclusion, given the critical role that it plays in the national agenda. (AFR, 2020).


*Figure 1:Rwanda financial inclusion journey, source: (BNR,2016)*

Based on the AFR (2020), in their recent FinScope 2020 report, it was reported that The Rwandan adult population is largely rural based, with 74% (5.2 million) residing in rural areas, where banks and other financial service providers are reluctant to deploy deposit taking banking infrastructure (i.e., branches, and two-way ATMs) as intensively as they might need to in order to service poor clients' greater deposit needs since the revenue these clients generate does not justify the investment. In fact, given their low balances and the high transaction costs of traditional banking infrastructure, even clients who do not require intensive deposit services (such as those who might receive direct government transfers or military pensions) are rarely viewed by banks as profitable customers (Kendall *et al*., 2011), can mobile money therefore, in such situations, be used as an alternative of banks? And if so, can it impactfully satisfy the financial inclusion definition in respect to the Nkombo population needs or be used to meet the desired 100% financial inclusion by 2024?

### 1.3 Research Objectives

The study's objectives are categorized as general and specific objectives as shown below:

#### 1.3.1 General Objective

The general objective of this project is to find the impact of MTN mobile money services on deepening the Rwandan financial inclusion agenda at Nkombo sector, Rusizi, Rwanda.

#### 1.3.2 Specific Objective

i. To assess the impact of Money transfer service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda.
ii. To examine the impact of mokash service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda.
iii. To analyze the impact of interoperability service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda.
iv. To examine the impact of remittance service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda.



### 1.4 Hypothesis of The Study

The Research employed null hypotheses

$H_0$1: Money transfer service has no significant impact on deepening Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda.

$H_0$2: Mokash service has no significant impact on deepening Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda.

$H_0$3: Interoperability service has no significant impact on deepening Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda.

$H_0$4: Remittance service has no significant impact on deepening Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda.

### 1.5 Scope of The Study

The scope of this research was geographical scope, content scope, and time scope

### 1.5.1 Geographical Scope

Geographically, the research was conducted in a remote and distant island, separated from the mainland in the Western province, Rusizi district, Nkombo sector.

### 1.5.2 Methodological Scope

Regarding methodological scope, the research was based on primary data. The research used a regression analysis to test the hypothesis of the research.

### 1.5.3 Content Scope

In content scope, the research was in domain of mobile money services and Rwanda financial inclusion at Nkombo sector.

### 1.5.4 Time Scope

For the time scope, the research was conducted for the period of nine months.

## 1.6 Significance of The Study

The study is significant to the following stakeholders:

### 1.6.1 To the Researcher

The researcher benefited from this noble task as he gained in depth knowledge about financial inclusion and the impact of fintech innovations such as mobile money towards the fulfilment of inclusive finance.

### 1.6.2 To the University of Kigali

the research will be put in the library and serve as an empirical review for the future researchers in the field of financial inclusion.

### 1.6.3 To the Financial Policy Makers and Momo Fintech Team

The findings of this paper can be used by the government policy makers, stakeholders, Access to finance Rwanda (AFR), to improve the enabling environment for greater inclusion. On the other hand, it would help MTN mobile money department and financial institutions in Rwanda to come up with useful and efficient financial inclusion strategies by innovating versatile services and building better products portfolio.

### 1.6.4 To Rusizi District

The findings will give an excellent bird's-eye view of the city's financial inclusion status and thereby help the district decision makers to come up with initiatives to boost a greater financial inclusion in their city.

# CHAPTER TWO

# LITTERATURE REVIEW

## 2.1 Introduction

This chapter contains a critical examination of the existing relevant literature on mobile money services and financial inclusion. The theoretical literature, empirical literature, conceptual framework, and the research gap are also presented.

## 2.2 Conceptual Review

This study reviewed empirical literature in relation of mobile money services and financial inclusion. For this study, the variables of mobile money services were reviewed in relation to money transfer services, mokash services, interoperability services and remittance service.

Mobile money is a form of financial technology innovation that enables financial transactions through mobile devices. it is highly regarded as an essential game changer in deepening financial inclusion. However, in Africa, most mobile money services are not provided in indigenous dialects but in formal languages such as English and French, hence a difficulty for some local illiterate or semi-literates to easily use the technology. For some of these reasons, there are still a large number of people, especially in developing countries, who do not have access to financial services. To address such social imbalances, there is a need to understand antecedents of mobile money use to enable service providers to redesign their services to foster wider acceptance and use to deepen financial inclusion. (P. Senyo & Osabutey, 2020)

Until recently, banking services were only offered by traditional financial institutions, including micro savings and lending service providers… (Senyo *et al*., 2020). Due to telecoms' lack of independent financial institution licenses and inability to keep funds in the same manner, they now perform the primary job of custodians of funds transacted on mobile money networks in addition to providing their main banking services. Each telecom, for instance, is required to have a partner bank that receives and holds deposits in eFunds for protection. (P. K. Senyo *et al*., 2021)

P. Senyo and Osabutey (2020), reported that in the traditional financial industry, access to monetary products and services are mostly obtained through banks and other financial firms.

However, in the contemporary setting, technology is enabling non-financial institutions such as telecoms firms to provide financial services. In research from Senyo *et al*. (2021) it was reported that through their mobile network infrastructure, telecoms offer mobile money services. Similar to much of Africa, telecoms serve a crucial bridging function in Ghana by giving people a way to access financial services. To supply mobile money-based financial services, FinTech firms and banks work with the telecoms which frequently create and provide financial services and are essential to mobile money services. Similar to how telecoms, despite having few physical locations, have more access points thanks to their affiliations with mobile money agents therefore basic mobile phone may be sufficient to gain access to mobile money accounts and other financial services. (Demirgüç-Kunt *et al*., 2020)

### 2.2.1 Financial Inclusion

Having basic formal financial services readily available and accessible to all members of the population is known as financial inclusion. Financial inclusion refers to the availability to both individuals and enterprises of formal financial services that are beneficial, affordable, and capable of meeting their needs in an ethical and sustainable manner. (Ozili, 2020).

In research from P.K. Senyo *et al*. (2021), it was revealed that financial inclusion is shaped by two prominent and interconnected activities. First, innovative financial services are offered by FinTech companies, telecoms, and banks to replace or improve on existing services. Second, in doing so, actors reconfigure their relationships and adopt new collaborative models to deliver their innovations. Besides, Financial services can help drive development by encouraging investments in people's well-being, education, and companies, they assist people in escaping poverty and they make it easier to manage financial emergencies such as a job loss or crop failure that can push families into destitution and in research from Demirgüç-Kunt *et al*. (2020) it was shown that a rising corpus of research demonstrates numerous potential benefits for development from financial inclusion, particularly when using digital financial services like mobile money services, payment cards, and other fintech applications.

Access indicators comprise of population per branch (Ravikumar,2020), or interoperability, in our case the branch will be represented by MoMo agents in the area. Quality indicators have parameters like grievance redressal, financial literacy, down time of services. (GPFI,2012). In this research, supply side financial inclusion indicators access and quality were used. By giving

underprivileged and vulnerable groups of the population a chance to join in the formal financial system, financial inclusion reduces economic inequality and fosters economic growth. Financial inclusion is a key enabler in the fight towards poverty eradication and fostering the economic growth. (Shylaja & Prasad, 2018)

### 2.2.2 MTN Mobile Money Services

According to Access to Finance Rwanda (2020), about 87% that's 6.2 million adults in Rwanda have access to a mobile phone with females at 84% having lower access compared to men at 90%. Around 3 in 5 meaning 61% adults use mobile money and more males at 68% have mobile money accounts as compared to women at 56%. There are agents nationwide who facilitates operation, those MoMo Agents are actors, contextually specific to developing countries in the delivery of financial services. Agents in Ghana are tiny businesses, typically one person operations that serve as cash-in, cash-out locations or shadow bank branches and offer digital financial services such cash deposits, withdrawals, mobile money transfers, airtime sales, and mobile money registrations. (P. K. Senyo *et al*., 2021)

Almost 75% totaling to 5.3 million individuals of adults in Rwanda use other formal non-bank financial products/services. The proportion of adults that have/use other formal non-bank financial products/services ranges from 98% in Gasabo district to 53% in Burera, the other formal non-bank institution usage is mostly driven by mobile money accounts. (AFR, 2020)

The Main Features of Mobile Money are as follows: Customers can withdraw and deposit money through a network of transaction agents operating outside the banking system. Customers can make transactions on their mobile devices using an interface or an app. It uses a mobile phone for transferring funds between banks/accounts, deposit/withdrawal of money, or makes bills payments. It is an electronic wallet service that allows users to store, send, and receive data using their mobile phones. Since mobile money is a safe and secure way to make electronic payments, it is a widely accepted alternative to bank accounts. It uses smartphones and basic feature phones. (Purohit, 2020)

### 2.2.3 Money Transfer Service

Money transfer is an act of transferring money from one place to another. Basically, money transfer is a financial service, which involves the acceptance of cash, cheques, or other

monetary instruments on the one side, and the payment of a corresponding sum of cash or other forms of credit to a beneficiary on the other side (Corselli, 2020). Although mobile money is frequently referred to as a money transfer product, it was stated that when it reaches scale, it may also be considered as a network infrastructure and platform that facilitates the exchange of cash and electronic value between numerous economic actors, including customers, businesses, the government, and financial service providers. (Kendall *et al*. 2011). Around 3.2 million, or 45% of Rwandan adults, either sent and/or received money. Formal channels are the most common mechanism used to transfer money and mobile money is the most common mechanism used at around 42% of all adults. (AFR, 2020)

According to the MTN simcard menu, by dialing the USSD MoMo code *182# and selecting the first option of transfer, various options are displayed, and the user can choose any service that suits his needs.

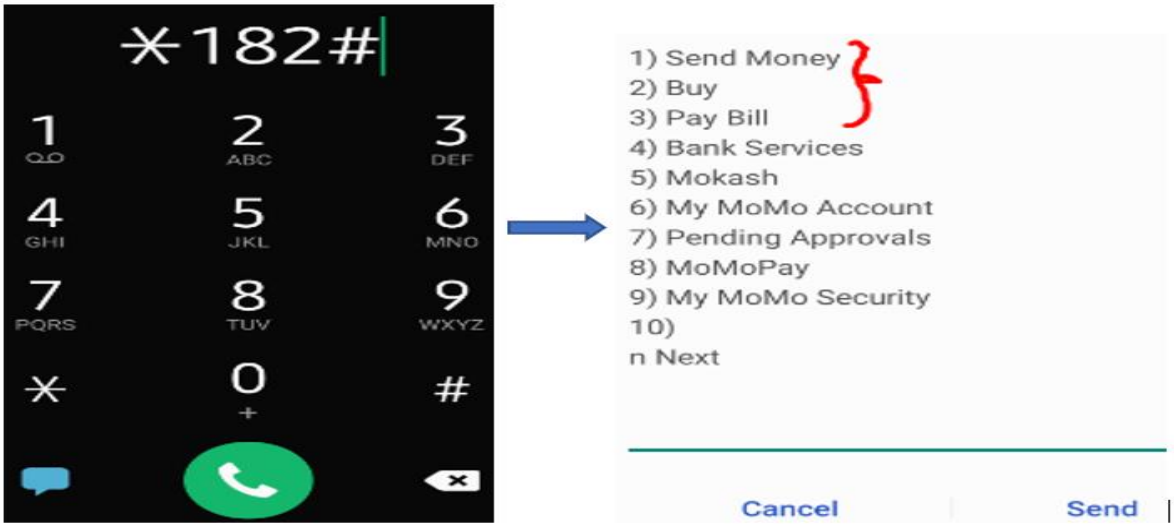



*Figure 2: send, buy, and pay options. source: (researcher compilation, 2022)*

### 2.2.4 Mokash Service

Mokash is a service which offer credit and saving opportunity to users. Savings are the leading product type and one of the main drivers for financial inclusion for the entire Rwanda and this is encouraging as savings are the doorway to enabling adults to create wealth, pay for household furniture and equipment and most importantly, enabling adults to use savings as collateral for accessing credit. About 76%, that is 5.4 million of adults in Rwanda borrow money, including all forms of borrowing. Same as saving uptake, there has been an impressive

increase in formal credit consumption, however, formal credit remains low at 22%. Formal borrowings in Rwanda are driven by borrowing from mobile money at 9% penetration. (AFR, 2020)

In research from Kendall et al. (2011), it was disclosed that here are a number of fundamental challenges to reaching the poor with financial services that have blocked market growth in the past. Perhaps the key challenge is that the vast majority of the poor lives in a cash economy and is paid in cash. In developed economies, banks usually receive clients' salaries via direct deposit and the money can be moved to longer term savings. In developing economies, the poor lose the natural connection to the financial system which stems from not having income born in electronic form. To make matters worse, the poor often make money unpredictably and would need to deposit frequently whenever small windfalls come their way. For this reason, MTN MoMo agents are spread all over the country, so that they can act as deposit taking agent and facilitate the poor people to save their unsteady earnings.

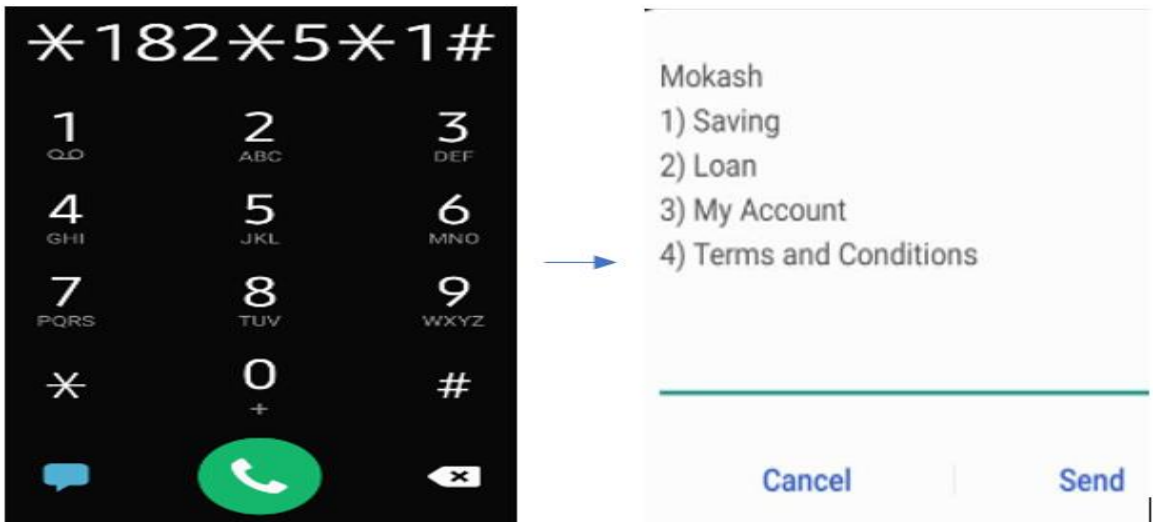



*Figure 3: saving and loan option. source:(researcher compilation, 2022)*

### 2.2.5 Interoperability Service

Interoperability can be defined as easy transfer of money between bank accounts and mobile money wallets (Acquah-Sam & Bugre, 2018), Interoperability is the ability for different systems to work together seamlessly, (e.g., transfer from MTN mobile money to Airtel money, or from mobile money to bank) creating interoperability requires improving connectivity, facilitating discussions, and design alignment among very different entities, Interoperability

means going beyond those entities in finance and payments, to enabling all stakeholders to interact with each other. It involves bringing together the power of multiple technology ecosystems like Apple, Amazon, Google and more, in order to integrate data ecosystems, regulatory ecosystems as well as financial ecosystems (Dargahwala & Riedl, 2021). FinTech companies enable electronic payment, seamless interoperability between actors, and integration of electronic payments through mobile phones into many products and services. Mobile money is one example of a fintech invention that works in an ecosystem of diverse actors who cooperate and compete to accomplish a shared goal. As a result, users can now conduct financial transactions digitally. (P. K. Senyo *et al*., 2021), mobile money, a FinTech innovation that enables financial transactions without a bank account (Senyo et al., 2020) has deeply permeated Sub-Saharan Africa's financial landscape, including banks. It was observed that increased deposit availability could be a way for banks involved in mobile money to operate better. (Byukusenge, 2021).

According to findings from research done by Byukusenge (2021), financial innovation, such as mobile money facilitates the access to bank accounts, helps to reduce costs leading to cost savings for example, I&M Bank has a partnership with telecoms companies such as MTN Rwanda, TigoAirtel Rwanda for the benefit of its customers to improve access to financial services, which is done through push and pull.

### 2.2.6 Remittance Service

Remittances are characterized as low-value, cross-border payments made from one person to another. The payments are often ongoing transfers made by migrant employees to their family members back home. (GPFI 2015). Remittances are first and foremost a private flow of funds between family members. According to Access to Finance Rwanda (2020), adults around 3.2 million, in Rwanda indicated that they have remitted money sent and/or received money in the six months prior to FinScope Rwanda 2020, including all forms of remittances. This is up from 2.3 million in 2016. The results show that for those who remit, the most reported means of remitting is through formal remittance products at 43%. Remittances are believed to help households smooth out their income flows and even to fund small enterprises. Contextually, remittances involve the sending or receiving of money from one person to another via a medium which can be made within the country or beyond the national borders. Through the

same study, it was revealed that most adults in Rwanda who receive money from their loved ones, use it chiefly for meeting daily expenses like buying food, clothes, medicine, and paying for school fees. Encouragingly, about 15% of the adults use the money to start a business or for investment purposes. This trend indicates the significance of remittances in supporting the vulnerable.

The significance of remittances, as reported by Adeseye (2021) lies inside the position they play on the receiving economies, as they aid the poor households to fulfill their primary needs, facilitate investments, motivate new businesses, finance education, pay off money owed and additionally promote the increase of the economic system.

### 2.3 Theoretical Review

In research from Ozili (2020), he concluded that first, we need a theory of financial inclusion to achieve a high level of synthesis between financial inclusion objectives and financial inclusion outcomes. Theoretical explanations of financial inclusion's goals, procedures, and results could be provided by a theory or group of theories. (Ozili, 2020)

Secondly, recent idealistic disputes in the policy literature on financial inclusion can be consolidated by financial inclusion theories. Thirdly, theories of financial inclusion can offer a foundation of principles upon which the practice of financial inclusion is built. These theories also enable the identification of anomalous patterns in the practice of financial inclusion, which would prompt additional study to clarify the reasons for unanticipated deviations in practice. (Ozili, 2020)

#### 2.3.1 Vulnerable Group Theory

According to the vulnerable group theory, a nation's financial inclusion initiatives or programs ought to concentrate on helping the most vulnerable members of society—including the poor, children, women, and the elderly—because they are the ones who suffer the most from economic hardship and crises. It makes sense to include vulnerable people in the official financial sector because they are frequently the ones who are most impacted by financial crises and economic downturns. The following are some benefits of the vulnerable group theory: Targeting vulnerable groups helps to address the issue of financial exclusion; it is simple to identify those who are financially excluded in society; and it is economical to solely focus on

these groups. Its drawbacks include the fact that it does not emphasize financial inclusion for everyone in the population, excludes nonvulnerable persons outside of the formal financial sector, and presupposes that only women are a vulnerable group, which implies that men are not a vulnerable group. (Ozili, 2020)

### 2.3.2 Dissatisfaction theory of financial inclusion

The dissatisfaction theory of financial inclusion argues that financial inclusion activities and programs in a country should first be targeted to all individuals who were previously on-boarded into the formal financial sector but left the formal financial sector because they were dissatisfied with the rules of engagement in the formal financial sector or had other unfavorable personal experiences from dealing with firms and agents in the formal financial sector. This theory suggests that it is easier to bring back people who left the formal financial sector because they were dissatisfied if the areas of dissatisfaction in the formal financial sectors have been completely resolved (Ozili, 2020)

### 2.3.3 Financial Literacy Theory



According to the financial literacy theory, financial inclusion should be accomplished through giving citizens more financial literacy through education. According to this notion, people will be more inclined to engage in the formal financial sector if they are financially literate. The benefits of financial literacy include raising people's awareness of accessible basic financial services, assisting them in achieving some level of financial stability, and helping them become self-sufficient. Governments with limited public funding may decide to employ financial literacy as a national strategy for financial inclusion because it doesn't require a lot of funding from the general public. The financial literacy approach addresses willingness rather than ability to engage in the formal financial sector, which is a drawback. (Ozili, 2020)

## 2.4 Empirical Review

### 2.4.1 Money Transfer Service and Financial Inclusion

This includes peer-to-peer money transfers, which allow people to send money in under a minute to others in remote corners of the country without the need for a bank account. Mobile money services serve as stand-ins for regular banking services geared toward the unbanked; the mobile phone serves as the transactional medium and the mobile money account serves as

the bank account. Cash is converted to eFunds that are kept in a mobile money account instead of being deposited. Banking services, such as fund transfers, are being supplanted by peer-to-peer mobile money transactions. Mobile money is a tool used by individuals and organizations to carry out financial operations such money transfers, bill and school fee payments, buying phone credit and data bundles, and depositing money. Mobile payments are therefore gradually replacing cash transactions. (P. K. Senyo *et al*., 2021)

Banks and other financial service providers are reluctant to deploy deposit taking banking infrastructure (i.e., branches, and two-way ATMs) as intensively as they might need to in order to service poor clients' greater deposit needs since the revenue these clients generate does not justify the investment. In fact, given their low balances and the high transaction costs of traditional banking infrastructure, even clients who do not require intensive deposit services (such as those who might receive direct government transfers or military pensions) are rarely viewed by banks as profitable customers (Kendall *et al*., 2011). In the case of MTN mobile money, they deploy MoMo agents who are contextually actors specific to developing countries in the delivery of financial services. Agents are tiny businesses in Ghana, usually consisting of a single person, that operate as cash-in and cash-out terminals or shadow bank branches and offer digital financial services such cash deposits and withdrawals, mobile money transfers, airtime sales, and mobile money registrations. (Senyo *et al*., 2021)

Financial inclusion can provide a variety of advantages. For instance, studies have indicated that mobile money services, which enable users to store and transfer monies through a mobile phone, can assist enhance people's income generating capacity and hence reduce poverty, according to a study conducted in Kenya, women in particular benefited greatly from having access to mobile money services. It allowed 185,000 women to quit farming and start businesses or retail ventures, helped reduce extreme poverty among women-headed households by 22%, and allowed them to boost their savings by more than a fifth. (Demirgüç-Kunt *et al*., 2020)

### 2.4.2 Mokash Service and Financial Inclusion

A study from Demirgüç-Kunt *et al*. (2020) revealed that financial services can also encourage saving and enhance spending on essentials. Market vendors in Kenya, mostly women, saved more and increased their investments in their enterprises by 60% after receiving savings

accounts. Mokash is a service whereby customers opt in and start savings and later they can also request for loans, the money is transferred from their momo wallet to mokash account, they can also withdraw from mokash to their momo wallet. The financial inclusion field's excitement for mobile money is driven by the possibility of providers offering savings, credit, insurance, and other products to the poor at low cost (Kendall *et al*., 2011).

In research from Senyo *et al*. (2021) Due to the lack of banks in most areas and the difficulty in obtaining the necessary papers, unbanked persons were previously unable to obtain small loans from banks. As opposed to banks, a user of mobile microloans services can apply for a loan using their phone, and within a short time, they will have the funds in their mobile money account. Using mobile money, we make it possible for banks to establish relationships with traditional Susu organizations. These Susu organizations can establish a credit history on which banks can make microloans available. For example, due to documentation and collateral requirements as well as impassable bank branches, the unbanked historically were unable to get small loans from traditional banks. With mobile money, however, residents of distant communities may use their phones to apply for microloans in less than five minutes without having to go to a physical bank or provide any security. Obtaining credit, saving money and managing financial risk are all critical components of financial inclusion.

### 2.4.3 Interoperability Services and Financial Inclusion

integrating with mobile money increases the density of access points and the reach of access points in new areas, transforming the geographical distribution of delivery channels. Many financial service providers cite the lower cost in time and money for clients who want to make payments and deposits or receive insurance payments, withdrawals, or loan disbursements. Smaller institutions in particular lack widespread distribution networks some have only a single branch and thus can benefit from plugging into a ubiquitous, low-cost retail delivery channel. Some institutions also report that the existing ATM network is not well situated for the poor. For example, Nayndarua Teachers Sacco notes that ATMs are clustered around wealthier and urban areas far away from their low income and rural clientele. Therefore, institutions integrating to existing products and those launching new ones frequently cite increased outreach and lower costs, especially in reaching poor clients, as a motivation for adopting the mobile money platform (Kendall et al., 2011).

Financial institutions should assist in strengthening mobile service interoperability from mobile money service providers, as the platform will allow customers who use mobile money services to transfer money from different service providers.(Acquah-Sam & Bugre, 2018) Interoperable systems reward us with many positive outcomes, FinTech companies, telecoms companies and banks could see increases in efficiency, usage, cost-savings through shared infrastructure, economies of scale and innovation. The end users could receive the benefits of increased market competition, network effects and reduced transaction fees. according to the World Bank and the current experience of the payment processing companies, like VISA and Mastercard, has proven that interoperability dramatically improves the user experience of making payments and therefore contributes to a huge increase in transactions. (Dargahwala & Riedl, 2021) Interoperability would give mobile money service providers the opportunity to increase the volume of digital transactions, improve the sustainability of mobile money services and contribute to an open digital financial ecosystem which promotes financial inclusion. (Mustafa & Sifat, 2017).

### 2.4.4 Remittance Service and Financial Inclusion

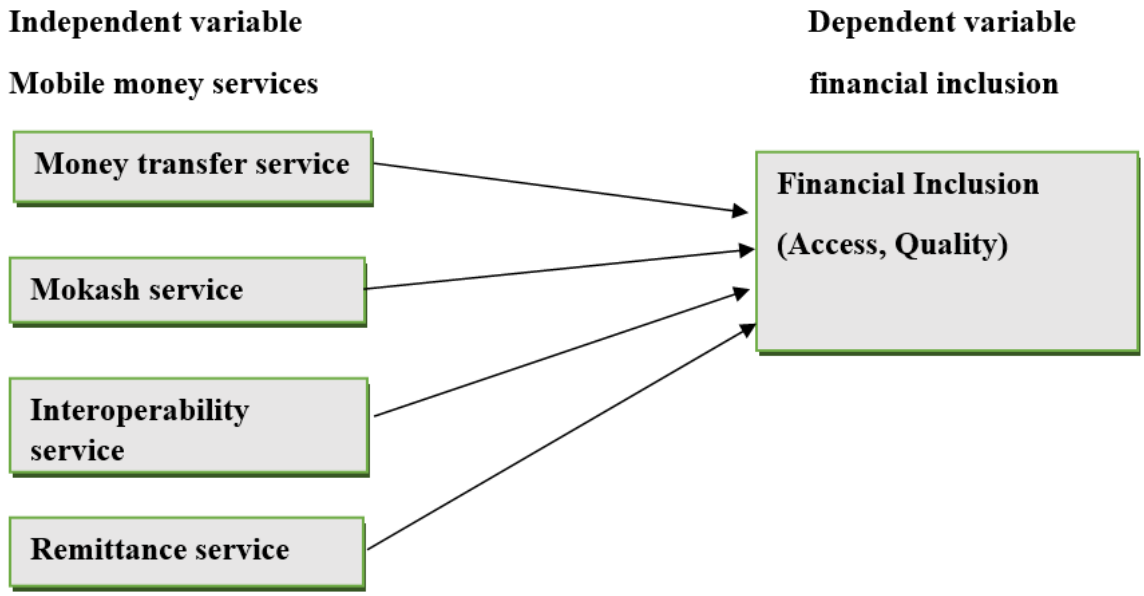
Mobile money services have rapidly expanded across emerging and developing economies and enabled new ways through which households and firms can conduct payments, save, and send remittances. Risk sharing was reported as one of the benefits mainly to rural households and informal sector firms from the use of remittances and payments (Patnam & Yao, 2020).

In his paper relating to migrants, Varghese, and Viswanathan (2018) reported that the establishment of remittance corridors for the migrant population represents a huge opportunity for migrants from rural areas to use simple and inexpensive remittance services. Migrants are currently underserved and are having difficulty opening bank accounts. Remittances transferred by migrant workers, represent a huge percentage of countries' foreign exchange earnings and GDP growth, contribute significantly to the economic improvement of migrant families (Muhammad et al., 2019). In addition, mobile money platform provides real-time remittance transactions and feedback (including instant SMS receipts), it can help build trust and promote savings and repayment behavior (Kendall et al., 2011). Remittances are expected to increase formal financial access and inclusion when unbanked recipient households deposit their money in the financial sector and utilize the wealth of financial services provided by

formal institutions. Remittances are more likely to promote financial development if they are converted into loanable funds for the private sector via financial intermediaries. (Inoue & Hamori, 2016)

### 2.5 Conceptual Framework

Below is a visual representation of the relationship between independent and dependent variables.




Source: (research compilation, 2022)

The conceptual framework of this research is comprised by independent variables which are money transfer services, mokash service, interoperability services and remittance service. It also presents the dependent variable which is financial inclusion measured via access, and quality.

### 2.6 Research Gap

Financial inclusion is the major tool for achieving inclusive growth, a prerequisite for economic development, for the inclusive development of the society (Gourav, 2019) however, based on the AFR (2020), in their recent FinScope 2020 report, it was reported that The Rwandan adult population is largely rural based, with 74% (5.2 million) residing in rural areas, whereby financial institution are reluctant to open branches due to the population unsteady income and familiarity with the cash based economy yet the government of Rwanda has an

agenda of being 100% financially inclusive by 2024 (AFR, 2020). Comprising both urban and rural.

Previously, there have been several financial inclusion studies on a national scale, however the independent variables differs from mine, among those were: commercial banks (Bigirimana & Hongyi, 2018), tax revenue (Oz-Yalaman (2019), one paper examined the financial inclusion strategies on performance of commercial banks in Rwanda (Byukusenge, 2021), some other research was done on the role of umurenge sacco on financial inclusion (AFI, 2014), some other studies focused on the use of MoMo to tea sacco plantation (Mercyline W. Kamande *et al*., 2021). Maniriho (2021) focused on the motivation of using mobile money, Goodwin (2021), focused on the effect of decentralization on financial inclusion, whereas Kim (2020) focused on the role of mobile money on poor people living in big cities like Nairobi, further researchers have concentrated on various aspects of financial inclusion for example Pavón Cuéllar (2018) focused only on the access index, Md Ali Ashraf (2022) focused only on the usage index of financial inclusion. However, from the reviewed literature, particularly concerning Rwanda, there is an apparent lack of research on how mobile money contribute to geographically excluded people, living in remote and distant areas such as Nkombo island in Rusizi district, where bank infrastructure is scarce, and banks are reluctant to open branches. This study thus focused on the impact of MTN mobile money services on deepening the Rwandan financial inclusion agenda, to remote population as Nkombo island. The explanatory variables being money transfer, mokash services, interoperability services, and remittance services. This research is trying to check if there is any impact from MoMo services by deepening financial inclusion gap in that area, in terms of access to financial services and the quality of financial services.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter focuses on the study's design, sample size, data collection method, empirical model, data analysis and ethical considerations employed by the researcher.

## 3.2 Research Design

A research design is the setting up of parameters for data collection and analysis in a way that aims to combine relevance to the research goal with economy of procedure. In actuality, the research design serves as the conceptual framework for the study and serves as the manual for data collection, measurement, and analysis. (Kothari, 2004)

Surveys and fact-finding investigations of various kinds are included in descriptive research. The key characteristic of this method is that the researcher has no control over the variables; he can only report what has happened or what is happening. The basic objective of descriptive research is to describe the condition of affairs as they currently exist. (Kothari, 2004); Therefore, the type of research adopted in this study was descriptive in nature, it was deemed appropriate because it sought to analyze the fact that financial inclusion is being deepened through MoMo services. The independent variable was mobile money services while the dependent variable was financial inclusion.

## 3.3 Study Population

Majid, U. (2018) stated that the population of interest is the study's target population that it intends to study or treat, however it is often not appropriate or feasible to recruit the entire population of interest, instead, investigators will recruit a sample from the population of interest to include in their study. In such cases, the objective of the research study is to generalize the study findings from the sample to the population of interest. The total subscriber number of MoMo users at Nkombo sector, as provided by the MTN western regional manager is 2,246.

### 3.4 Sample Size Determination

A sample is a subset of the population, selected so as to be representative of the larger population, in any research study, the best strategy is to investigate the problem in the whole population. But practically, it is not always possible to study the entire population. Alternatively, we study a "sample" which is sufficiently large and representative of the entire population (Acharya et al., 2013)

According to Tejada and Punzalan (2012), Sample size can be determined using sloven's formula $n = N / (1 + Ne^2)$ Where: n = sample size, N= Total population and e = margin of error. The researcher used the following data: N=2,246 MoMo subscribers; confidence level=95% thus e =1- 0.95 = 0.05

$$n = \frac{2246}{1 + 2246(0.05)2}$$

$$n = \frac{2246}{6.56}$$

$$\mathrm{n} = 342$$

the sample size was 342 mobile money users from Nkombo island/Rusizi district.

#### 3.4.1 sampling technique

Kothari (2014) defines sampling design/technique as a definite plan for obtaining a sample from the sampling frame. The researcher used simple random sampling techniques.

### 3.5 Nature of Data

In this research, primary data was used. According to Hox and Boeije (2005). Primary data are data that are connected for the specific research problem at hand, using procedures that fit the research problem best. on every occasion that primary data are collected, new data are added to the existing store of social knowledge. According to Kothari (2004) Primary data can be collected either through experiment or through survey.

### 3.6 Data Collection Instruments

A structured questionnaire was used to obtain the data for this study.

#### 3.6.1 Questionnaire

So far as the general form of a questionnaire is concerned, it can either be structured or unstructured questionnaire. Structured questionnaires are ones with specific, measurable, and pre-determined questions. Each respondent receives the same set of questions, all of which are presented in the same format and sequence. A highly organized questionnaire limits the number of comments made in the respondent's own words and specifies all of the questions and possible answers. A questionnaire is referred to as unstructured or non-structured when these elements are absent from it. (Kothari, 2004)

Likert scales are made up of a number of statements that convey a respondent's favorable or unfavorable view toward the provided thing. Each statement in the instrument is accompanied with the respondent's agreement or disagreement. To gauge the respondent's attitude, each response is given a numerical score that indicates how favorable or unfavorable it is. In other words, the total rating reflects where a person falls on the scale of how favorable or unfavorable, they are toward a certain subject. (Kothari, 2004)

The questionnaire used in this research consists of 3 sections: Demographics, MoMo services knowledge, financial inclusion opinion, the last 2 sections were measured using Likert scale.

### 3.7 Validity, Reliability and Pilot Study

#### 3.7.1 Validity and Reliability of Instruments

Research from Kothari (2004) stated that Validity refers to the extent to which a test measures what we wish to measure. The most important criterion, validity, describes how closely an instrument measures what it is intended to assess. Utility is another word for validity. To put it another way, the degree to which differences detected by a measuring tool accurately represent those under test. The validity of this research was assessed using content validity index (CVI) which according to Kothari (2004) is the extent to which a measuring instrument provides adequate coverage of the topic under study. The content validity is good if the instrument has a representative sample of the entire universe. It makes decisions mostly using judgment and intuition, for this research it was measured through the opinion of experts

especially the research supervisor, who is knowledgeable and tested during the pilot study. Any ambiguity or non-clarity was cleared before the field for data collection.

According to Kothari (2004), the accuracy and precision of a measurement technique are related to reliability, which is another crucial requirement for accurate measurement. If a measurement instrument yields repeatable results, it is reliable. The reliability of my research was tested by using internal consistency technique. Internal consistency uses one instrument administered only once. The coefficient alpha (or Cronbach's alpha) is used to assess the internal consistency of the item. A value of around 0.70 or greater is widely considered desirable. Cronbach was concerned with having a measure of reliability for a test or instrument which could be obtained from a single administration given the practical difficulties (referred to earlier) in obtaining test-retest data (Kothari, 2004). In this study, the Cronbach's alpha statistics was 0.928, showing that the instrument was reliable for use.

**Table 3.1: Reliability Statistics Using Cronbach's alpha**

| Cronbach's Alpha | N of Items |
|---|---|
| .928 | 42 |

Source: (research compilation, 2022)

### 3.7.2 Pilot Study

In research from Ronald E. Mocorro. (2017), a pilot study is a brief study that is carried out ahead of a planned project in order to evaluate particular components of the research design and to allow for necessary adjustments before the design is finalized. Similar to full-scale studies, which are also referred to as feasibility studies, pilot studies are described as a scaled-down version of those studies. It also refers to the process of pre-testing research instruments like questionnaires, tests, and interview schedules. The pilot study was done at Nkombo sector by the help of both the civil state and social affairs workers of Nkombo sector, Alongside MTN employees in that region.

### 3.8 Data Processing

Following collecting, the data must be processed and analyzed in accordance with the guidelines established for the purpose of creating the research plan. This is crucial for a scientific investigation and for ensuring that we have all the pertinent information for the

comparisons and analyses we intend to make. Processing, in a technical sense, refers to the editing, coding, classification, and tabulation of collected data to make them suitable for analysis (Kothari, 2004), the data collected was analyzed using Statistical Package for Social Sciences (SPSS), version 28.0.1, which is a computer software for processing, editing and analysis data.

### 3.8.1 Editing

In order to identify errors and omissions and, where possible, correct them, the raw data that has been obtained is edited. This is especially important when conducting surveys. In fact, editing entails a thorough examination of the completed questionnaires and/or schedules. Editing is carried out to ensure the data are correct, compatible with other information acquired, uniformly input, as thorough as possible, and well-arranged to make coding and tabulation easier. (Kothari, 2004)

### 3.8.2 Coding

Coding is the process of assigning numbers or other symbols to replies in order to categorize or classify them. Such classifications should be relevant to the study subject at hand. Coding is essential for effective analysis because it allows the numerous responses to be condensed into a small number of classes that each contain the essential data. Coding considerations should normally be made during the questionnaire design stage. (Kothari, 2004)

### 3.8.3 Classification

In order to find meaningful associations, we must compress the volume of raw data generated by the majority of research investigations into homogeneous groups. This fact calls for data categorization, which is the process of grouping data into classes or groups based on shared features. Data with a common characteristic are grouped in one class, dividing the total data into various groups or classes as a result. (Kothari, 2004)

### 3.8.4 Tabulation

The researcher must organize a large amount of data in a clear and logical order once it has been gathered. Tabulation is the term used to describe this process. Thus, tabulation is the process of condensing raw data for further analysis and presenting it in a concise format (i.e., in the form of statistical tables). Tabulation, in a wide sense, is the systematic grouping of data

into columns and rows. (Kothari, 2004)

### 3.9 Data Analysis

As per Kothari (2004), The term "analysis" refers to the process of computing various indices or measures as well as looking for relationships between the groups of data. Analysis entails estimating population parameter values that are unknown and testing hypotheses in order to derive conclusions, especially when using survey or experimental data. As a result, analysis might be classified as descriptive or inferential (Inferential analysis is often known as statistical analysis). in this research, first, descriptive statistics was used to check the mean and the standard deviation. Second, inferential statistics was used to determine the correlation and regression between the study variables.

#### 3.9.1 Descriptive Statistics

The main focus of descriptive analysis is the examination of distributions of a single variable; this type of analysis is sometimes referred to as unidimensional analysis, bivariate analysis, or multivariate analysis when it involves more than two variables. (Kothari, 2004)

The most common measure of central tendency is the mean, often referred to as the arithmetic average, which may be calculated by dividing the sum of the values of all the items in a series by the number of items. Its main utility is to summarize a series' key characteristics and make data comparison possible. In contrast, the standard deviation is the most extensively used indicator of a series' degree of dispersion and is frequently represented by the symbol " σ". When deviations are calculated from the arithmetic average for the values of individual items in a series, the standard deviation is the square-root of the average of the squares of deviations. The standard deviation, which is mostly utilized in research investigations, is thought to be a very accurate indicator of dispersion in a series. Since the algebraic signs are taken into account when computing, it is subject to mathematical manipulation. The effects of sampling fluctuations are less pronounced. Because of these benefits, standard deviation and its coefficient are used frequently to determine how dispersed a series is. It is frequently employed when estimating and testing hypotheses. (Kothari, 2004)

Below is the interpretation of Coefficients

$1.0 \leq \mu \leq 1.8$ : Very low mean i.e the fact is not apparent

$1.9 \leq \mu \leq 2.6$ : Low mean i.e the fact appears less

$2.7 \leq \mu \leq 3.4$: Neutrality

$3.5 \leq \mu \leq 4.2$ : High mean i.e the fact appears more

$4.3 \leq \mu \leq 5.0$: Very high mean i.e strong fact

$\sigma \leq 0.5$ i. e homogeneity of responses

$\sigma > 0.5$ i. e heterogeneity of responses

**3.9.2 Inferential Statistics**

Forming a data base from which to infer demographic features or associations is the goal of the inferential approach to research. This typically refers to survey research, when features of a sample of the population are examined (asked about or observed) in order to draw conclusions about the characteristics of the entire population. Inferential analysis focuses on the numerous significance tests for testing hypotheses to ascertain the degree of validity with which evidence can be used to support a conclusion or series of conclusions. Estimating population values is another issue it addresses. The act of interpretation, or the task of generating inferences and conclusions, is mostly dependent on inferential analysis. (Kothari, 2004)

Does a relationship or correlation exist between the two or more variables? If so, to what extent? This is addressed using the correlation methodology; according to Kothari (2004), the Karl Pearson's coefficient of correlation is the most popular way to assess the strength of a relationship between two variables. This coefficient is predicated on: (i) that the two variables have a linear relationship; (ii) that the two variables are casually coupled, which means that one variable is independent, and the other is dependent; and (iii) that numerous independent causes operate in both variables to form a normal distribution. The examination of the association is known as multiple correlation when there are two or more independent variables, and the equation defining the relationship is known as the multiple regression equation. The examination of the association is known as multiple correlation when there are two or more

independent variables, and the equation defining the relationship is known as the multiple regression equation. We here explain multiple correlation and regression taking four independent variables and one dependent variable. (Kothari, 2004)

The regression model is as follows:

$Y= \beta\alpha+\beta_1X_1+ \beta_2X_2+ \beta_3X_3 + \beta_4X_4+ę$

Where:

$\beta\alpha$= Constant

$\beta_1$- $\beta_4$= Coefficient of estimates.

$X_1$= money transfer service

$X_2$= mokash service

$X_3$= interoperability service

$X_4$= remittance service

e= Error term

Y= Financial inclusion as measured via access, and quality



**3.10 Ethical Considerations**

Ethical review is to be certain how the personal information of the participants should be kept carefully (Sermsri, 2014). In this research ethics such voluntary participation, informed consent, anonymity, confidentiality, potential harm is hedged against, avoiding plagiarism, and the UoK research guidelines for postgraduate's program was adhered to.

# CHAPTER FOUR

# DATA ANALYSIS, FINDINGS, AND INTERPRETATION

## 4.1 Introduction

This chapter presents the research findings which are also discussed in line to the specific objectives that guided this study. The main data collection tool was questionnaire.

## 4.2 Response rate

**Table 4.1: Response Rate**

| | Frequency | Percent |
|---|---|---|
| Returned | 342 | 100 |
| Not Returned | 0 | 0 |
| **Total** | **342** | **100** |

Source: Researcher, (2022)

As shown in Table 4.1, out of the 342 distributed questionnaires, 342 were filled and returned, which represented 100% response rate, this confidently enabled the researcher to continue with the data analysis.



## 4.3 Demographic information

This section presents the findings obtained from the field.

### 4.3.1 Background Information

The researcher started off by outlining the study's participants. It is important for a researcher to describe the demographic characteristics of the participants in his/her research. This provides a general picture of the participants as well as giving information whether the participants are a representation of the population the researcher intended in the study (Lee & Schuele, 2010). In this regard, the demographic characteristics in this study are present here which include profession, education level, marital status, and gender of the participants.

**Table 4.2: Profession of the Participants**

| Profession | Frequency | Percent |
|---|---|---|
| Fishing | 41 | 12.0 |
| government worker | 17 | 5.0 |
| Teacher | 38 | 11.1 |
| Farmer | 72 | 21.1 |
| Jobless | 174 | 50.9 |
| Total | 342 | 100.0 |

Source: Researcher, (2022)

Table 4.2 presents the general description of the participants in this study. 50.9% of the participants indicated they were jobless, 21.1% were farmers, 12% were in the fishing profession, 11.1% were teachers while the government workers were 5%. The fact that Nkombo sector is geographically isolated (an island) hinders investors or any other would-be income generator to start their operations to that island due to their visible lack of infrastructure, poverty, etc… being secluded and isolated geographically results in a bigger portion of the population to become jobless. (Yao, 2016)

**Table 4.3: Education Level of Participants**

| Education Level | Frequency | Percent |
|---|---|---|
| Illiterate | 133 | 38.9 |
| primary school | 109 | 31.9 |
| secondary school | 89 | 26.0 |
| Bachelor's degree | 10 | 2.9 |
| master's degree | 1 | .3 |
| **Total** | **342** | **100.0** |

Source: Researcher, (2022)

Table 4.3 on the education level, 38.9% of the participants had no formal education followed closely by 31.9% who indicated primary education. Only 26% of the participants had secondary school education level, those with a bachelor's level were at 2.9% and only 0.3% had a master's level. This can be explained by the above fact of joblessness, as poverty prevails few people gets the chance to go to school and without the necessary education, it is hard to find a decent work, which then creates a cycle (Wolbers, 2000)

**Table 4.4: Marital Status of the participants**

| Status | Frequency | Percent |
|---|---|---|
| Single | 161 | 47.1 |
| Married | 166 | 48.5 |
| Divorced | 15 | 4.4 |
| **Total** | **342** | **100.0** |

Source: Researcher, (2022)

Table 4.4 regards marital status where 48.5% of the participants were married while 47.1% indicated they were single, with a very low rate of divorcee at only 4.4%, This indicated that participants involved in this research were fairly distributed by marital status, which would give us a good idea of the impact of MoMo services to both singles and married couples.

**Table 4.5: Gender of the Respondents**

| Gender | Frequency | Percent |
|---|---|---|
| Male | 217 | 63.5 |
| Female | 125 | 36.5 |
| Total | 342 | 100.0 |

Source: (research compilation, 2022)

Out of all the total participants in this study, 63.5% were male and only 36.5% were female.

### 4.4 Descriptive statistics

#### 4.4.1 Descriptive Statistics for Money transfer services

The first specific objective sought to assess the impact of Money transfer service towards the deepening of financial inclusion at Nkombo, Rusizi, Rwanda. Money transfer services are used by individuals and organizations to carry out financial operations such as bill and school fee payments, buying phone credit, data bundles, and depositing money. (P. K. Senyo *et al*., 2021)

**Table 4.6: Respondents' views on Money Transfer Services**

| Statement | SD | | D | | N | | A | | SA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | N | % | n | % | n | % | n | % | M | Std |
| 1.I can receive any amount of money, anytime and anywhere | 13 | 3.8% | 7 | 2.0% | 14 | 4.1% | 64 | 18.7% | 244 | 71.3% | 4.52 | .96 |
| 2.I can easily deposit or withdraw money due to being at close proximity with MoMo agents | 20 | 5.8% | 11 | 3.2% | 12 | 3.5% | 59 | 17.3% | 240 | 70.2% | 4.43 | 1.10 |
| 3.The transfer and withdraw fees are fair and affordable to me | 76 | 22.2% | 54 | 15.8% | 35 | 10.2% | 43 | 12.6% | 134 | 39.2% | 3.31 | 1.63 |
| 4.Money transfer menu is understandable due to being displayed in my local language | 30 | 8.8% | 14 | 4.1% | 36 | 10.5% | 53 | 15.5% | 209 | 61.1% | 4.16 | 1.28 |
| 5.In case i make any wrong money transfer i get quick support | 46 | 13.5% | 52 | 15.2% | 35 | 10.2% | 62 | 18.1% | 147 | 43.0% | 3.62 | 1.49 |
| 6.There's no daily limit to the amount of money i am allowed transfer | 33 | 9.6% | 26 | 7.6% | 33 | 9.6% | 71 | 20.8% | 179 | 52.3% | 3.99 | 1.34 |
| 7.Money transfer services remains operational 24/7 | 26 | 7.6% | 15 | 4.4% | 41 | 12.0% | 81 | 23.7% | 179 | 52.3% | 4.09 | 1.23 |
| 8.The cost to open a money transfer account is fair and affordable to me | 29 | 8.5% | 23 | 6.7% | 39 | 11.4% | 40 | 11.7% | 211 | 61.7% | 4.11 | 1.33 |
| 9.I am well aware of the rules and regulations that governs money transfer services | 50 | 14.6% | 34 | 9.9% | 53 | 15.5% | 53 | 15.5% | 152 | 44.4% | 3.65 | 1.48 |
| 10.In case of any money transfer related issue, I know how, where and to whom I would address it | 34 | 9.9% | 34 | 9.9% | 37 | 10.8% | 61 | 17.8% | 176 | 51.5% | 3.91 | 1.38 |
| **Overall** | | | | | | | | | | | **3.98** | **1.32** |

***SD=strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree, M=mean, std=standard deviation***

Source: (research compilation, 2022)

Table 4.6 shows the respondents' views on money transfer services. On whether the respondents receive any amount of money, anytime and anywhere, the mean score was 4.52 (std=0.96) showing that most of the respondents were in agreement with the statement. The mean score on the statement that the respondents can easily deposit or withdraw money due to being at close proximity with MoMo agents was 4.43 (std=1.1). This indicated that majority of the respondents were in agreement though their views were divergent as shown by a large standard deviation of 1.1. On whether the transfer and withdraw fees are fair and affordable to

respondents, a total of 51.8% of the respondents agreed while 10.2% were neutral and the remaining 38% disagreed. This gave a mean score of 3.31(std=1.63) which indicated that majority were neutral about the fairness of the transfer and withdrawal fees.

On whether money transfer menu is understandable due to being displayed in the local language, the mean score obtained was 4.16(std 1.28) which indicated that there was high divergence in the views of the respondents. However, the mean score was high, showing that most of the respondents were in agreement. When asked to indicate their agreement on the statement that MTN provides quick support services in case of any wrong money transfer, a mean score of 3.62(std=1.49) was obtained. This indicated that the responses were just slightly above the neutral, implying slight level of agreement. On whether there is no daily limit to the amount of money transfer, a total of 73.1% of the respondents agreed while 16.2% disagreed, giving a mean score of 3.99 and a high standard deviation of 1.34.

On the statement that Money transfer services remain operational 24/7, a high mean score of 4.09(std=1.23) was an indication that majority agreed to the statement. On whether the cost to open a money transfer account is fair and affordable to the respondents, a mean score of 4.11 with a high standard deviation of 1.33 indicated that the majority of the respondents were in agreement though giving divergent views in the process. On whether the respondents are well aware of the rules and regulations that governs money transfer services, a total of 59.9% of the respondents agreed while 24.5% disagreed, giving low mean score of 3.65 with high divergence (std=1.38). This showed that most respondents had diverging views but on average with low level of agreement. On whether in the respondents know how, where and who to address in cases of any money transfer related issue, a mean score of 3.91(std=1.38) showed that majority agreed to the statement. The overall mean score for money transfer services was 3.98(std=1.3) which indicated that though respondents had diverging views in relation to money transfer as in ease of use, affordability, and rules and regulations awareness; the mean indicated that on average, the respondents were in agreement by 3.98.

### 4.4.2 Descriptive statistics for Mokash Services

The second objective sought to examine the impact of mokash service towards the deepening of financial inclusion at Nkombo, Rusizi, Rwanda.

**Table 4.7: Respondents' views on Mokash Services**

| Statement | SD | | D | | N | | A | | SA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | N | % | n | % | n | % | n | % | M | Std |
| 1.Mokash services gives me access to save funds and withdraw them | 34 | 9.9% | 38 | 11.1% | 142 | 41.5% | 42 | 12.3% | 86 | 25.1% | 3.32 | 1.24 |
| 2.I am allowed to access Mokash loans as a MoMo user | 35 | 10.2% | 34 | 9.9% | 158 | 46.2% | 46 | 13.5% | 69 | 20.2% | 3.23 | 1.18 |
| 3.The interest rate to mokash loans is fair to me | 51 | 14.9% | 44 | 12.9% | 158 | 46.2% | 37 | 10.8% | 52 | 15.2% | 2.99 | 1.20 |
| 4.Opening and using mokash services is easy and understandable to me | 26 | 7.6% | 42 | 12.3% | 165 | 48.2% | 40 | 11.7% | 69 | 20.2% | 3.25 | 1.14 |
| 5.Mokash services remains operational 24/7 | 30 | 8.8% | 45 | 13.2% | 159 | 46.5% | 47 | 13.7% | 61 | 17.8% | 3.19 | 1.14 |
| 6.No collateral is required to get a mokash loan | 27 | 7.9% | 30 | 8.8% | 160 | 46.8% | 54 | 15.8% | 71 | 20.8% | 3.33 | 1.14 |
| 7.The process to get a mokash loan is easy | 37 | 10.8% | 42 | 12.3% | 161 | 47.1% | 44 | 12.9% | 58 | 17.0% | 3.13 | 1.16 |
| 8.Due to mokash i no longer save under the mattress | 30 | 8.8% | 24 | 7.0% | 152 | 44.4% | 57 | 16.7% | 79 | 23.1% | 3.38 | 1.17 |
| 9.I am well aware of the rules and regulations that governs mokash services | 39 | 11.4% | 47 | 13.7% | 150 | 43.9% | 36 | 10.5% | 70 | 20.5% | 3.15 | 1.23 |
| 10.In case of any mokash related issue, I know how, where and to whom I would address it | 58 | 17.0% | 46 | 13.5% | 151 | 44.2% | 19 | 5.6% | 68 | 19.9% | 2.98 | 1.29 |
| **Overall** | | | | | | | | | | | **3.20** | **1.19** |

***SD=strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree, M=mean, std=standard deviation***

Source: (research compilation, 2022)

Table 4.7 provides the descriptive statistics in relation to mokash services provided by MTN Rwanda. On whether mokash services give the respondents access to save funds and withdraw them, only 37.4% of the respondents agreed, which is also shown by a low mean score of 3.32 and a high standard deviation of 1.24. On whether the respondents are allowed to access Mokash loans as a MoMo user, the mean score was 3.23(std=1.18), indicating majority were

neutral on this issue. On whether the interest rate to mokash loans is fair to the respondents, a low mean score of 2.99(std=1.20) was obtained showing majority were neutral on the interest charges by MTN mokash services. On whether opening and using mokash services is easy and understandable, the mean score was 3.25(std=1.14) indicating low level of agreement among the respondents. On whether Mokash services remains operational 24/7, majority of the respondents were neutral as indicated by a mean score of 3.19(std=1.14).

On whether there are any collateral requirements to get a mokash loan, 46.5% of the respondents were neutral, resulting to a low mean score of 3.19(1.14). This indicated that most of these respondents were neutral or not concerned about the mokash and collateral requirements. Similarly, when asked whether the process of getting a mokash loan is easy, 46.8% of the respondents were neutral. This is also shown by a low mean score of 3.13(std=1.16). On whether due to mokash, the respondents no longer save under the mattress, a low mean of 3.38(std=1.17) which indicated there was low level of agreement among the respondents. Asked about whether they are well aware of the rules and regulations that governs mokash services, 43.9% of the respondents said they were neutral, as supported by a mean score of 3.5(std=1.23). On whether the respondents know how, where and who to address in case of any mokash related issue, 44.2% indicated neutral. This is further confirmed by a mean score of 2.98(std=1.29). The overall mean score for mokash services provided by MTN Rwanda was 3.20(std=1.19) which indicated that there were divergent views among the respondents in relation to mokash services ease of use, affordability, and respondents' awareness. The mean score indicated that on average, the respondents were in neutral about the use and accessibility of mokash services.

### 4.4.3 Descriptive statistics for Interoperability Services

The third objective in this study endeavored to analyze the impact of interoperability service towards the deepening of financial inclusion at Nkombo, Rusizi, Rwanda.

**Table 4.8: Respondents' views on Interoperability Services**

| Statement | SD | | D | | N | | A | | SA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | N | % | n | % | n | % | M | Std |
| 1.MoMo and AIRTEL interoperate thus i can send money to airtel | 14 | 4.1% | 45 | 13.2% | 96 | 28.1% | 55 | 16.1% | 132 | 38.6% | 3.72 | 1.22 |
| 2.MoMo and AIRTEL interoperate thus i can receive money from airtel | 16 | 4.7% | 47 | 13.7% | 99 | 28.9% | 57 | 16.7% | 123 | 36.0% | 3.65 | 1.23 |
| 3.MoMo and banks interoperate thus i can push money to my bank account | 16 | 4.7% | 37 | 10.8% | 103 | 30.1% | 59 | 17.3% | 127 | 37.1% | 3.71 | 1.20 |
| 4.MoMo and banks interoperate thus i can pull money from my bank account | 20 | 5.8% | 38 | 11.1% | 94 | 27.5% | 59 | 17.3% | 131 | 38.3% | 3.71 | 1.25 |
| 5.The transaction fees for interoperability operations are fair and affordable to me | 63 | 18.4% | 66 | 19.3% | 104 | 30.4% | 41 | 12.0% | 68 | 19.9% | 2.96 | 1.36 |
| 6.Interoperability services remains operational 24/7 | 24 | 7.0% | 46 | 13.5% | 117 | 34.2% | 57 | 16.7% | 98 | 28.7% | 3.46 | 1.23 |
| 7.I no longer go to queue on the bank due to Interoperability services | 10 | 2.9% | 40 | 11.7% | 93 | 27.2% | 54 | 15.8% | 145 | 42.4% | 3.83 | 1.18 |
| 8.Due to interoperability services, I am enabled to make payments on several platforms using my MoMo | 14 | 4.1% | 42 | 12.3% | 90 | 26.3% | 49 | 14.3% | 147 | 43.0% | 3.80 | 1.23 |
| 9.I am well aware of the rules and regulations that governs interoperability services | 39 | 11.4% | 51 | 14.9% | 117 | 34.2% | 42 | 12.3% | 93 | 27.2% | 3.29 | 1.32 |
| 10.In case of any interoperability issue, I know how, where and to whom I would address it | 28 | 8.2% | 58 | 17.0% | 101 | 29.5% | 48 | 14.0% | 107 | 31.3% | 3.43 | 1.31 |
| **Overall** | | | | | | | | | | | **3.56** | **1.25** |

***SD=strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree, M=mean, std=standard deviation***

Source: (research compilation, 2022)

Table 4.8 shows the respondents' views obtained in this study with regards to interoperability

services provided by MTN Rwanda. On whether MoMo and AIRTEL interoperate thus the respondents can send money to airtel, 38.6% strongly agreed and 16.1% agreed to the statement. This gave a mean score of 3.72(std=1.22) indicating that the majority of the respondents were in agreement, though with divergent views on the subject. On whether MoMo and AIRTEL interoperate thus the respondents can receive money from airtel, a mean score of 3.65(std=1.23) indicated the responses were slightly above neutral with a bigger divergency in views. On whether MoMo and banks interoperate thus the respondents can push money to their bank account, a total of 54.4% of the respondents agreed and a mean score of 3.71(std=1.20) an indication of agreement among the respondents. On whether MoMo and banks interoperate thus the respondents can pull money from my bank account, a mean score of 3.71(std=1.25) also indicated gave similar understanding that majority of the respondents were in agreement with the statement.

On whether Mobile money is interoperable with banks and other financial services, a low mean scored of 2.96(std=1.36) indicated the responses were neutral and providing high divergence since the standard deviation was high. Asked to indicate their views on the statement that transaction fees for interoperability operations are fair and affordable to the respondents, a mean score of 3.46(std=1.23) showed that majority of the respondents were neutral about this. Majority of the respondents also indicated that agreement about interoperability services being operational 24/7, as indicated by a mean score pf 3.83(std=1.18). On whether the respondents are enabled to make payments on several platforms using MTN MoMo due to interoperability services, a total of 57.3% agreed to the statement giving a mean score of 3.80(std=1.23). On whether the respondents are well aware of the rules and regulations that governs interoperability services, a mean score of 3.29(std=1.32) showed that majority were neutral about this. When asked to indicate their level of agreement on whether the respondents know how, where and to who to address in case of issues related to interoperability, a mean score of 3.43(std=1.31) indicated low level of agreement among the respondents. The overall mean score in relation interoperability services as provided by MTN Rwanda was 3.56(std=1.25) which was an indication that the majority of the respondents were just slightly in agreement though with high level of standard deviation.

### 4.4.4 Descriptive statistics for Remittance Services

*T*he fourth specific objective sought to examine the impact of remittance service towards the deepening of financial inclusion at Nkombo, Rusizi, Rwanda.

**Table 4.9: Respondents' views on remittance services**

| Statements | SD | | D | | N | | A | | SA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | M | Std |
| 1.I am able to remit money abroad using MoMo | 9 | 2.6% | 27 | 7.9% | 79 | 23.1% | 64 | 18.7% | 163 | 47.7% | 4.01 | 1.12 |
| 2.I am able to receive money from abroad on my MoMo wallet | 10 | 2.9% | 22 | 6.4% | 80 | 23.4% | 67 | 19.6% | 163 | 47.7% | 4.03 | 1.11 |
| 3.The remittance services menu is understandable and easy to use | 22 | 6.4% | 40 | 11.7% | 88 | 25.7% | 65 | 19.0% | 127 | 37.1% | 3.69 | 1.26 |
| 4.Remittance services remains operational 24/7 | 25 | 7.3% | 44 | 12.9% | 99 | 28.9% | 52 | 15.2% | 122 | 35.7% | 3.59 | 1.29 |
| 5.Remittance fees are fair and affordable to me | 54 | 15.8% | 55 | 16.1% | 92 | 26.9% | 40 | 11.7% | 101 | 29.5% | 3.23 | 1.43 |
| 6.There is no capping on the amount i can remit using MoMo | 52 | 15.2% | 36 | 10.5% | 93 | 27.2% | 41 | 12.0% | 120 | 35.1% | 3.41 | 1.44 |
| 7.Remittance menu includes all the countries I would wish to send money to | 42 | 12.3% | 35 | 10.3% | 96 | 28.2% | 51 | 15.0% | 117 | 34.3% | 3.49 | 1.37 |
| 8.I am well aware of the rules and regulation of MoMo Remittance | 47 | 13.7% | 51 | 14.9% | 88 | 25.7% | 51 | 14.9% | 105 | 30.7% | 3.34 | 1.40 |
| **Overall** | | | | | | | | | | | **3.58** | **1.23** |

***SD=strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree, M=mean, std=standard deviation***

Source: (research compilation, 2022)

Table 4.9 shows the respondents' views on the remittance services as provided by MTN Rwanda. On whether the respondents are able to remit money abroad using MoMo, a total of 66.4% of the respondents agreed to the statement. This gave a high mean score of

4.01(std=1.12) indicating that majority of the respondents were in agreement. On whether the respondents are able to receive money from abroad on their MoMo wallet, 67.3% agreed to the statement. The mean score in this case was 4.03(std=1.11). On whether the remittance services menu is understandable and easy to use, a mean score of 3.69(std=1.26) was an indication of agreement among the respondents though with high divergence. On whether remittance services remain operational 24/7, a mean of 3.59(std=1.29) indicated the responses were just slightly above the neutral level.

On whether remittance fees are fair and affordable to the respondents, 26.9% of the respondents indicated they were neutral. The mean score of 3.23(std=1.43) affirmed this neutrality. On whether there is no capping on the amount the respondents can remit using MoMo, 47.1% of the respondents which was below the median agreed to the statement. This therefore gave a mean of 3.41(std=1.44) indicating that the responses were showing neutrality to the issues to do with capping amount. On whether remittance menu includes all the countries the respondents would wish to send money to, a mean score of 3.49(std=1.37) showed that majority of the respondents were on the neutral. It also showed that the respondents gave very divergence views. Similar results were obtained for the last two statements where majority of the respondents expressed neutrality. For the statement that the respondents were well aware of the rules and regulations of MoMo Remittance, the mean score was 3.34(std=1.40). For the last statement that the respondents know how, where and to who they would address on issues related to remittance, the mean score was 3.40(std=1.43). The overall mean score of 3.58(std=1.23) indicted that most of the respondents were just slightly on agreement though they provided divergent views on the issues to do with remittance services as provided by MTN Rwanda.

### 4.4.5 Descriptive Statistics for Financial Inclusion

**Table 4.10: Respondents' views on Financial Inclusion**

| Statements | SD | | D | | N | | A | | SA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | n | % | M | Std |
| Mobile money services have impact on the increased access of financial service at Nkombo | 25 | 7.3% | 10 | 2.9% | 50 | 14.6% | 53 | 15.5% | 204 | 59.6% | 4.17 | 1.22 |
| Mobile money services have impact on the desired/increased quality of financial services offered at Nkombo | 24 | 7.0% | 20 | 5.8% | 53 | 15.5% | 57 | 16.7% | 188 | 55.0% | 4.07 | 1.25 |
| There is a significant relationship between mobile money services and financial inclusion | 25 | 7.3% | 29 | 8.5% | 50 | 14.6% | 60 | 17.5% | 178 | 52.0% | 3.99 | 1.29 |
| **Overall Mean** | | | | | | | | | | | **4.08** | **1.25** |

***SD=strongly disagree, D=disagree, N=neutral, A=agree, SA=strongly agree, M=mean, std=standard deviation***

Source: (research compilation, 2022)

Table 4.10 shows the respondents' views on financial inclusion. On whether Mobile money services have impact on the increased access of financial service at Nkombo, 59.6% of the respondents strongly agreed and 15.5% agreed, giving a total of 75.1% of those in agreement. The mean score was high at 4.17(std=1.22) indicating high level of agreement. On whether the mobile money services have impact on the desired/increased quality of financial services offered at Nkombo, a total of 71.7% agreed to the statement, giving a mean score of 4.07(std=0.125). Lastly, on whether there is a significant relationship between mobile money services and financial inclusion, 52% strongly agreed and 17.5% agreed to the statement. The mean score was 3.99(std=1.29) which indicated that the respondents were mostly on agreement. The overall mean was high at 4.08(std=1.25) indicating that most of the respondents were in agreement with all the statements on financial inclusion.

### 4.5 Inferential Analysis

Further the study carried out inferential statistics to examine the model as conceptualized in chapter two. Pearson correlation analysis was used to show the strength of the relationship between dependent and independent variables while regression analysis was used to confirm or reject hypothesis of this research. In addition, correlation analysis was used as a

multicollinearity test whereby if two independent variables had correlation coefficient of + or – 0.7, then multicollinearity would be a problem.

### 4.5.1 Correlation analysis

The relationship between MTN mobile money services and financial inclusion at Nkombo sector has been assessed. Statistical correlation is measured by the coefficient of correlation (r). Its numerical value ranges from +1.0 to -1.0. It gives us an indication of the strength of relationship. In general, r > 0 indicates positive correlation, r < 0 indicates negative correlation while r = 0 indicates no relationship (or that the variables are independent and not related). Here r = +1.0 describes a perfect positive correlation and r = -1.0 describes a perfect negative correlation. Closer the coefficients are to +1.0 and -1.0, greater is the strength of the relationship between the variables. As a rule of thumb, the following guidelines on strength of relationship are often useful (though many experts would somewhat disagree on the choice of boundaries). 0 to 0.25= very weak; 0.25 to 0.50=weak; 0.50 to 0.75= high; 0.75 to 1= very high. This section provides the overall findings using Pearson correlation and regression analysis to determine the impact of each of these mobile money services to financial inclusion

**Table 4.11: Correlation matrix**

| | | Financial Inclusion | Transfer Services | Mokash Services | Interoperability Services | Remittance Services |
|---|---|---|---|---|---|---|
| Financial Inclusion | Pearson Correlation | 1 | | | | |
| | Sig. (2-tailed) | | | | | |
| | N | | | | | |
| Money transfer Services | Pearson Correlation | .579** | 1 | | | |
| | Sig. (2-tailed) | .000 | | | | |
| | N | | | | | |
| Mokash Services | Pearson Correlation | .483** | .264** | 1 | | |
| | Sig. (2-tailed) | .000 | | | | |
| | N | | | | | |
| Interoperability Services | Pearson Correlation | .558** | .369** | .459** | 1 | |
| | Sig. (2-tailed) | .000 | | | | |
| | N | | | | | |
| Remittance Services | Pearson Correlation | .440** | .444** | .320** | .381** | 1 |
| | Sig. (2-tailed) | .000 | | | | |
| | N | | | | | |

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

Source: (research compilation, 2022)

As shown in Table 4.11, all the indicator variables for mobile money services: money transfer services (r=0.579, p<0.05); mokash services (r=0.483, p<0.05); interoperability services (r=0.558, p<0.05) and remittance services (r=0.440, p<0.05) were found to have a positive and significant correlation with financial inclusion since they all had (p<0.005) respectively. However, their levels of correlation were different, with money transfer services having the highest impact r=0.579 followed by interoperability services with r=0.558; then mokash services with r=0.483 and the last one was remittance at r=0.440. no multicollinearity was observed since all correlation coefficient between variables were less than + or -7.

**Table 4.12: Regression Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .724[a] | .524 | .518 | .48859 |

a. Predictors: (Constant), Remittance Services, Mokash Services, Transfer Services, Interoperability Services

Source: (research compilation, 2022)

Table 4.12 shows the summary of the regression model for the mobile money services identified in this study on financial inclusion. About these findings, the regression was fairly fit with an $R^2$=0.524, implying that mobile money services, namely mobile transfer services, mokash services, interoperability services and remittance services increases the Rwandan financial inclusion agenda by 52.4%. meaning that there was a change of 52.4% in financial inclusion as result of variations in money transfer, mokash, interoperability and remittance services. A strong positive relationship between the study variables marked by R=0.724 is shown in table 4.12 as well.

**Table 4.13: ANOVA**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 88.416 | 4 | 22.104 | 92.592 | .000[b] |
| | Residual | 80.450 | 337 | .239 | | |
| | Total | 168.866 | 341 | | | |

a. Dependent Variable: Financial Inclusion

b. Predictors: (Constant), money transfer Services, Mokash Services, Interoperability Services, Remittance Services

Source: (research compilation, 2022)

Table 4.13 provides further analysis in relation to the regression model for MTN mobile money services on financial inclusion. It shows that variations in the Rwandan financial inclusion can be explained by the model to the extent of 52.4% (88.416 out of 168.866) while other variables not captured by this model can explain the remaining 47.6% (80.450 out of 168.866) of the variations in the Rwandan financial inclusion. the regression model ($F=92.592$, $p<0.005$) was statistically significant. This means that MoMo services significantly impact the deepening of the Rwandan financial inclusion agenda, at Nkombo sector!

### 4.5.2 Hypothesis testing

**Table 4.14: Regression Coefficient Analysis**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.032 | .150 | | 6.856 | .000 |
| | Money transfer Services | .312 | .036 | .374 | 8.639 | .000 |
| | Mokash Services | .178 | .034 | .225 | 5.234 | .000 |
| | Interoperability Services | .211 | .034 | .279 | 6.208 | .000 |
| | Remittance Services | .071 | .033 | .096 | 2.177 | .030 |

a. Dependent Variable: Financial Inclusion

Source: (research compilation, 2022)

The researcher went further to conduct regression coefficients analysis to determine the relative contributing effect of each of the MoMo services on the Rwandan financial inclusion. As per the findings in Table 4.14, all the four indicator variables of MoMo services were found to be statistically significant as they all had ($p<0.05$) respectively.

$H_0$1: Money transfer service has no significant impact on deepening Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda

For money transfer services, the researcher found $(\beta = 0.374, p < 0.05)$ indicating a positive regression coefficient and since the p-value for the regression coefficient was less than 5%, it

was statistically significant. This means that the first null hypothesis was rejected at 5% significance level. It also implied that the alternative hypothesis was upheld, meaning that money transfer service has significant impact on deepening financial inclusion in Rwanda. These findings are consistent to findings from other researchers. For instance, Kendall *et al*., 2011 and Senyo *et al*., 2021 found that mobile payments are gradually replacing cash transactions. Mobile money is increasingly becoming a tool used by individuals and organizations to carry out financial operations such money transfers, bill, and school fee payments, buying phone credit and data bundles, and depositing money. found that the mobile money agents across various regions in a country provide the population with accessibility of financial services like money transfer, deposit, and bill payment services.

$H_0$2: Mokash service has no significant impact on the deepening of Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda

For mokash services the regression coefficient $(\beta = 0.225, p < 0.05)$ was positive, the p-value for regression coefficient for mokash was statistically significant since the p-value was less than 5% threshold. This means that the second null hypothesis was rejected at 5% level of significance. It also implied that the alternative hypothesis was upheld, meaning that mokash service has significant impact on deepening financial inclusion in Rwanda. This in line with Senyo *et al*. (2021) he stated that a user of mobile microloans services (Mokash) can apply for a loan using their phone, and within a short time, they will have the funds in their mobile money account, making it possible for banks to establish relationships with traditional Susu organizations which establish a credit history on which banks can make microloans available and accessible thus increasing financial inclusion.

$H_0$3: Interoperability service has no significant impact on the deepening of Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda

Similarly, for interoperability services $(\beta = 0.279, \mathrm{p} < 0.05)$ the p-value was statistically significant since the p-value was less than 5% threshold. This means that the third null hypothesis was rejected at 5% level of significance. It also implied that the alternative hypothesis was upheld, meaning that interoperability service has significant impact on deepening financial inclusion in Rwanda. Previous research also provided similar insights in their findings pointing out the significance of interoperability between mobile phones and other

banking service providers. For instance, Acquah-Sam & Bugre (2018) and by Dargahwala & Riedl (2021) showed that interoperability dramatically improves the user experience of making payments and therefore contributes to a huge increase in transactions. They found that interoperability would give mobile money service providers the opportunity to increase the volume of digital transactions, improve the sustainability of mobile money and allow clients to communicate with their banks and other financial service provides through the mobile technologies.

$H_0$4: Remittance service has no significant impact on the deepening of Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda

For remittance services ($\beta = 0.096, p < 0.05$), both showing positive and significant impact to financial inclusion as the p-value was less than 5% threshold. This means that the fourth null hypothesis was rejected at 5% level of significance. It also implied that the alternative hypothesis was upheld, meaning that remittance service has significant impact on deepening financial inclusion in Rwanda. These findings are consistence with findings from previous studies. For instance, Mustafa and Sifat (2017), Varghese, and Viswanathan (2018) Patnam, and Yao (2020) in their different research found that mobile money services have rapidly expanded across emerging and developing economies. They held that just like the way people can communicate across different geographical regions and countries, so can they transact thanks to the ability of mobile phone remittance services. They further reported that the establishment of remittance corridors for a wider population represents a huge opportunity for those abroad to remit back home via mobile phone technologies thus increasing financial inclusion.

### 4.5.3 Summary of the hypothesis testing

The summary of the results for the four hypotheses tested is provided in Table 4.15.

**Table 4.15: Summary of results for the hypotheses testing**

| Null Hypotheses | β | p-value | $R^2$ | Conclusion |
|---|---|---|---|---|
| H01: Money transfer service has no significant impact on deepening the Rwandan financial inclusion agenda at Nkombo, Rusizi, Rwanda. | .374 | 0.000 | | Rejected |
| H02: Mokash service has no significant impact on deepening the Rwandan financial inclusion agenda at Nkombo, Rusizi, Rwanda. | .225 | 0.000 | | Rejected |
| H03: Interoperability service has no significant impact on the deepening of Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda | .279 | 0.000 | 0.524 | Rejected |
| H04: Remittance service has no significant impact on the deepening of Rwanda financial inclusion agenda at Nkombo, Rusizi, Rwanda | .096 | 0.000 | | Rejected |

Source: (research compilation, 2022)

As per the findings, money transfer services have the greatest impact where one unit change of the money transfer service would cause a rise in financial inclusion by 37.4% units. On the other hand, interoperability services were second where one unit change to interoperability services would lead to an increase in financial services by 27.9%. For mokash, the contributing effect was 22.5% and for remittance services the contributing effect was 9.6%.

### 4.6 Summary of the chapter

This chapter showcased data analysis, interpretation, and discussion regarding the obtained results from the study, various statistical methods have been used, the findings are displayed in sections based on the study research questions and objectives. The analysis is offered in segments: the descriptive and inferential statistics, correlation, and regression analysis for each of the research questions.

# CHAPTER FIVE

# SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

## 5.0 Introduction

This chapter provides the summary, the conclusions and recommendations drawn from the findings in this study. It also provides the study limitations and suggestions for further research.

## 5.1 Summary of the major findings

Regarding the first study objective, which was about assessing the impact of Money transfer service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda, the findings as per table 4.6 gave an overall mean score of 3.98(std=1.3) which indicated that even though the respondents had differing opinions(heterogeneity of responses) in relation to the access and quality of money transfer services (std=1.3), yet the mean indicated that on average, the respondents were highly in agreement with the provided statements by 3.98. In addition, Table 4.11, shown that money transfer services had a ($r=0.579$, $p<0.05$) signaling a strong, positive, and significant correlation with financial inclusion. Moreover, money transfer services had a ($\beta = 0.374$) making it, the first relative contributor to financial inclusion, meaning one unit change of the money transfer service would cause a rise in financial inclusion by 37,4% units as shown from Table 4.16. Since the regression coefficient for money transfer services had a ($p<0.05$), it meant that the null hypothesis which stated that money transfer service has no significant impact on deepening Rwanda financial inclusion agenda had to be rejected thus upholding its alternative hypothesis stating that money transfer service has significant impact on deepening financial inclusion in Rwanda.

Concerning the second study objective, which was about examining the impact of mokash service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda., the findings as per table 4.7 gave an overall mean score of 3.2(std=1.19) which indicated that even though the respondents had slightly differing opinions in relation to the access and quality of mokash services (std=1.19), yet the mean indicated that the respondents were neutral with the provided statements by 3.2. In addition, Table 4.11, revealed that mokash services had a ($r=0.483$, $p<0.05$) signaling a weak but positive and significant correlation with financial inclusion.

Moreover, mokash services had a $(\beta = 0.225)$ making it, the third relative contributor to financial inclusion, meaning one unit change of the mokash service would cause a rise in financial inclusion of 22,5% units as shown from Table 4.17. Since the regression coefficient for mokash services had a ($p<0.05$), it meant that the null hypothesis which stated that mokash services has no significant impact on deepening Rwanda financial inclusion agenda, had to be rejected thus upholding its alternative hypothesis stating that mokash service has significant impact on deepening financial inclusion in Rwanda.

Vis-à-vis to the third study objective, which was about analyzing the impact of interoperability service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda., the findings as per table 4.8 gave an overall mean score of 3.56(std=1.25) which indicated that even though the respondents had differing opinions in relation to the access and quality of mokash services (std=1.25), yet the mean indicated that the respondents were highly in agreement with the provided statements by 3.56. In addition, Table 4.11, revealed that interoperability services had a ($r=0.558$, $p<0.05$) signaling a strong, positive, and significant correlation with financial inclusion. Moreover, interoperability services had a $(\beta = 0.279)$ making it, the second relative contributor to financial inclusion, meaning one unit change of the interoperability service would cause a rise in financial inclusion of 27,9% units as shown from Table 4.18. Since the regression coefficient for interoperability services had a ($p<0.05$), it meant that the null hypothesis which stated that interoperability service has no significant impact on deepening Rwanda financial inclusion agenda, had to be rejected thus upholding its alternative hypothesis stating that interoperability service has significant impact on deepening financial inclusion in Rwanda.

Lastly, the fourth study objective, which was about examining the impact of remittance service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda., the findings as per table 4.9 gave an overall mean score of 3.58(std=1.23) which indicated that even though the respondents had differing opinions in relation to the access and quality of remittance services (std=1.23), yet the mean indicated that the respondents were highly in agreement with the provided statements by 3.58. In addition, Table 4.11, revealed that interoperability services had a ($r=0.440$, $p<0.05$) signaling a weak but positive, and significant correlation with financial inclusion. Moreover, remittance services had a $(\beta = 0.096)$ making it, the least relative

contributor to financial inclusion, meaning one unit change of the interoperability service would cause a rise in financial inclusion of 9.6% units as shown from Table 4.19. Since the regression coefficient for remittance services had a ($p<0.05$), it meant that the null hypothesis which stated that remittance service has no significant impact on deepening Rwanda financial inclusion agenda, had to be rejected thus upholding its alternative hypothesis stating that remittance service has significant impact on deepening financial inclusion in Rwanda.

Concerning the impact of mobile money service towards deepening financial inclusion at Nkombo, Rusizi, Rwanda., the findings as per table 4.10, showed that a total of 75.1% of respondents were in agreement, with a high mean of 4.17 regardless of the heterogeneity of responses of about (std=1.22), also respondent's views on whether mobile money services have impact on the desired/increased quality of financial services offered at Nkombo, a total of 71.7% agreed to the statement, giving a high mean score of 4.07(std=0.125). In addition, when respondents were asked on whether there is a significant relationship between mobile money services and financial inclusion, 69.5% agreed to the statement with a high mean score of 3.99 (std=1.29). overall, a high mean score of 4.08 resulted from respondent's views on financial inclusion statements, with a (std=1.25)



**5.2 Conclusion**

First of all, the researcher noticed an important factor whereby transaction fees were indicated as the greatest hindrances to accessing financial services at Nkombo, because looking at all the strongly disagree scores in all the mobile money predictor variables, transaction fees frustrated the people the highest! Meaning that mobile money providers should reduce the cost of usage of their services to facilitate access to financial services at least to vulnerable group of the society like poor people who might be deficient in terms of financial capacity! This transaction fees issue was closely followed, by the eminent lack of awareness for mobile money products and services which reveals that there is a huge untapped potential to financial inclusion if product awareness was taken into account! As a matter of fact, Remittance services was found to be the lowest relative contributor to financial inclusion ($\beta = 0.096$), followed by mokash services ($\beta = 0.225$) this calls for further research on whether these two financial services are not relevant to the Nkombo population needs so that mobile money team would update them accordingly!

Secondly, the regression model for mobile money services showed that the regression was fairly fit with an $R^2$=0.524, meaning that there was a change of 52.4% in Nkombo sector financial inclusion as result of variations in money transfer, mokash, interoperability and remittance services, this also means that the remaining 47.6% variation in financial inclusion at Nkombo sector, would be explained by other variables not captured in this research such as financial literacy, products awareness, trust in financial services providers or financial capacity! A strong positive relationship between the study variables marked by R=0.724 was also shown by the same regression model, the regression model (F=92.592, $p<0.05$) revealed that the model was statistically significant to explain the deepening of financial inclusion which also means that MoMo services significantly impacted the deepening of the Rwandan financial inclusion agenda, at Nkombo sector!

Lastly, based on the result of this research, we therefore conclude that mobile money services do have an impact on deepening the Rwandan financial inclusion agenda at Nkombo sector which was supported by the rejection of all null hypothesis of the research as their p value were less than 0.05 ($p<0.05$) respectively.

**5.3 Recommendations**

Based on the findings of this research, The researcher recommends that financial literacy should be emphasized upon because though financial products might be available, if the users are not aware of the opportunities of MoMo and are not equipped with the skills to use mobile money services, it will hinder the deepening of financial inclusion. Also, Financial service providers would segment their customer base, so that they may conduct tailored promotions, give discounts, targeting the vulnerable group of the society like poor people, remote and secluded people as of Nkombo in order facilitate access to financial services.

On the other hand, the researcher recommends that mobile money services providers should improve its application security. Many people are afraid to link their banks with their phone due to the prevalent fear of fraudulent activities and the risks that mobile banking has been associated with. Therefore, in line with the government's agenda to deepening financial inclusion, MTN should increase end to end encryptions to safeguard their clients' money which in turn would increase user's trust resulting in a qualitative financial inclusion. Lastly, increased system Interoperability would give mobile money users the freedom to link their

MoMo account with any bank of their choice or be able to freely transact worldwide.

### 5.4 Study Limitations

According to Connelly, L. M. (2013) limitations frequently center on the study's internal and external validity. While external validity focuses on the application of the findings to larger groups, internal validity addresses the rigorous design of the study (generalization). This makes the study a serious scientific examination. First, the researcher was limited by budget constraints in terms of transport as the island is very remote and accessing it requires to go by bus and boat. Second limitation was inconsistency with the way financial inclusion is measured as it seems that there's no agreed upon indicators of financial inclusion some use access, usage, and quality; others suggest access, usage, barriers, and welfare. Thirdly, lack of detailed data, as the FinScope 2020 reports nationwide data but doesn't provide district level data. Lastly, they are illiterate people, answering questionnaire was a bit tricky for them, it was necessary to find personnel to help them in responding to the questions.

### 5.5 Suggestions for Further Studies

The study makes the following suggestions for further studies:

i). The effect of financial literacy on improving the financial inclusion in Rwanda.
ii). The impact of agency banking on the financial inclusion of the rural areas in Rwanda.
iii). The effect of financial deepening on the inclusivity in the formal financial sector in Rwanda.

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# APPENDICES

## QUESTIONNAIRE

Dear respondent, my name is Mutabazi jean pierre, a university of Kigali master's students, I am researching on the impact of mobile money on deepening the Rwandan financial inclusion plan in your area (Nkombo sector/Rusizi district) as a partial fulfillment of the requirement for the award of a master's degree in accounting and finance at University of Kigali. The questionnaire items are about the undergoing study, and I kindly request your participation in responding to the questions provided below. The study's findings will only be utilized for academic purposes, and the information provided is treated as confidential.

Section A: Demographics.

Please tick before the right answer.

| Profession | | Education | | Marital status | | Gender | |
|---|---|---|---|---|---|---|---|
| Fishing | | No education | | Single | | male | |
| Government worker | | Primary school | | Married | | Female | |
| Teacher | | Secondary school | | Divorced | | | |
| Farmer | | Bachelor's degree | | | | | |
| Jobless | | Master's degree | | | | | |

SECTION B: The assessment of the mobile money services at Nkombo island.

What is your level of agreement with the following statements relating to above topic?

(1-strongly disagree, 2-disagree, 3-neutral, 4- agree, 5-strongly agree,)

| **Money transfer services** | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| I can receive any amount of money, anytime and anywhere | | | | | |
| I can easily deposit or withdraw money due to being at close proximity with MoMo agents | | | | | |
| The transfer and withdraw fees are fair and affordable to me | | | | | |
| Money transfer menu is understandable due to being displayed in my local language | | | | | |
| In case i make any wrong money transfer i get quick support | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| There's no daily limit to the amount of money i am allowed transfer | | | | | |
| Money transfer services remains operational 24/7 | | | | | |
| The cost to open a money transfer account is fair and affordable to me | | | | | |
| I am well aware of the rules and regulations that governs money transfer services | | | | | |
| In case of any money transfer related issue, I know how, where and to whom I would address it | | | | | |
| **Mokash services** | **1** | **2** | **3** | **4** | **5** |
| Mokash services gives me access to save funds and withdraw them | | | | | |
| I am allowed to access Mokash loans as a MoMo user | | | | | |
| The interest rate to mokash loans is fair to me | | | | | |
| Opening and using mokash services is easy and understandable to me | | | | | |
| Mokash services remains operational 24/7 | | | | | |
| No collateral is required to get a mokash loan | | | | | |
| The process to get a mokash loan is easy | | | | | |
| due to mokash i no longer save under the mattress | | | | | |
| I am well aware of the rules and regulations that governs mokash services | | | | | |
| In case of any mokash related issue, I know how, where and to whom I would address it | | | | | |
| **Interoperability services** | **1** | **2** | **3** | **4** | **5** |
| MoMo and AIRTEL interoperate thus i can send money to airtel | | | | | |
| MoMo and AIRTEL interoperate thus i can receive money from airtel | | | | | |
| MoMo and banks interoperate thus i can push money to my bank account | | | | | |
| MoMo and banks interoperate thus i can pull money from my bank account | | | | | |
| Mobile money is interoperable with banks and other financial services. | | | | | |
| the transaction fees for interoperability operations are fair and affordable to me | | | | | |
| Interoperability services remains operational 24/7 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| I no longer queue on the bank due to Interoperability services | | | | | |
| Due to interoperability services, I am enabled to make payments on several platforms using my MoMo | | | | | |
| I am well aware of the rules and regulations that governs interoperability services | | | | | |
| In case of any interoperability issue, I know how, where and to whom I would address it | | | | | |
| **Remittance services** | **1** | **2** | **3** | **4** | **5** |
| I am able to remit money abroad using MoMo | | | | | |
| I am able to receive money from abroad on my MoMo wallet | | | | | |
| The remittance services menu is understandable and easy to use | | | | | |
| Remittance services remains operational 24/7 | | | | | |
| Remittance fees are fair and affordable to me | | | | | |
| there is no capping on the amount i can remit using MoMo | | | | | |
| Remittance menu includes all the countries I would wish to send money to | | | | | |
| I am well aware of the rules and regulation of MoMo Remittance | | | | | |
| In case of any remittance issue, I know how, where and to whom I would address it | | | | | |



**Section C:** The Assessment of Financial Inclusion in Nkombo Island.

What is your level of agreement with the following statements related to financial inclusion at Nkombo/Rusizi? (1-strongly disagree, 2- disagree, 3-neutral, 4-agree, 5-strongly disagree)

| **Financial inclusion (Questions relating to access and quality)** | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Mobile money services have impact on the increased access of financial service at Nkombo | | | | | |
| Mobile money services have impact on the desired/increased quality of financial services offered at Nkombo | | | | | |
| There is a significant relationship between mobile money services and financial inclusion | | | | | |

Thanks for your cooperation.

## Appendix I: Proposed Budget for The Study

The research Budget is the total expenses in terms of money that the research is expected to spend during the research

| Particulars | Quantity | Amount (RWF) |
|---|---|---|
| Stationary | Paper 5 Reams | 20,000 |
| | Ink 1 Cartridge | 10,000 |
| | Binding materials 1 | 10,000 |
| Transport & consultancy cost | | 300,000 |
| Data analysis | | 50,000 |
| Project report | | 150,000 |
| Miscellaneous | | 200,000 |
| Last Semester fees | | 175,000 |
| **Total** | | **915,000** |



## Appendix ii: Schedule of Activities /Timeline

The research schedule is expected to conduct the research activities and the timeline in the way stated in the table below

| MONTHS | April-May 31st | | | | June 30th | | | | JULY-AUGUST 31st | | | | September | | | | October | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tasks/Weeks** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | **2** | **3** | **4** | **1** | | | |
| Proposal writing | | | | | | | | | | | | | | | | | | | | |
| Proposal Defense | | | | | | | | | | | | | | | | | | | | |
| Data collection | | | | | | | | | | | | | | | | | | | | |
| Data entry and coding | | | | | | | | | | | | | | | | | | | | |
| Data Analysis | | | | | | | | | | | | | | | | | | | | |