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Does the development of mobile financial services have an impact on financial inclusion in Lesotho?: the case of M-Pesa and eco-cash

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Does the development of mobile financial services have an impact on financial inclusion in Lesotho? The case of M-Pesa and Eco-cash

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A research study submitted

to the faculty of Commerce, Law and Management

at Wits Business School

for the degree of

Master of Management in Finance and Investment

at the University of the Witwatersrand

Supervisor: Prof. Odongo Kodongo

DECLARATION

I, at this moment, affirm that the research project entitled ***"Does the development of Mobile financial services have an impact on Financial Inclusion in Lesotho? The case of M-Pesa and Eco-cash"*** submitted for the degree of Master of Management in Finance and Investment at the Wits Business School, is a record of original independent work done by me under the guidance and supervision of Prof. Odongo Kodongo. I furthermore declare that this thesis has not been submitted to another university or a different faculty at Wits University, either partly or in full.

M.F. Jonathan _____

Signature

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First of all, I would like to give glory to God for giving me strength and wisdom throughout my research work and for His unconditional love and guidance.

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ABSTRACT

The purpose of this study is to assess the effect that the growth of mobile financial services has had on financial inclusion in Lesotho. The research focused on the two leading mobile network operators (MNOs), Econet Lesotho and Vodacom Lesotho, who launched the country's two Mobile Money services. Over the years, Mobile Money services have increased rapidly, largely replacing the traditional way of banking in the everyday lives of Basotho people. The study aimed at examining the reasons for this transition and how this new development has affected Lesotho in general.

The report contains arguments that Mobile Money was indeed an invention that most people welcomed. The study found that most individuals prefer the use of mobile financial services to that of banks for various reasons: some indicated that bank charges are too costly for them; many who reside in rural areas do not have access to bank branches as they are usually located in the city; many also complained about the extensive documentation required to open a bank account. Although the government of Lesotho has implemented various means and strategies in the past in an attempt to increase financial inclusion in Lesotho, this has not been successful.

The study used quantitative methods to examine the effect of mobile financial services on financial inclusion. Primary data was collected through the distribution of self-administered structured questionnaires on a sampled population of 114 individuals. For rigorous empirical testing of the data, secondary data was used to unravel the extent of the impact of mobile financial services on financial inclusion. However, both primary and secondary data were essential for reaching the final conclusions and findings of the study. Therefore, after all the analyses and evaluations, it was concluded that, despite its challenges, Mobile Money has improved the financial inclusivity of the many unbanked residents of Lesotho.

Key words: Financial Inclusion, Mobile Money, Financial Services, M-Pesa, Eco-Cash, Unbanked, MNOs, Traditional banking

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CHAPTER 1:
INTRODUCTION TO THE STUDY

1.1 INTRODUCTION

The degree of financial inclusion varies from country to country based on their processes of economic and commercial growth. Industrial countries, such as the United States of America (US) and the United Kingdom (UK), have found methods of offering financial services to the vast bulk of their populace. However, in emerging African countries, financial inclusion continues to be a significant challenge. The majority of these countries face obstacles caused by inadequate infrastructure, and a considerable section of the population living in rural territories are unable to access financial services. These individuals are either totally barred from banking or have minimal access to realistic financial services (Kempson, 2006; Oji, 2015).

Lesotho is a closed-in kingdom entirely surrounded by the Republic of South Africa, with approximately 2.2 million citizens (IMF, 2013). There are four authorised banks in Lesotho that form the centre of the financial system; these banks are: Standard Lesotho Bank, the largest by its assets, First National Bank of Lesotho, Nedbank Lesotho, as well as Lesotho Post Bank. There are also a range of credit-only Microfinance Institutions (MFIs) in Lesotho: Letshego Financial Services (the largest), the Alibaba Financial Services, Lesana Lesotho Limited, Net Credit Loans, Edu Credit Loans, Blessing Financial Services, and many others. In addition, there are 70 cash loan specialists, over 240 savings and credit cooperatives, and a noteworthy financial union called Boliba Savings and Credit Cooperative (Central Bank of Lesotho, 2016).

In addition, Lesotho has around 30 authorised insurance brokers and about ten approved insurance agencies that specialise in both general and life insurance. Despite all these financial institutions, banks have historically been the focus as they constitute a significant part of the

financial sector and are the country's largest distributors of commercial services. The table below illustrates the size and structure of the financial system in Lesotho in Millions of Maloti.

Table 1.1: Size and structure of the financial system in Lesotho

	December 2010				December 2016			
	Number of Firms	Assets	Assets as % of Total	Assets as % of GDP	Number of Firms	Assets	Assets as % of Total	Assets as % of GDP
Banks	**4**	**8,010**	**56.7**	**45.9**	**4**	**13,725**	**48.8**	**40.7**
Foreign Private	3	7,745	54.8	23.0	3	12,472	44.4	37.0
Domestic Public	1	265	1.9	0.8	1	1,253	4.5	3.7
Nonbanks	**439**	**6,121**	**43.3**	**35.0**	**508**	**14,373**	**51.2**	**42.6**
Insurance 1/	8	2,408	17.0	13.8	11	5,322	18.9	15.8
Public Pension Fund	1	2,377	16.8	13.6	1	4,700	16.7	13.9
Collective Investment Schemes 2/	8	1,198	8.5	6.9	7	3,035	10.8	9.0
Microfinance Institutions 3/	n.a.	n.a.	n.a.	n.a.	7	722	2.6	2.1
Other 4/	422	138	1.0	0.8	482	594	2.1	1.8
Total Financial System	**443**	**14,131**	**100.0**	**80.9**	**512**	**28,098**	**100**	**83.4**

1/ Includes private pension products.
2/ Includes asset management companies.
3/ Data not available for 2010.
4/ Money lenders, credit only institutions, exchange bureaus, money transfer companies, and insurance brokers. Includes financial cooperatives, for which data are not available for 2016.

Source: CBL and IMF Staff estimates, 2017

Banking service accessibility is, however, particularly low in Lesotho because of a limited number of bank branches and ATMs in most parts of the country. Access to banking services is unquestionably difficult for the rural population, given that the focus of formal banks is mostly on urban areas.

It was, therefore, essential to find a more modern financial approach for integrating the country's rural and low-income population into the formal financial system. As a result of the growing implementation of Mobile Money in Kenya, various other developing countries, including Lesotho, sped up their efforts to implement Mobile Money services in efforts to expand the accessibility of financial services to a greater part of the population (Central Bank of Lesotho, 2016).

Mobile Money platforms originally entered the Lesotho financial sector in 2012, when Econet Telecom Lesotho (ETL) presented Eco-cash, and subsequently, Vodacom Lesotho (VCL) launched M-Pesa the following year. Mobile Money is utilised as a channel offering creative and negligible cost credit, reserve funds, and insurance products. It also substantially decreases the expenses of exchanging and receiving money, as well as making required payments, as compared to the formal means of money transfer.

1.2 BACKGROUND TO THE STUDY

This section presents a discussion of the concept of Mobile Money, and then introduces Eco-cash and M-Pesa as the Mobile Money platforms that are the focus of the research study.

1.2.1 Mobile Money

Mobile Money is a financial transaction service where money is transferred electronically using a cell phone without the need for a bank account. Initially, the concept of Mobile Money was made famous in 2007 by M-Pesa's Safaricom and Vodafone in Kenya, where ''M'' stands for mobile and "Pesa" for money in Swahili (ACP Observatory on Migration, 2014). The M-Pesa application is installed on a subscriber's SIM card and functions on any mobile phone. Clients register at no cost, and a bank account is not a prerequisite. The mobile money transfer service was instantly preferred for use as a simple bank account framework and an electronic system for paying accounts and merchandise, as well as other administrative tasks (ACP Observatory on Migration, 2014).

The utilisation of Mobile Money involves balance checking, funds transfer, depositing and withdrawing of cash, buying airtime, savings, account settlements, and the long-distance transfer of funds (Central Bank of Lesotho, 2016). The primary goal of the use of Mobile Money is to provide financial services to people who need it the most, namely, the unbanked, the rural population, and the low-income earners.

The service additionally aims to diminish the lengthy time individuals spend in long queues and the extended travels they have to endure to pay their accounts with cash. Many countries around the world have recognised the value of Mobile Money services, notably M-Pesa in Kenya, and they have embraced the initiative to implement similar and related services in their territories. M-Pesa has made financial transactions cost-effective, safe and convenient for a large number of citizens who are not included in the banking system. Econet Lesotho (ETL) and Vodacom Lesotho (VCL) initiated Mobile Money services to minimise financial exclusion, as well as to boost economic development in Lesotho (Central Bank of Lesotho, 2016).

In 2012 ETL initiated its Mobile Money service called Eco-cash, and VCL launched M-Pesa in 2013. M-Pesa signed up as many as 745 242 subscribers and over 1 990 agents since its launch in 2015. During the same time, Eco-cash signed up 318 786 subscribers and over 1 470 agents throughout the country. The number of Mobile Money customers registered in the country has since then continued to expand remarkably (Central Bank of Lesotho, 2016).

In an incredibly short time, cells phones and the internet have become an indispensable part of life for most people in developing countries. Cell phones specifically, are readily available in most countries. Individuals worldwide use their cell phones for several reasons, particularly for calls, messaging and photography. To a lesser extent, mobile phones are also used to obtain customer, political, health and economic reports (Pew Research Center, 2013).

1.2.2 Eco-cash (Econet Lesotho)

Eco-cash, which is a Mobile Money service provider for Econet Telecom Lesotho, enables customers to access their funds by using cell phones to send and receive money, pay for goods and services, and withdraw cash at Eco-cash registered agents countrywide (ITU Regional Standardization Forum, 2018).

To execute transactions, clients must have money in their mobile accounts, while the agents require an e-wallet float to service customer withdrawals; this is a liquidity requirement. The Eco-cash service, unlike M-Pesa, enables registered customers with bank accounts to transfer money from their bank account to their mobile wallet. Subscribers and Eco-cash agents can swipe their bank cards to get virtual money in their portfolios; it also enables clients to receive cash value from international service providers on their mobile phones (ITU, 2018). Every loti (Lesotho currency) deposited by customers and agents on their mobile phones is in line with real cash in a bank (trust account).

1.2.3 M-Pesa (Vodacom Lesotho)

Concerning M-Pesa, Kenya seems to be at the forefront of Mobile Money service developments, and in 2013 the number of agents across the country rose by 40%. Estimates show that approximately 24.8 million subscribers, both banked and unbanked, use Mobile Money services (Communication Commission of Kenya, 2013). People who live in Kenya use mobile financial services to send or receive funds more frequently than those living in 24 other African countries reviewed: More than half of the adult population in Kenya uses Mobile Money services (Pew Research Centre, 2013).

It's become apparent that Mobile Money has expanded rapidly in many emerging countries, including Lesotho. Vodacom Lesotho is an auxiliary of the South African-based Vodacom, and it became operational in Lesotho in 1996.

1.2.4 Competition in the sector

There has always been competition in the mobile sector between these two leading providers of Mobile Money in Lesotho.(Central Bank of Lesotho, 2016). M-Pesa and Eco-cash provide mobile payments and free cash transfers to the unbanked population. The service is achieved through an online account called a mobile wallet that is attached to a cellular phone SIM card

(ACP Migration Observatory, 2014). The electronic account is kept secure by a personal identification number (PIN) only known to the user. As soon as a transaction goes through, accounts are debited or credited.

1.3 CONTEXT OF THE STUDY

The intricacies involved in improving the rural population's access to banking services has created an opportunity for mobile financial services to offer strategic solutions, as it considers the financial knowledge, and ease of accessibility to financial services for low-income earners. The number of mobile users who have not yet registered for mobile financial services is likely to increase as technology progresses. Mobile Money services are usually provided by a consortium of mobile network providers, agents, banks and network managers. Any distinctive relationship difficulty amongst these parties within the organisation could not only cause inconvenience to the customer (Lake, 2013), but could also lead to failure in successfully executing transactions. Also, the lack of transparency concerning who actually holds the client's cash makes it difficult for the client to enforce his rights whenever a dispute may arise.

When Mobile Money was initially introduced to individuals, its primary services were to send or receive allowances, which allowed the unbanked community to offer financial assistance to family members in remote areas of the country. As of late, Mobile Money has made the materialisation of a range of innovative services possible, including paying school fees, settling utility accounts, purchasing or selling merchandise, cab/taxi fares, as well as processing easy loan repayments (Omwansa, 2009). Another creative addition to Mobile Money services is prepaid airtime. Several companies have also implemented this service to pay salaries to their unbanked employees via their mobile phones, as opposed to paying cash.

Mobile Money services can be likened to having a bank in your pocket; it is just a click away and brings financial services to both the rural and the unbanked population. Mobile technology

is rapidly shifting economic life in developing countries since numerous individuals with no access to banking services can use cell phones for financial transactions. Recently, banks and mobile operators also use Mobile Money to give millions of unbanked customers a different approach to saving and accessing money electronically.

Mobile Money is changing lives by providing access to resources such as electronic means of payment and receiving of funds. It provides the unbanked and the rural community with the option of using their mobile phones as bank accounts for deposits, withdrawals and transferring money. Individuals can also use cellular phones to make payments and buy electricity.

Cell phones have an incredible potential for conveying mobile financial services to a progressively broader customer base because of their massive take-up by the unbanked and low-income earners in emerging countries. Also, cellular telephones are used wherever there is a cell phone connection, and this overcomes the problem of distance and scarcity of branches of banks in remote areas. In this respect, it improves the likelihood of all-encompassing access to financial services (Central Bank of Lesotho, 2016).

The fact that Mobile Money makes use of the readily available mobile infrastructure to deliver all services online, enables depositing and withdrawing to be cost-effective for the underprivileged (Flores-Roux & Mariscal, 2010). It is also considered the most secure, accessible, efficient and user-friendly system for providing financial services to the disadvantaged public.

In Lesotho, a vast number of people living in rural areas currently own mobile phones, which are used to transfer and receive cash through M-Pesa or Eco-cash agents. In 2016, roughly 99.7% of the country's total population started using mobile telephony networks, and only 13.7% of the overall population still made use of the fixed-line telephones (LCA, 2017). Conveniently for everyone, this usage of mobile phones and the relocation of innovations from

fixed to portable devices did not only take place in developed countries, but it likewise stood out as news-worthy in developing countries.

The invention of Mobile Money has certainly offered a glimpse of hope in developing countries like Lesotho for those previously financially excluded. Mobile Money is an alternative that can help to escape the inadequate financial system in many developing countries through the provision of low-cost financial services using mobile phone networks. It is the simple, fast, accessible "bank in your pocket" mobile phone usage and network agents throughout the country that could make access to financial services cost-effective (Ketly & Kasi, 2015).

1.3.1 Financial inclusion in Lesotho

Between 2013 and 2016, the banking infrastructure extended by just two branches, 39 ATMs, and 365 points of sale (Central Bank of Lesotho, 2016). It was distinctly evident that there wasn’t much change in Lesotho as far as financial inclusion was concerned. The situation is exacerbated because a large group of banking services are in urban areas, while two-thirds of the country's population resides in rural areas. The assumption here is that approximately 60% of the country must travel for at least one hour to access a branch of a bank, whereas 24% of the population lives within 20 minutes from a bank; this makes it difficult to even seek to establish a bank account for the rural community. Only 29.5% of Lesotho's rural population has a bank account, compared to 57.9% in urban areas (Jefferis & Manje, 2014).

Fin Scope estimates (Finmark Trust, 2017) show that financial inclusion stands at 80.9% of the Lesotho adult population Just 45.8% of adults, however, use formal banking and non-bank services; 38% of which hold a bank account. Casual service utilisation is moderately elevated, with 62.4% of the adult population making use of such services, in particular, funeral insurance, which is a limited commodity in contrast with the broad spectrum of economic needs for financial assistance (Lesotho Fin Scope, 2011; Jefferis & Manje, 2014).

Nonetheless, within the South African Customs Union (SACU) and the Southern African Development Community (SADC) countries, Lesotho is regarded as having a high degree of financial inclusion; South Africa and Namibia alone have outgrown it (Ketly & Kasi, 2015). Therefore, it is accurate to say that Mobile Money has further increased the level of financial inclusion in the country by giving the unbanked and rural population access to mobile financial services.

1.3.2 Access and ownership of cell phones

According to the Boston Consulting Group (2011, pp. 1-16), "the traditional banking system has failed to supply financial services to a substantial number of low-income individuals, in particular those in rural areas, owing to high infrastructure costs, operating costs and low productivity associated with low-income customers". In contrast, the transmission of Information and Communication Technologies (ICTs) and mobile telephony have had a substantial effect in reducing financial inclusion limitations. In this way, "ICT has enabled a large number of people otherwise excluded from the formal financial system to conduct relatively cheap, safe and reliable financial transactions through their mobile phones" (Dube, Chummun, & Chtakunye, 2014, pp. 216-224).

In Lesotho, as of 2015, the mobile subscription rate stood at 78.65%, while the fixed-line subscriptions were at 1.09% (LCA, 2017). The report demonstrates that about 69% of mobile users in Lesotho own one SIM card, which implies their registration to a single network. Results additionally show that 30% of mobile phone owners who are younger than 45 years have more than one SIM card; this is to enable users to enjoy benefits from both networks.

Owning a mobile phone plays a vital role in becoming a member of the Mobile Money programme. Fortunately, a vast population of unbanked and rural residents now own a mobile phone and are acquainted with the essential things they need to know in order to connect to

different locations with either of the network providers to receive money or transfer money to different individuals. The use of one's phone for Mobile Money services is also free of interest and transaction fees.

Figure 1.1 illustrates the patterns in mobile sector teledensity over the ten years from 2004 to 2014. The total number of mobile subscribers in 2014 was 1 753 323 from the 1 580 713 registered in the previous year (LCA Annual Report, 2013/2014).

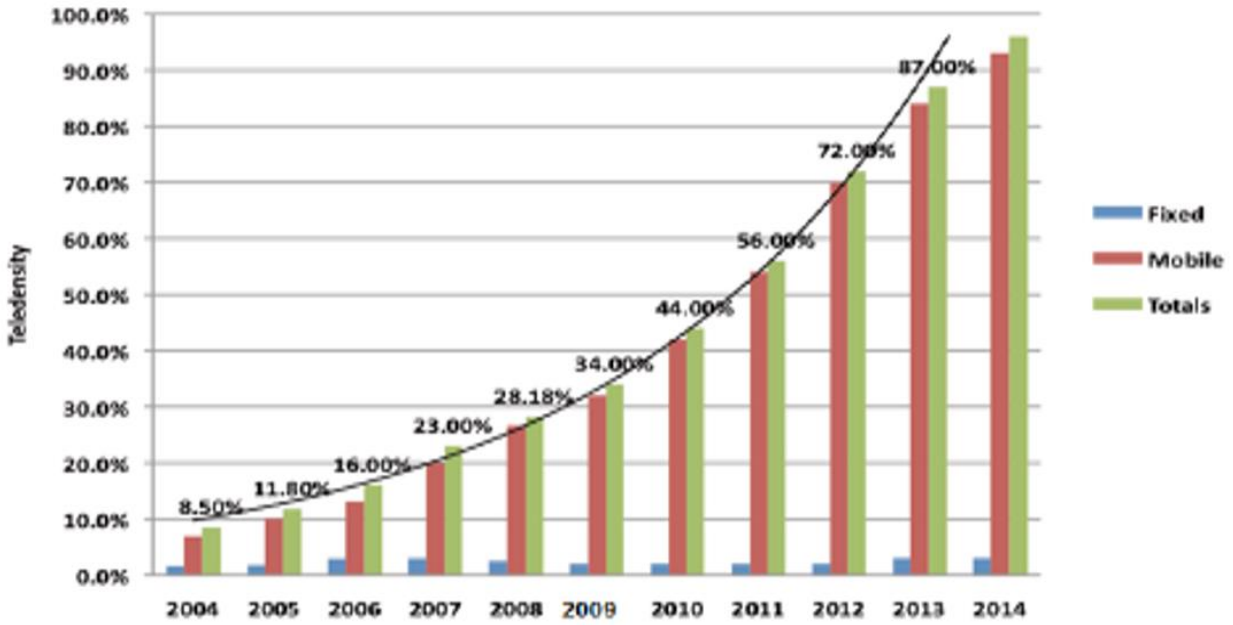


Figure 1.1: Mobile sector teledensity trends

Source: LCA, 2014

1.3.3 Mobile Money Challenges

Challenges faced by Mobile Money services include low levels of financial literacy, which hampers their economic penetration into rural areas, and weak liquidity management by most Mobile Money agents, suggesting that some are at times short of cash for withdrawals. This is a source of frustration and irritation for customers. Mobile Money agents also enjoy serving urban areas where everything is easily accessible. Mobile Money agents are highly concentrated in the cities, but scarce in remote communities. A further problem is the limited

use of Mobile Money for salary payments of low-income earners, and the lack of full interoperability between Mobile Money operators and banks (Lake, 2013).

“Like any local payment system, Mobile Money also poses inherent risks such as money laundering, privacy and security, consumer protection, extortion, fraud and liquidity risk” (Lake, 2013, p.3). Risk-adjusted measures to counter money-laundering (Anti-Money Laundering (AML) Policies) were implemented in multiple Mobile Money applications to expand services to the financially excluded population.

Despite this, “fraudulent individuals circumvent these controls by isolating large sums of funds into small ones that fit within the limits of the restriction associated with multiple accounts and mobile phones and then transfer the funds” (Lake, 2013, p.13).

Mobile Money can also compromise confidential components of client information and privacy. It may not only enable someone else to recreate the customer's identity in the system and use it to perform transactions illegally, but may also pose various other risks to the consumer, such as loss of payment due to faulty transmissions or illegal activity involving a telephone operator, agent or other provider of payment services (Lake, 2013). In this respect, the ongoing proliferation of Smartphone apps may create vulnerabilities to malware attacks, which can increase the risk of payments as fraudsters may access personal information stored on the mobile phone or obtained via a phone application (Lake, 2013).

However, lack of cash or electronic buoy at the agent's office can interfere temporarily or indefinitely with a customer attempting to deposit or withdraw money into or out of the network. Furthermore, insufficient network coverage and poor access to pay points make it difficult for consumers to carry out transactions, interrupting the service or cancelling the transaction, thereby affecting the agents' revenue generation. In addition, the technical flaws and transaction delays in the network generally leave consumers and agents in the awkward

position of uncertainty as to whether or not the transaction was completed, and therefore unsure as to whether it should be re-submitted.

1.4 PROBLEM STATEMENT

Lesotho is one of the African countries where a significant proportion (27%) of the population do not own bank accounts or do not have access to banking services, especially in rural areas (Finmark Trust, 2017). A Fin scope article (Finmark Trust, (2017) showing the level of financial services in SACU member states, shows that the banking industry services 28% of the population in Lesotho; Non-bank services are maintained at 23%, private services at 20%, while 19% are not serviced at all. The banking industry, however, is mostly concentrated in urban areas, and this excludes the large rural population, which makes up around 65% of the people in the country. Figure 1.2 shows the percentage of financial services provided in SACU member states.

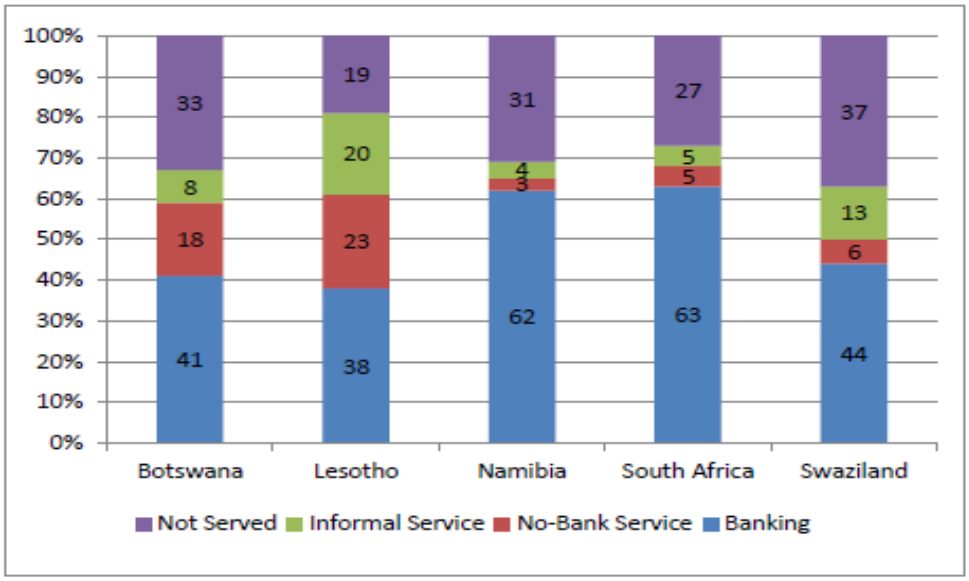


Figure 1.2: SACU member states' financial services

Source: Finmark Trust (2017)

Nevertheless, it is noteworthy that the vast majority of the Basotho population own a mobile phone that not only assists with communication, but also helps the unbanked population to make money transactions via the two Mobile Money systems (M-Pesa and Eco-cash) operated

by the two network services primarily used in Lesotho (VCL and Econet). Approximately 69% of rural people currently rely on Mobile Money for financial services, because it is easily accessible and affordable (Central Bank of Lesotho, 2016).

Mobile Money providers also have operating challenges. For example, operators face stringent regulations which vary across countries. They need to ensure their own safety, while keeping the transaction simple, and at the same time, educating customers on the use of the service, since the majority were only schooled up to primary level. There is also a need for more sales outlets around the ten districts of Lesotho (both rural and urban) to attract more consumers, as well as to improve the services on offer, such as facilitating more substantial transactions. The issue of financial inclusiveness in many African countries, including Lesotho, has become a political priority.

In recent years, there have been a few studies in Lesotho aimed at linking Mobile Money with financial inclusion. This was, however, before the country discovered the full value of Mobile Money in greater depth. Accordingly, the assumption is that findings from the past could vary from what studies could now uncover. This study focuses on the two Mobile Money services found in Lesotho and aims to see if there is any connection between the extensively expanding Mobile Money financial system and the rise in financial inclusion seen in recent years.

The high level of financial inclusion in Lesotho is not entirely due to traditional banking practices. The use of Mobile Money and private services in Lesotho has become relatively high; around 62.4% of the population depends on these services (Jefferis & Manje, 2014). Consequently, this study aims to authenticate any long-term or short-term relationship between the two Mobile Money operations and financial inclusion in Lesotho.

1.5 RESEARCH QUESTIONS

The research seeks to address the following research questions:

- To what extent has the use of Mobile Money helped to promote financial inclusion for unbanked populations in Lesotho?
- What are the advantages and drawbacks of using Mobile Money as the only way for rural and low-income households to achieve financial inclusion in Lesotho?

1.6 RESEARCH OBJECTIVES

The following primary and secondary objectives have been formulated for the present study.

1.6.1 Primary objectives

The key (broad) objective of the research is to evaluate the effectiveness of mobile financial services in promoting financial inclusion by targeting unbanked communities in Lesotho.

1.6.2 Secondary objectives

The secondary objectives of the study are as follows:

- To determine the extent to which Mobile Money services helped to foster financial inclusion in Lesotho.
- To assess the advantages and challenges faced by consumers and operators of Mobile Money services.

1.7 SIGNIFICANCE OF THE STUDY

The underlying principle behind this research is to consider the impact Mobile Money has had on financial inclusion in Lesotho. The research investigated the difficulties and advantages associated with using mobile financial services as an alternative banking system. The growth of Mobile Money services in the daily lives of Lesotho residents influenced the study. Account

payments, airtime transactions, money transfers and other facilities that are only accessible via formal banking, and that are mostly inaccessible to rural and low-income people, are accessible through the use of Mobile Money. Figure 1.3 shows the use of Mobile Money in Lesotho with the value expressed in millions of Maloti.

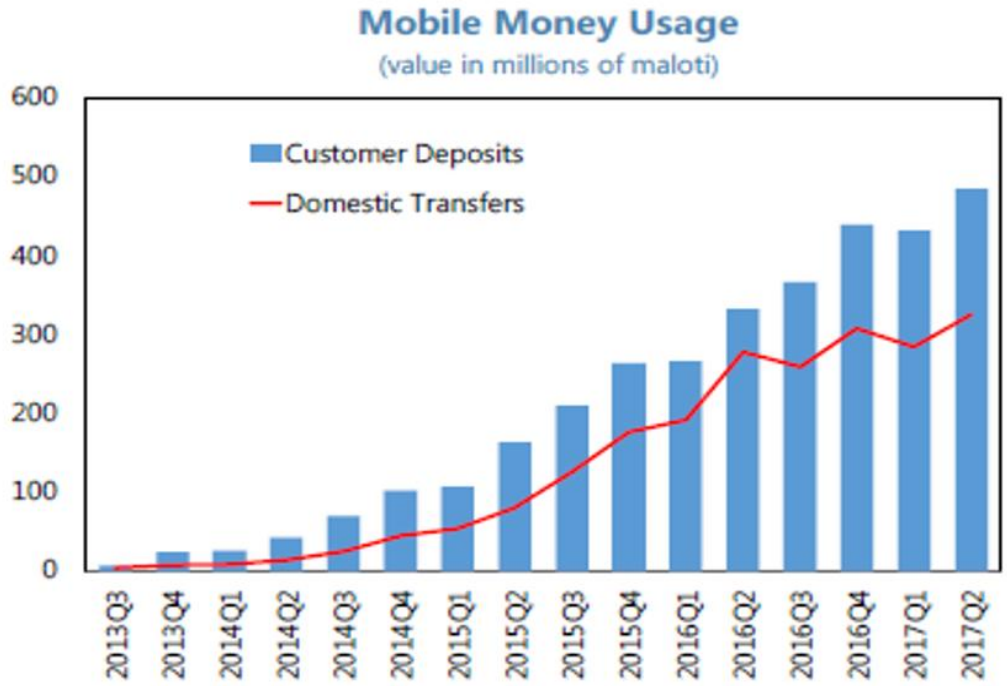


Figure 1.3: Mobile Money usage

Source: IMF, 2018

A large proportion of Lesotho's population is also excluded from the formal financial economy because of the high prices of traditional banking. The government and other national organisations have sought to improve the level of financial inclusion in Lesotho, but have failed to achieve this satisfactorily. The introduction of Mobile Money is considered to be the ideal solution for this mountainous country, with to its low level of economic progress.

The research aims at finding evidence to validate the hypothesis, and thus help to discover other approaches that may improve the use of Mobile Money services. The study also aims to identify obstacles that the community may face when using these services as their alternative financial system, and then to find ways to correct or mitigate these obstacles.

In addition, this study aims to assist all those with little or no awareness of how mobile financial services operate to gain an understanding of how the use of Mobile Money can benefit them, as well as highlighting the challenges they may face. It aims to encourage the unbanked and rural community who are not already using these programmes, to familiarise themselves with the fact that there are alternative ways of being financially included. Also, it aims to support those who already use the services in making better use of them in a way that can benefit them as individuals.

1.8 ORGANISATION OF THE THESIS

The following is an overview of the chapter structure in the study:

Chapter 1: This chapter presented the introduction to the study. It discussed the background to Mobile Money services in Lesotho, in particular Econet Lesotho's Eco-cash and Vodacom Lesotho's M-Pesa. The chapter discussed the context of the study, which focuses primarily on financial inclusion in Lesotho, ownership of cell phones and Mobile Money challenges. Finally, the chapter presented the problem statement of the study, research questions, research objectives, as well as the study's significance.

Chapter 2: The emphasis of this chapter is on the theoretical literature related to the critical concepts, namely, Mobile Money and financial inclusion. The chapter describes what the whole notion of Mobile Money and financial inclusion entails. It also outlines the theoretical structure for financial inclusion through Mobile Money and Non-bank Financial Institutions. Finally, the chapter discusses and explains the financial markets in Lesotho.

Chapter 3: In essence, this chapter focuses on the methodology of the study, it explains the type of research study used and the measures involved in the analysis of the results. This chapter describes the research design, population and data sampling, primary and secondary data collection, data analysis and, ultimately, empirical analysis.

Chapter 4: This chapter illustrates and explains the interpretation of data in the study. It also presents and discusses the outcomes and the actual findings of the data.

Chapter 5: Essentially, this chapter discusses the conclusions, suggestions and limitations based on actual results of the study, also taking into account previous studies.

CHAPTER 2:
LITERATURE REVIEW

2.1 INTRODUCTION

This section will look in-depth at what depicts financial inclusion and its effectiveness in African countries, particularly developing countries. It will focus on the different methods being introduced to address, and ideally eliminate, financial exclusion. These mechanisms include banking, micro-financing, small savings associations (stokvels), informal financial services, as well as Mobile Money. The literature will also look at the challenges and benefits of utilising all these financial systems as tools to alleviate financial exclusion in small countries like Lesotho, a country where a considerable portion of its populace reside in remote rural areas and has practically no access to banking services.

2.2 DEFINITION OF CONCEPTS: MOBILE MONEY AND FINANCIAL INCLUSION

Financial literacy is considered to be a fundamental aspect of financial inclusion; Individuals need to understand and be well-informed about the business products or services they choose to engage with. People need to understand that being financially included does not only mean they have a basic bank account for transacting and receiving remittances, but that they also have access to a whole range of other banking products and services.

Through the use of mobile financial services, these days one can easily be financially included. Such services are easily initiated and are user-friendly to all sections of the population, including those with a low income or those living in rural areas. Access to financial services and products can help mitigate poverty for the low-income and rural communities in Lesotho.

The factors contributing to a robust financial system have been of great interest to individuals and economies around the world. Many studies have been done to find a solution to the problem

of financial exclusion. Consequently, financial regulators, governments and the banking sector worldwide have taken steps to develop and upgrade numerous growth ideas towards financial inclusion (Sekantsi & Motelle, 2016). Financial inclusion has been characterised and reclassified throughout the years; it is described as the conveyance of banking services to the vast segments of disadvantaged and low-income groups at an affordable cost (Leeladhar, 2005).

The scholar, Thorat (2007) also defines financial inclusion as the provision of affordable financial services by the formal financial system to those individuals who are likely to be financially excluded. In any case, each of these concepts leads to one logical conclusion: Financial inclusion ensures accessibility and utilisation of financial services to all individuals of the economy. Numerous scholarly literary works have been done on the role of financial development and economic growth; many believe evolved financial systems will help advance economic growth (Levine, 2007). Empirical studies have identified a unique link between financial inclusion and economic growth (Eita & Jordaan, 2007).

2.3 FINANCIAL INCLUSION CONSTRAINTS

Emphasis on financial inclusion has been significantly expanded by the regulators, banks, NGOs, and individuals. Advocates of development finance are going to the degree of making financial inclusion a sovereign right for each member of the economy. Be that as it may, there are demand- and supply-side constraints linked to it (Singh, 2014). For one, a large proportion of the general public is excluded from financial services, such as credit, loans, insurance, financial education, remittances, and pensions (Collins *et al.*, 2009).

For low-income individuals and the rural populace, informal methods may serve the purpose, but they can also be expensive and have various unpleasant consequences. For this reason, mobile banking seems to be the most pragmatic solution. However, the constraints that apply

to the demand side, include that there is little awareness about the financial system, the products and the services. The price of the products may also be unreasonably high for low-income individuals, not to mention the lack of trust in banks (Singh, 2014).

Some of the constraints that have been identified for financial inclusion are issues that can be well managed by an economy that is making progress toward a comprehensive economic system. Generally speaking, people living in rural areas may want a bank account, but various conditions limit them, such as inaccessibility due to the long distances they need to travel to get to financial institutions, since there are often no service points in the area. Low-income people consider formal financial services rather expensive and inconvenient for them, so they would instead accumulate their money under their pillows than trust it to the banks (Central Bank of Lesotho, 2016). Additionally, formal financial services often demonstrate inadequate product plans, leading to solutions that fail to address the needs of financially excluded clients.

Another challenge is that the majority of rural, low-income persons fail to meet the eligibility criteria set by financial institutions, for example, not having adequate assets to offer as collateral when applying for a loan. Some fail to present the required documentation confirming their identity (Central Bank of Lesotho, 2016). The lengthy, daunting list of paperwork and procedures that customers must go through to open a basic bank account often discourages individuals, in light of their limited education and numeracy. Information asymmetry due to lack of knowledge on the part of client, and the inconvenient opening and closing times of banks, may also exclude clients from certain sections of the population (Gwalani & Parkhi, 2014). The banking system does not make it simple for the financially excluded population.

On the other hand, those few individuals who were initially banked or utilised formal financial services may choose to relinquish their accounts over the long term due to the staggering costs involved in sustaining them. Individuals also lose trust and confidence in the banking system

and feel they are better off without these services. Fundamental administrative procedures requiring financial service providers to apply strict disclosure regulations are sometimes not complied with. Failure to meet the criteria prevents customers from becoming part of the formal financial system (Central Bank of Lesotho, 2013).

Consequently, despite the increased efforts to develop access to, and use of, financial inclusion services, most emerging markets continue to experience the adverse effects of financial exclusion, with the vast majority of their population still unbanked.

2.4 THEORETICAL FRAMEWORK: MOBILE MONEY AND FINANCIAL INCLUSION

Financial intermediation is the role in which the banking sector generally dominates, with virtually no or little opportunity for Non-bank Financial Institutions to enter. This is the mechanism that banks follow to accept deposits from customers, and then loan them out to borrowers. The banking business has flourished on the financial intermediation capabilities of financial institutions that allow them to lend cash at moderately high interest rates, while receiving deposits at comparatively low interest rates.

Sinha (2001) identifies financial intermediation as a mechanism by which funds are directed from surplus savers to deficit spenders through sector-created instruments, such as financial institutions. Sinha (2001, pp.1-8) adds that "it is an after-effect of intentional policy decisions that build and enable resources to fulfil everyday needs and demands".

This is not the case in developing countries such as Lesotho; either due to the topology or the relative evolution of the financial system (Finmark Trust, 2017).

Non-bank Financial Intermediaries have left an unprecedented mark on the Lesotho financial system. These institutions sprang up in the country, particularly in rural regions, providing an efficient financing system, while at the same time bridging the unattended gap left by the

banking sector in rural areas. Accordingly, Lesotho ranks high in terms of financial inclusion, owing, for example, to the plurality of services offered by informal and supplementary financial sector institutions (Mabote, 2017). Nonetheless, prudential regulation also needs to be streamlined by the authorities to reduce the risk that may arise from the services offered by Non-bank Financial Institutions in their entirety.

The role of financial institutions in financial intermediation seems to erode with changes in technology, globalisation and growth of the financial markets, because information is now readily accessible. The banking sector has expertly played the role of financial intermediation, while informal financial institutions have become prominent in informal, rural settings where banking services are not available (Finmark Trust, 2017).

In South Africa, the general pattern of credit growth has negated what has been seen in various emerging countries; however, it coordinates with that of many developed economies. Before the 2008 global banking crisis, there was an enormous increment in the private sector credit extension which was driven by home-loan lending (mortgages), which escalated the prices of homes. The government, as a result, was very satisfied with the increase in revenues, which allowed it to post small fiscal surpluses. Following the crisis, the budgetary policy changed to making deficits of about 5% of GDP (SARB, 2014).

Private sector credit development, by contrast, declined as banks raised loaning standards, and households consolidated their balance sheets. South Africa's shadow banking system expanded, growing from approximately 13% of the financial assets of all financial intermediaries to 18% by the end of 2014, which is still a moderately small part of the financial system. Over half of the shadow banking system comprises of money market funds, which are regulated and therefore, not evidently 'shadowy' (SARB, 2014).

2.4.1 Financial inclusion through Non-bank Financial Intermediaries (NBFIs)

The banking sector may have been viewed as the core of financial intermediation, but this has changed as NBFIs grew. The NBFIs have steadily assumed the more prominent role of crucial economic growth players in both developed and emerging markets (Finmark Trust, 2017). Non-bank Financial firms identify themselves as financial institutions providing specific banking services, even though they have no banking license. No such institutions are permitted to accept public deposits, and this rules them out of the scope of customary supervision, which is compulsory under banking regulations (Finmark Trust, 2017).

Each of these institutions plays an essential role in promoting financial services such as savings and credit for the country's unbanked and low-income population. Services range from leasing, factoring and venture capital to a variety of contract investments and institutional investors such as pension funds, insurance companies, and mutual funds. Sub-sector construction varies according to the level of a country's financial enhancement (Finmark Trust, 2017).

The activities of the Lesotho sub-sector are governed by the Financial Institutions Act 2012 and the 1976 Insurance Act, as amended in 2014.

2.4.2 The role of Non-bank Financial Intermediaries in financial inclusion

The NBFIs have played a significant role in bringing financial services closer to the unbanked and low-income people that the banking sector could not reach. They instigated deposit and credit services for the disadvantaged. Their most critical task is to provide financial assistance to the underprivileged by transferring funds from savers to investors (Finmark Trust, 2017). Such institutions gained prominence because of their capability of fulfilling the various financial requirements of individuals living in locations in which banks are reluctant to work (Gupta *et al.*, 2013). The NBFIs fund medium- and long-term projects that would otherwise not be funded by the conventional finance sector, due to high credit or business risks.

NBFIs also promote long-term investment and financing not available for low-income individuals in the banking sector; they extend the product range available to individuals and institutions with investment capital (Gupta *et al.,* 2013). In addition to providing the demand side of the funds, Non-bank Financial Intermediaries also offer an alternative financing sector. They complement the activities of the commercial banks and provide the requisite competition in being more productive and open to the needs of the customers (Vittas, 1999). Countries, such as Nigeria, fully recognise the role of Non-bank Financial Institutions in the financial intermediation process (Nwakoby & Ananwude, 2016).

There is no doubt that an efficient and well-developed financial system is required to advance economic growth. The US considers Non-bank Financial Institutions to be shadow banks. There is an unmistakable concentration of shadow banking in the USA, and these institutions also operate in the UK, Europe, and China (Nwakoby & Ananwude, 2016).

For maturity transformation, Non-bank Financial Institutions do much better than commercial banks when using deposits, which usually involved the short-term funding of longer-term loans.

NBFIs are also portrayed as individuals, entities, associations or groups of persons, irrespective of whether they are corporate or not. Their main functions include factoring, project financing, equipment leasing, debt management, fund management, private ledger services, investment management, local purchase order financing, export financing, pension fund management and other services that the bank may authorise from time to time (The Nigeria Bank and other Financial Institutions Act, 1990).

An indication from Malaysian experience shows that NBFIs have contributed to the real improvement of GDP per capita by raising investment (Mabote, 2017). For example, NBFIs have advanced economic growth by providing long-term funding for productive investment

projects where funding from the traditional banking system was restricted. They have also facilitated the growth of small and medium-sized companies that had historically been excluded, enabling them to meet financial requirements to invest in the stock market and also be a part of the commercial banking system (Mabote, 2017).

The following figure shows the percentage of supply and receivable credit in Lesotho.

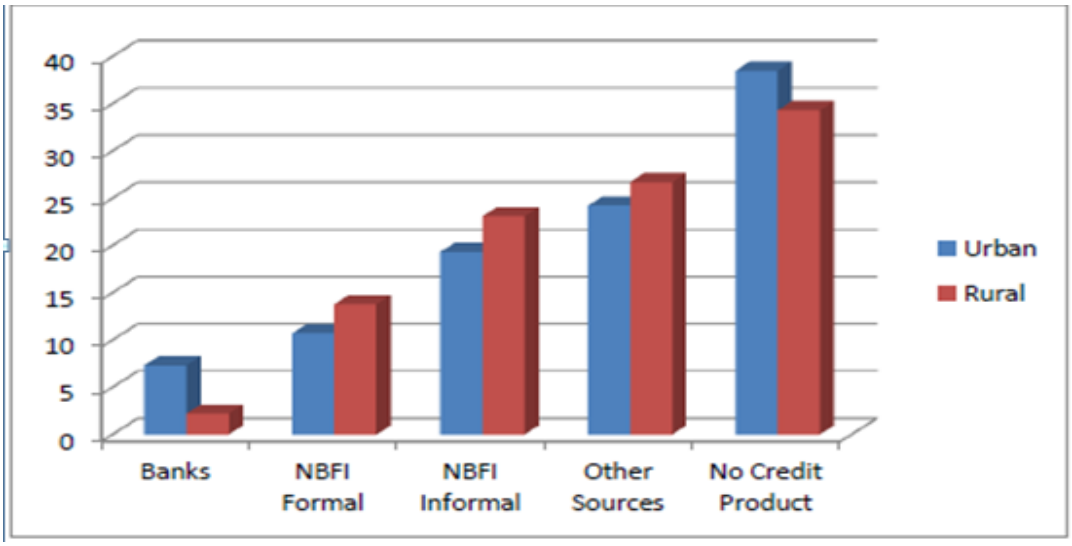


Figure 2.1: Percentage credit allocation by source and receiver

Source: Finmark Trust (2017)

The no-credit package reflects financial institutions that have no credit offerings. Non-bank Financial Intermediaries play a crucial role in financial inclusion by serving the under-banked communities, rural populations, and low-income individuals, as well as small, medium, and micro-businesses.

As with other developing countries, the commercial banks in Lesotho are concentrated mainly in the urban areas. The situation suggests that rural people do not have access to full financial services that the urban population benefit from. Accordingly, the NBFIs offer services to the disadvantaged that commercial banks do not provide. The system is not only for rural residents but also covers those excluded because of their financial status or historical background and interests.

2.5 FINANCIAL INCLUSION THROUGH AFFORDABLE SAVINGS

The banking sector has one essential service, namely, direct lending and saving, which is most common in financial services and is easily accessible for those with steady incomes in urban areas. Rural and low-income communities, which make up a significant proportion of Lesotho's population, lack access to this service. The Finmark report affirms this perception by proving that in 2012/13 the total informal deposit loan book stood at M400 million; this accounted for about 15% of the financial savings in banks (Finmark Trust, 2017).

By covering banking services and increasing the number of clients served by their operations, NBFIs continue to demonstrate their importance to the general population. The table below lists provider savings holdings and illustrates that NBFI operations reached about 400 000 customers, with informal institutions serving over 300 000 of the total. These institutions comprise primarily of community-based collective savings schemes to activate cumulative savings.

Table 2.1: Holdings of savings by provider

Type of institution	Approximate no. of customers
Banking sector	368 000
Pension fund	45 000
Savings and credit cooperatives	41 000
Informal groups	304 500
Others	3 234

Source: CBL, various reports and author's own calculations

2.5.1 Collective saving schemes and MFIs

Through the microfinance institutions and collective saving schemes, the savings activated by the banking sector are complemented by those mobilised to the financial needs of the

community. These institutions are entitled to accept deposits from their customers (Finmark Trust, 2017).

According to Mabote (2017,p.14), "Lesotho has developed a culture of mutual institutions such as burial societies and small savings clubs that include NGOs, savings and credit cooperatives, associations for village savings and loans, rural savings and credit groups". Although these institutions offer financial resources to their members, they also provide social and emotional support to maintain the resilience to address the daily economic challenges that members may experience (Mabote, 2017).

2.6 FINANCIAL INCLUSION THROUGH AFFORDABLE CREDIT

Credit is also one of the dominant functions of financial services that stimulate economic growth, and is widely provided by a variety of financial sector players; be it formal or informal. The financial system has always struggled to effectively offer services to rural and low-income persons. Only 16.6% of adults received credit from formal banking, with commercial banks serving 3.8% in 2013 (Fin Mark, 2014).

The service has undoubtedly benefited clients with a regular income in the form of monthly salaries, which are held as collateral. The service has progressed over the years, perhaps due to ongoing policy changes such as the amended Land Act of 2010, which takes into account land as collateral, and marriage equality, allowing married women access to credit without the consent of the spouse (Finmark Trust, 2017).

2.7 OVERVIEW OF FINANCIAL MARKETS IN LESOTHO

Three decades ago, the launch of the first commercial mobile phone networks saw unprecedented growth in mobile communications around the world. Since 2005 total mobile penetration has increased dramatically in all parts of the world (GSMA, 2016).

As indicated by the GSMA (Global System for Mobile Communications) (2016), the mobile industry continues to scale rapidly, and globally there were 3.6 billion unique mobile subscribers towards the end of 2014. The GSMA, also added that half of the world's population currently has a mobile subscription, and an extra one billion subscribers are anticipated by 2020, taking the worldwide infiltration rate to roughly 60%.

The use of fixed lines has decreased, since they remain underdeveloped and unavailable to the majority of the population in developing countries. In the 21st century, low-income countries have been seeing growth rates in mobile adoption more than twice as fast as those of high-income countries (GSMA, 2012b).

In Lesotho, the number of Mobile Money customers registered has continued to increase since the establishment of Mobile Money. Given the estimated population of 1 880 661 people in 2006, the number of Mobile Money customers subscribed rose from 10% in June 2013 to around 57% in December 2016. Similarly, the number of agents improved significantly from 337 in June 2013 to 3 654 in December 2016 (Finmark Trust, 2017).

The figure below shows the number of customers and agents that were registered for Mobile Money in Lesotho from 2013 to 2015.

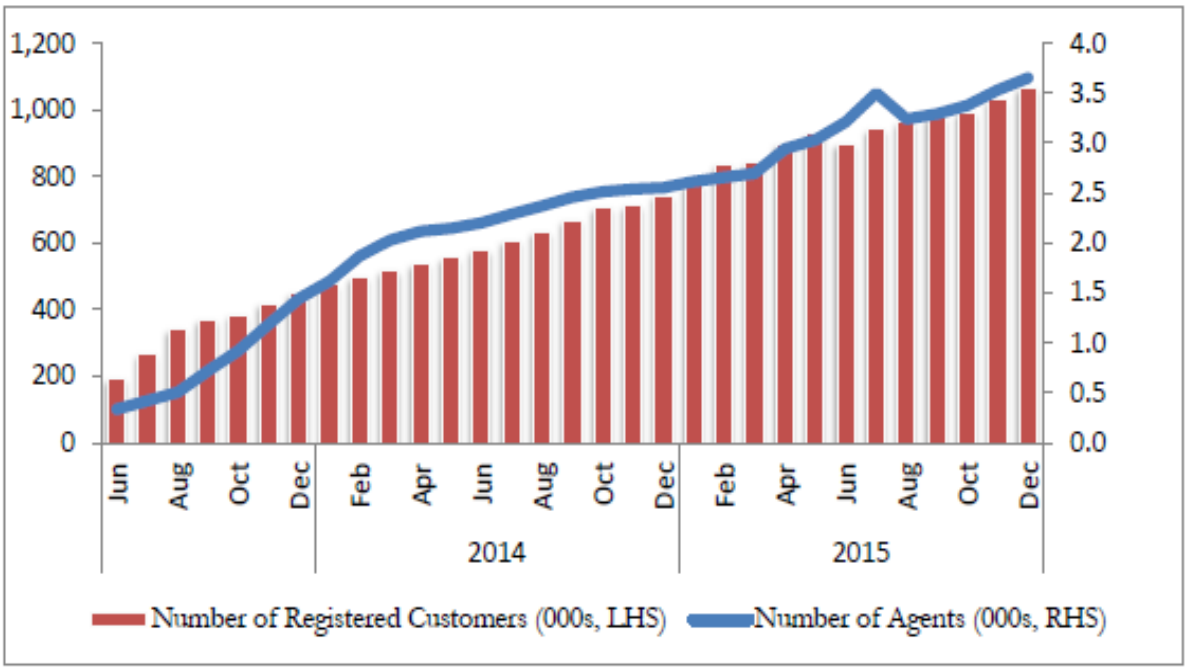


Figure 2.2: Customers and agents of Mobile Money

Source: Finmark Trust, 2017

Mobile Money services were introduced by Econet Telecom Lesotho and Vodacom Lesotho to mitigate financial exclusion and establish economic expansion in Lesotho. Mobile Money transaction rates, in particular withdrawals from the bank, account payments, domestic money transfers and airtime transactions, have been maintaining a constant upward trend since the creation of the service.

A Central Bank of Lesotho (CBL) report (Finmark Trust, 2017) revealed that as of December 2016, a total of 751 743 airtime transactions, 243 169 cash withdrawals, 321 768 account payments and 221 257 money transfers were carried out via Mobile Money. On the contrary, its use in wage processing remained restricted, despite its potential to lessen the barriers in processing wages of contract and casual workers by numerous associations in the country, the Lesotho government (GoL) included.

The high take-up and use of Mobile Money also correlate with the growth of the MNOs ' trust account balance. “Slow growth in the adoption and use of Mobile Money in Lesotho is attributable to slow product acceptance especially by urban users, and weak efforts by MNOs

to advertise and inform customers about the product's services" (Central Bank of Lesotho, 2016).

The following figure shows the volume of transactions by Mobile Money (in thousands of Maloti).

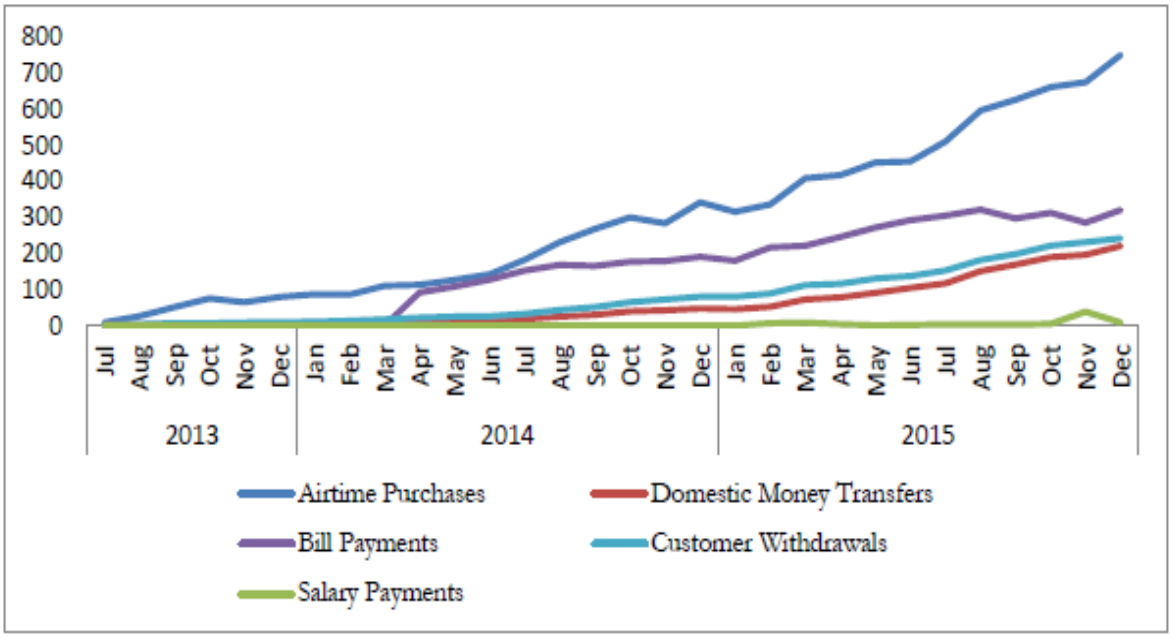


Figure 2.3: Mobile Money transactions

Source: Central Bank of Lesotho

It is disappointing that Mobile Money continues to be used more in urban districts than in rural regions, where there is a significant gap in financial inclusion and a strong need for financial services. This situation is attributed to the restricted banking infrastructure of MNOs to reach rural areas, lack of consumer awareness, poor rural mobile network, and inaccessibility to some rural regions because of the mountainous terrain (Central Bank of Lesotho, 2016).

The following figure shows the number of Mobile Money agents in each district

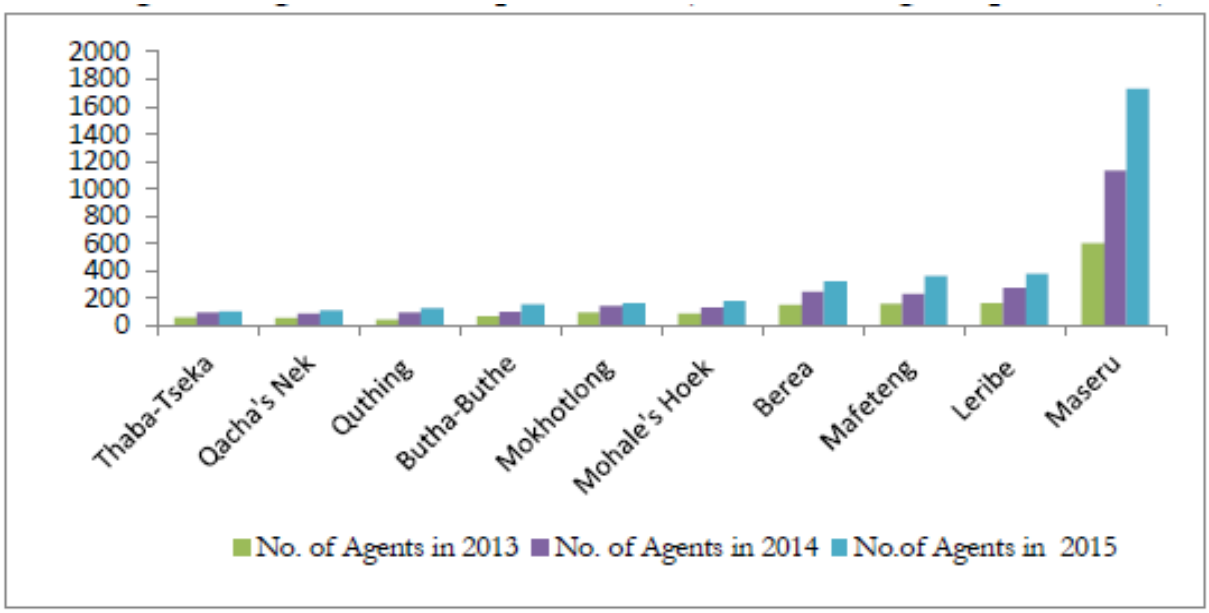


Figure 2.4: Number of agents in Mobile Money

Source: Central Bank of Lesotho

There is still an apparent need for more initiatives from MNOs to increase consumer awareness on Mobile Money and to increase the recruitment of agents in rural areas. Also, MNOs should promote the use of Mobile Money in its electronic form. This initiative will solve liquidity issues for agents, as clients will not have to convert their Mobile Money into cash before carrying out transactions.

The following table shows how Mobile Money has increased relative to other Non-bank Financial Services, serving about half a million rural and urban customers.

Table 2.2: Mobile Money services

Types of Institution	Approximate no. of customers
TEBA	22,000*
Mobile Money	500,000

Source: CBL Reports

Furthermore, the service was enhanced through the integration of cross-border transfers in partnership with some retail outlets in both Lesotho and South Africa. Mobile Money also

supports migrant miners who earn their deferred payment money through the service (Finmark Trust, 2017). All these services offered enable clients to access financial services, thus enhancing the quality of the country's financial inclusion.

CHAPTER 3:
METHODOLOGY

3.1 INTRODUCTION

The methodology chapter entails the basic methods and designs actualised in the research evaluation process to arrive at the ultimate results. A research methodology is specific procedures or techniques used to identify, select, process, and analyse information about a topic (Wits University Library).

In a research paper, the methodology section enables the reader to critically assess a study's overall legitimacy and reliability. This chapter's main purpose is to respond to two primary questions: How was the data collected or produced? and How was it analysed?

The section will, therefore, adopt the following structure: research design, population and sample, methods of collecting data, and data analysis methods.

3.2 RESEARCH DESIGN

There are three main types of research a researcher can choose from with regards to what a study is trying to achieve. Research methods are grouped into the following categories: exploratory, descriptive, causal, and evaluation, of which each has its particular research base. This study is based on causal and explanatory research. The second crucial point of view in research topology is the type of data that a researcher decides to implement to find answers to their research questions. The study can adopt one of two data methods: quantitative data or qualitative data. This study will be quantitatively based.

3.2.1 Causal research

The study employs both causal and descriptive analysis to establish a relationship or linkage between the development of mobile financial services and financial inclusion in Lesotho. The key highlight in a causal study is to find or develop the presence of a

relationship/connection/interdependence between two or more aspects of a situation (Kumar, 2011). Causal studies, also referred to as analytical research is carried out to recognise the degree and nature of cause-and-effect relationships; the focal point of these studies is an analysis of a situation or a specific issue to explain the patterns of connections between variables (Dudovskiy, 2018).

In this particular study, descriptive causal research was employed to assess the impact of the growing mobile financial services on financial inclusion in Lesotho's weak economy. The motivation behind the decision to engage this type of study was as follows: Firstly, causal studies may assume an influential role in terms of recognising explanations for a wide range of processes, as well as evaluating the effects of changes on existing standards and procedures. Furthermore, causal studies typically offer the upside of replication when required. Lastly, these types of studies link with higher levels of internal legitimacy because of the systematic determination of subjects (Dudovskiy, 2018).

The downsides associated with this type of study are coincidences in events that may be believed to be cause-and-effect relationships. Also, it can be tricky to reach appropriate conclusions based on causal research findings; this is because of the impact of a wide variety of factors and variables in the economic environment. In other words, while inferring causality is possible, it is highly difficult to prove it with a high level of assurance (Dudovskiy, 2018).

3.2.2 Quantitative data

Analysis of data through quantitative studies involves critical analysis and understanding of figures and numbers and attempts to determine the validation behind the materialisation of main findings. Comparisons of primary research findings to the results of the literature review are significantly imperative for both qualitative and quantitative studies (Dudovskiy, 2018).

A remarkable component of quantitative data is that the representation of evidence is in numbers and large quantities. The quantitative data-collection strategies are based on mathematical calculations in various formats. The methods of quantitative data collection and analysis incorporate questionnaires with close-ended or open-ended questions, techniques of correlation and regression, mean, mode, median, and others (Dudovskiy, 2018). Quantitative methods are less expensive to implement in comparison to qualitative methods. Additionally, as a result of the high level of standardisation of quantitative methods, it is simple to make comparisons of a variety of findings.

Nonetheless, it must be stressed that most of the social science studies, of which this research is one, are qualitative, although they may be interpreted quantitatively or by numbers. The numbers represent labels that are connected to the evaluation of the question or subject matter by each respondent. Hence, more often than not, the examined primary variable, regardless of being represented numerically, remains qualitative (Bhattacherjee, 2012).

3.3 POPULATION AND SAMPLING OF DATA

This research was conducted in the Lesotho Kingdom, a mountainous country divided into urban and rural areas. Understandably, individuals living in these two different regions endure unique challenges concerning financial issues and other economic issues in the country. When deciding on a sample selection, a researcher must endeavour to choose a sample that is unbiased and represents the population. The objective of sampling in quantitative research is to make conclusions about the population from which one has selected the sample (Kumar, 2011).

The sample (a subgroup of the total population) for this study was selected from both urban and rural regions to capture unbiased information from both groups. The advantage of selecting a few individuals (sample) from a larger group is that it saves time; it is cost-effective and saves human resources. The drawback, however, is that a researcher does not discover essential

information about the population's characteristics, which is of interest, but can only be estimated or predicted. Hence, there may be the likelihood of an existing error in the estimations (Kumar, 2011).

In practice, results based on larger samples are more reliable than those dependent on smaller ones. To achieve a larger sample, however, can be costly and time-consuming. For example, distributing a large number of questionnaires by drop-in and pick-up to numerous people in different areas requires funding for printing and transport expenses. For this research, simple random sampling was employed to select participants. This method is applied if each person in the population has an equal and independent selection opportunity in the sample. Random/probability sampling is advantageous because it generates a sample that most accurately represents the total population. Inferences drawn from such a sample apply to the overall sampling population. Furthermore, some statistical tests dependent on the theory of probability can be performed only to data collected from random samples; some of these tests are significant for establishing conclusive correlations (Kumar, 2011).

This study employed a sample size of 120. The next section explains how the sample size was objectively deduced.

3.3.1 Calculating the Sample Size:

This study used the sample size determination formula used by Penwarden (2014). According to the authors, the determination of an appropriate sample size must take cognisance of the expected margin of error and the desired confidence level. The margin of error is defined as the range below and above the sample statistic in a confidence interval (Glen, 2014). The confidence level describes the degree of certainty the researcher has that their results are accurate (Penwarden, 2014). Conventionally, many studies use a margin error of 5%, and therefore, a confidence level of 95% (Penwarden & Glen, 2014).

This study used a confidence interval of 90% and an error margin of 7.5%, which was deemed appropriate for this study due to the short time period of the research and the financial resources required to complete this research. Therefore, adding these parameters yielded a sample size of 120 Mobile Money users:

$$\text{Sample Size} = \frac{Distribution\ of\ 50\%}{(margin\ error\ \% \div confidence\ level\ score)^2} = \frac{0.5(1-0.5)}{(0.075 \div 1.645)^2} = \mathbf{120.267}$$

The sample included Mobile Money users from the lowlands (Maseru, Mafeteng and Berea), as well as the mountains (Thaba-Tseka, Quthing and Mokhotlong). The sample included 55 males, 59 females, 52 urban dwellers, 62 rural dwellers, 29 unemployed persons, 52 employed persons, 33 self-employed persons, and 26 youth.

Of the total of 120 questionnaires that were distributed, 114 questionnaires were completed and used for the study. The aim was to try to find as many users of the Mobile Money market with diverse preferences as possible, while simultaneously attempting to make the selection process unbiased.

There are approximately 376 631 registered M-Pesa users and about 968 482 registered Eco-cash users in Lesotho. Overall, this gives a population of roughly 1 345 114 registered Mobile Money users in Lesotho (Central Bank of Lesotho, 2018).

3.4 PRIMARY AND SECONDARY DATA COLLECTION

Primary data that was collected using questionnaires formed the foundation of the data that was collected for this study. However, secondary data that was accessed from the Central Bank of Lesotho (CBL) from the period July 2013 to July 2019 was also used for additional empirical analysis.

A questionnaire is a list of questions, the answers to which are recorded by participants, after reading the questions, and interpreting what is required (Kumar, 2011). Structured

questionnaires were distributed across both rural and urban areas to review the different challenges and/or benefits encountered by both parties in the various regions regarding the development of mobile financial services in the country. Since there is usually no one to clarify or explicitly explain questions to respondents in the case of a questionnaire, it was therefore imperative that the questions were clear and straightforward. Similarly, the format of the survey had to be in such a manner that it was simple and pleasing to the eye to circumvent respondents being hesitant to take part (Kumar, 2011).

Different types of questions are generally included in a questionnaire. The questionnaire for this study included the following particular types of questions:

- Multiple-choice questions: several possible answers are given to the respondents to select what they feel is the most accurate for them;
- Dichotomous questions: only two alternatives are provided to the respondents, namely, yes or no; and
- Scaling/ranking questions: they present a possibility for respondents to rank the offered responses to the items on the scale given a range of values (for example from 1 to 5).

Questionnaires are useful when a large amount of data has to be gathered in a short period of time. The advantages of surveys include the fact that participants of the sampled group can stay anonymous. They are significantly cheaper and have high levels of objectivity relative to many alternative methods of data collection.

Questionnaires, however, have some shortcomings, which include the possibility of not being able to guarantee that significant insight will be gained from the research. Also, the selections of random answer choices by respondents who may not have the correct understanding of the question, may affect results (Dodovskiy, 2018). (See the Questionnaire in Appendix B.)

3.5 DATA ANALYSIS

After collection, the data was prepared for analysis. Since descriptive analysis was used for analysing the primary survey data, the preparation included grouping the data accordingly. Descriptive analyses are used to define the basic characteristics of the data in a sample. They give a quick description of the study and the steps taken. Together with simple graphical analysis, they form the basis of virtually any quantitative analysis of the data. Descriptive analyses present quantitative explanations in a manageable format.

Data analysis was completed through the utilisation of Microsoft Excel spreadsheets as well as E-views; the construction of frequencies, plots, graphs, charts and lists was through the application of the software. During the data-collection process, it was vital to determine a way of minimising anomalies, such as checking questionnaires with blank responses and calling the respondents to provide the missing information. It was, however, permissible for a respondent to tick/pick two or more answers, depending on what the question required.

The coding of the data, which was the subsequent step, was actualised by typing the data into the system and then editing the data. Data was compiled to check for anomalies, blank responses, and contradictions. The data coding involved assigning a number to the answers of the respondents as a requirement for database entry on a separate sheet or in Microsoft Excel.

The advantage of using Microsoft Excel is that it is cost-effective and commonly available. It is user-friendly and can be sent as email attachments and viewed by most mobile smartphones. The drawbacks are that large Excel files may run slowly, and that the advanced analysis functions can be time-consuming for inexperienced users. However, using E-views is beneficial in that it has a broad exposure of formulas and mathematical practices, importation of data files can be done from other software programs, and it is annually updated to enhance

sophistication. The E-views student version can also be used for free by students. The software's disadvantage, however, is that it can be complicated for first-time users.

3.6 EMPIRICAL ANALYSIS

This section presents a discussion of the variables applicable to the study and the estimation approach that was employed in the study.

3.6.1 Measurement and description of variables

For the purpose of making inferences, quantitative methods were used to assess the relationship between Mobile Money and Financial Inclusion. Because Financial Inclusion and Mobile Money cannot be calculated directly, they had to be measured in terms of proxies, as discussed below.

Time-series data were employed to check for Co-integration and Unit Roots to validate any long-term relationship between Mobile Money and Financial Inclusion. To check for co-integration, The Granger causality and the Autoregressive Distributed Lag (ARDL) bounds tests were used. To test for Unit Roots, the Phillips and Perron (1988), and the Augmented Dickey-Fuller tests were incorporated in the study. The Unit root tests measure the order of integration of the variables. If a variable is integrated of order 0, it is labelled I(0), which indicates that the series is stationary in level; if I(1), it is stationary in first difference, and so on.

Table 3.1 presents a summary of the variables applicable to the present study.

Table 3.1: Description of variables

Variable	Measurement per 100 000 adults (> 18 years)	Description	Source
Dependent variable: Financial Inclusion (FIt)	Total deposits per 100 000 adults (e.g. Sekantsi, 2016)	Aggregate deposits retained by commercial banks divided by adults of 100 000.	CBL
	Total credit per 100 000 adults(e.g. Sekantsi, 2016)	Total credit extended by commercial banks divided by 100 000 adults	CBL
	Number of ATMs per 100 000 adults (e.g. Motelle, 2016)	The number of ATMs divided by 100 000 adults.	CBL
	The number of bank branches per 100 000 adults (e.g. Motelle, 2016)	The number of bank branches divided by 100 000 adults.	CBL
Independent variable: Mobile Money (MMt)	Mobile Money transactions per 100 000 adults (e.g. Sekantsi, 2016)	E.g., Airtime sales, domestic money transfers, withdrawals from customers and deposits, divided by 100 000 adults each.	CBL
	Number of registered Mobile Money customers per 100 000 adults (e.g. Motelle, 2016)	The total number of registered users for both M-Pesa and Eco-Cash divided by 100 000.	CBL
	Mobile Money Outlets per 100 000 adults (e.g. Sekantsi, 2016)	The total number of Mobile Money outlets and divided by 100 000 adults.	CBL
	Number of Mobile Money Agents per 100 000 adults (e.g. Motelle, 2016)	The number of Mobile Money agents divided by 100 000 adults	CBL

3.6.2 Estimation approach

The Augmented Dickey-Fuller and Phillips Perron tests

The study incorporated two equations to accurately evaluate the relationship between financial inclusion and Mobile Money. First, it was necessary to determine the order of integration of the variables involved, using the Augmented Dickey-Fuller and the Phillips and Perron tests.

In addition to the ADF test, the Phillips and Perron (1988) analysis was applied because it takes into account the serial correlation, the endogeneity of regressors and also allows for the possibility of heteroscedastic error terms (Hamilton, 1994). Although the Autoregressive Distributed Lag (ARDL) bounds testing also tests the existence of I(0), I(1) or mixed integrated variables in the estimation, pre-testing for the variables integration order guarantees the absence of I(2), the presence of which would nullify the entire procedure.

The use of the ARDL bounds testing method for co-integration (Pesaran & Shin, 1999) took place after determining the order of integration of the variables to establish the presence of a long-run relationship between Mobile Money and Financial Inclusion.

Autoregressive Distributed Lag (ARDL) bounds and Granger causality tests

The ARDL bounds testing is preferable to other co-integration methods owing to several factors: The ARDL bounds test stays applicable regardless of whether the included variables are I(0), I(1), or mutually co-integrated (Sekantsi & Motelle, 2006). This method remains valid even for examining co-integration in empirical macroeconomic studies where small sample sizes are standard. The ARDL method also has finite-sample critical values that other procedures need, for which the distribution of the test statistics may be uncertain.

Therefore, this approach typically produces accurate estimates of the long-run model and precise statistics, even when endogenous regressors are present (Sekantsi & Motelle, 2006).

The ARDL model used in this study follows (Odhiambo, 2009). The Autoregressive distributed Lag bounds testing model used in this study is given as:

$$\Delta lnFI_t = \theta_0 + \sum_{i=1}^{p} \theta_{1i} \Delta lnFI_{t-i} + \sum_{i=0}^{p} \theta_{2i} \Delta lnMM_{t-i} + \theta_{3t} \Delta \ln FI_{t-1} + \theta_{4t} \Delta lnMM_{t-1} + \mu_t \quad (1)$$

$$\Delta lnMM_t = \delta_0 + \sum_{i=1}^{p} \delta_{1i} \Delta lnMM_{t-i} + \sum_{i=0}^{p} \delta_{2i} \Delta lnFI_{t-i} + \delta_{3t} \Delta \ln FI_{t-1} + \delta_{4t} \Delta lnMM_{t-1} + \mu_t \quad (2)$$

Where Δ is the first difference operator, *p* is the lag length, δ's and *θ's* are parameters to be estimated, *lnFI* is the log of Financial Inclusion, *lnMM* is the log of Mobile Money and μ_t is a white-noise error term.

Co-integration evaluation between variables occurs through the use of the Wald test (F-statistic) according to the ARDL bounds test approach. The test imposes constraints on the estimated long-run coefficients of a lagged variable level equal to one period. The two sets of critical F- values (lower and upper bounds values) for a given level of significance are derived by Pesaran, Shin and Smith (2001) for large sample sizes, and Narayan (2005) for small samples. The lower bounds values assume that all variables in the ARDL model are I(0), while the upper bounds values suppose that the variables are I(1). Accordingly, if the computed F-statistic is lower than the lower bound, I(0), the null hypothesis of no co-integration cannot be rejected.

On the contrary, if the computed F-statistic goes beyond the upper bound value, I(1), the null hypothesis is rejected, and a accordingly, it concludes that the factors are co-integrated. However, if the F-statistic falls between the two boundaries, the result becomes inconclusive. When there is an establishment of co-integration between the variables through the use of the ARDL bounds testing method, the next step would then be to test the long-run and short-run error correction models from the co-integration regression that has been instituted.

The model used in this study on Granger causality follows the model used in Odhiambo (2007), and Narayan and Smyth (2008). Therefore, the specification on causality between Financial Inclusion and Mobile Money is expressed as follows:

$$\Delta lnFI_t = \theta_0 + \sum_{i=1}^{p} \theta_{1i} \Delta lnFI_{t-i} + \sum_{i=0}^{p} \theta_{2i} \Delta lnMM_{t-i} + ECT_{t-1} + \mu_t \quad (3)$$

$$\Delta lnMM_t = \delta_0 + \sum_{i=1}^{p} \delta_{1i} \Delta lnMM_{t-i} + \sum_{i=0}^{p} \delta_{2i} \Delta lnFI_{t-i} + ECT_{t-1} + \mu_t \quad (4)$$

Where δ's and θ's are the parameters to be estimated, p and m are the lag lengths, and $\boldsymbol{ECT_{t-1}}$ is the lagged error-correction term from the long-run equilibrium relationship, which calculates the velocity of adjustment to the long-run equilibrium after a system. Co-integration among variables may suggest, according to Granger (1969, 1988), the potential existence of causality between variables, in at least one direction. It does not, however, indicate the direction of causality between the variables. Therefore, if there is no co-integration between Mobile Money and financial inclusion using the ARDL bounds test method, the next step would be to use a Granger causality test to determine the causal short-run effects between Mobile Money and financial inclusion.

When co-integration does exist, however, the error correction model will be used to analyse the long-run causality between Mobile Money and financial inclusion. In the test mentioned in Equation (4), the indication of short-run causality is the significance of the t–statistics on the first differences of the lagged independent variable or by the Wald-test of the joint significance of all lagged parameters of the independent variable. On the other hand, the significance of the t-statistic on the coefficient of the lagged error correction term implies causality in the long run.

CHAPTER 4:
DATA ANALYSIS AND RESULTS

4.1 INTRODUCTION

This chapter presents and illustrates the data analysis as well as the research results and findings discussed. As articulated in the methodology, the use of quantitative and qualitative analysis would be focused on primary data collected from questionnaires distributed randomly to a total of 120 individuals. The primary purpose was to find the extent to which the utilisation of Mobile Money helped promote financial inclusion for the unbanked population in Lesotho. A further objective was to establish some of the drawbacks incurred by people using Mobile Money as the only means of attaining financial inclusion. This study has sought to discover the relationship between the development of mobile financial services and financial inclusion.

This chapter will, therefore, be addressing the three main objectives mentioned in the first chapter and hence attempt answers to the research questions as well as the problem statement in question. The first objective, which is the primary objective, is to assess the success of mobile financial services in promoting financial inclusion by reaching the unbanked population in Lesotho. The two secondary goals are to establish the relationship between Mobile Money usage and financial integration in Lesotho and to ascertain benefits realised and challenges faced by Mobile Money service users and operators. As has been pointed out, data were analysed through the use of questionnaires and interviews to identify, describe and explore the impact of Mobile Money as well as its success in financially including a considerable proportion of the population.

4.2 DATA ANALYSIS

For data review, there was preparation for data captured from all 114 questionnaires, which included grouping the data accordingly. The grouping process was done through the utilisation

of Microsoft Excel spreadsheets as well as the Statistical Package for Social Science (SPSS); the construction of frequencies, plots, graphs, charts and lists was through the application of both software packages. The coding of the data involved assigning a number to the respondents' answers on a database entry on a separate sheet or in Microsoft Excel. It was actualised by typing the data into the software and then editing it. The data was then analysed according to the research questions, and objectives pointed out.

4.3 BIOGRAPHIC DATA

This section presents data analysis on the participant's biographic information, the age distribution, the gender distribution, and the location of the participants.

Table 4.1: Gender distribution

Gender	Frequency	Percentage
Male	55	48%
Female	59	52%
Total	114	100%

Table 4.1 above shows that of the 114 individuals who participated, 48% were men, while 52% were women. The percentage shows an almost equal gender distribution of the participants using Mobile Money.

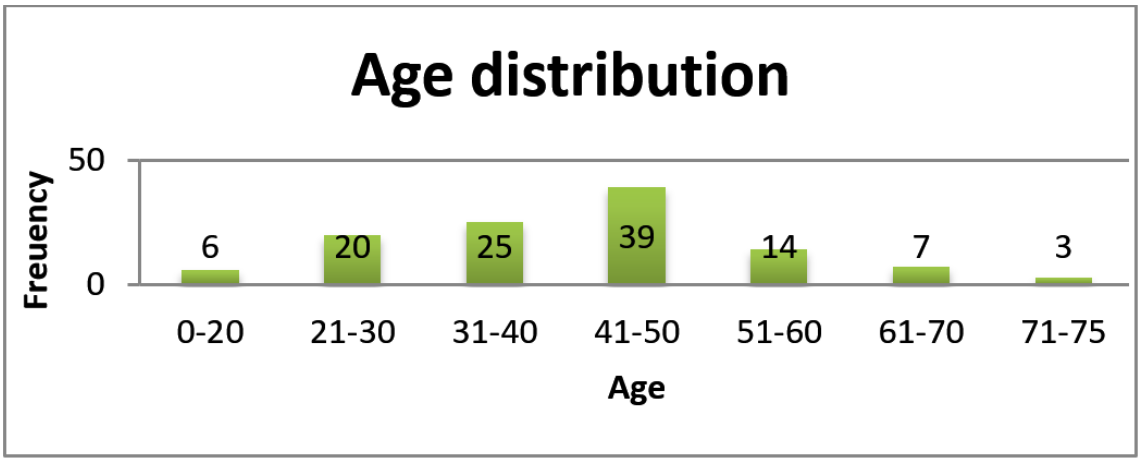


Figure 4.1: Age distribution

The age distribution shows that the most accounted for age group in mobile financial services is the age group of 41-50 which accounts for 34% of the participants, followed by 31-40 at 22%, 21-30 at 18%, 51-60 at 12%, 61-70 at 6%, 0-20 at 5%, and lastly 71-75 at 3%. Individuals in the age group of 41 and 50 are usually the working class, and for simple analysis, we can say the results give us an indication that perhaps most of the people using Mobile Money are those individuals who are still in the working phase of their lives.

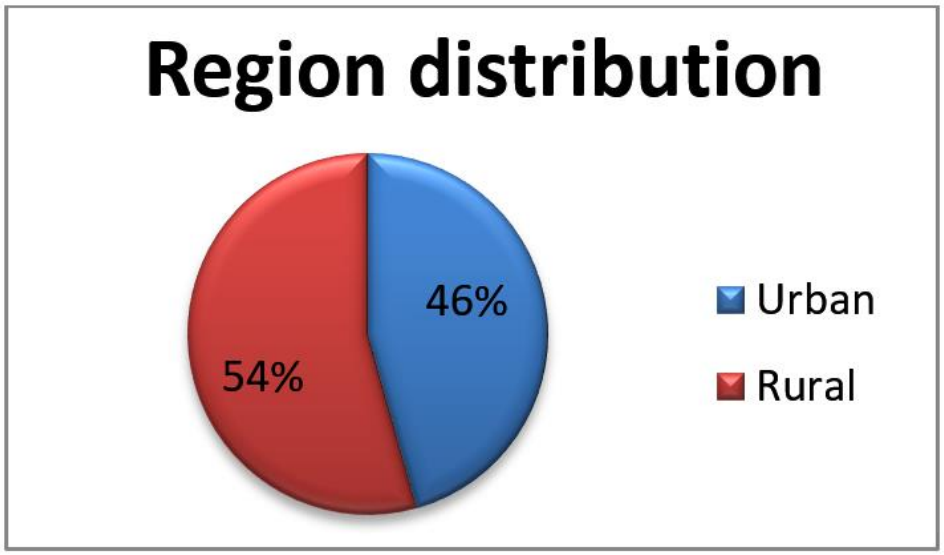


Figure 4.2: Place of residence

Figure 4.2 above shows that 54% of the participants using Mobile Money services reside in urban areas, while 46% reside in rural areas. The distribution shows an 8% difference between the number of people living in urban areas and people living in rural areas using Mobile Money services. This outcome might be because, unlike in urban areas, most people in rural areas do not have bank accounts, and they depend solely on Mobile Money services that are readily available. A significant number of individuals living in urban areas, however, own one or more bank accounts and still prefer using their traditional method of banking, because the availability of bank branches and ATMs is not an issue as it is in rural areas.

4.4 MOBILE MONEY USAGE

This section presents the results of the data analysis on the participant's Mobile Money usage habits. It shows which Mobile Money service each participant uses, the number of money transactions made in a month, how many bank accounts are owned by each participant, and reasons for not using a bank account.

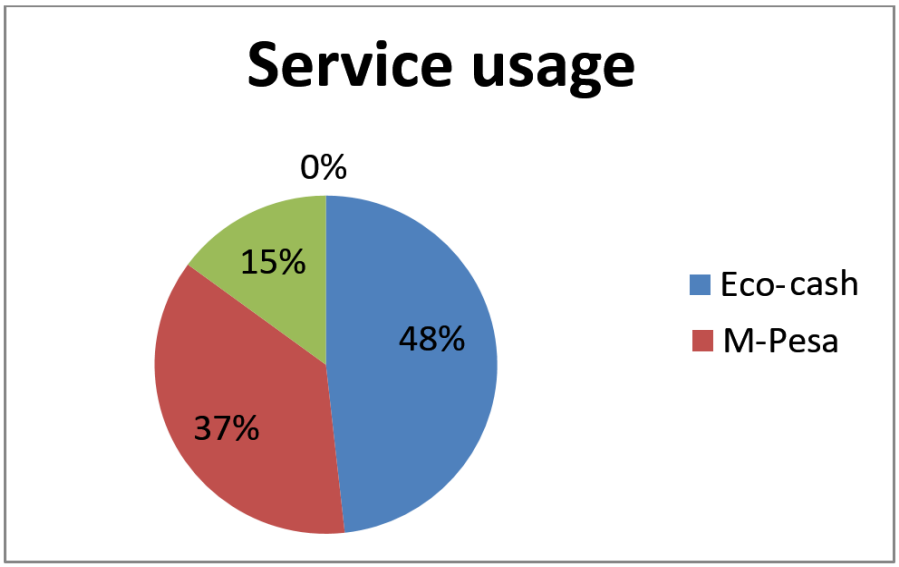


Figure 4.3: Mobile Money services used

The results illustrated in Figure 4.3 show that of the 114 participants using Mobile Money services, 48% use the Eco-cash (Econet Lesotho) service, 37% use M-Pesa (Vodacom) service, while 15% use both services. Amidst the research process, it was ascertained that due to the mountainous terrain in the rural areas, only one of the networks works correctly in some areas.

Most places in rural areas can only connect with the Econet network, while most people in urban areas can either use M-Pesa or Eco-cash. For this reason, people in rural areas mostly use Eco-cash, while people in urban areas can use both.

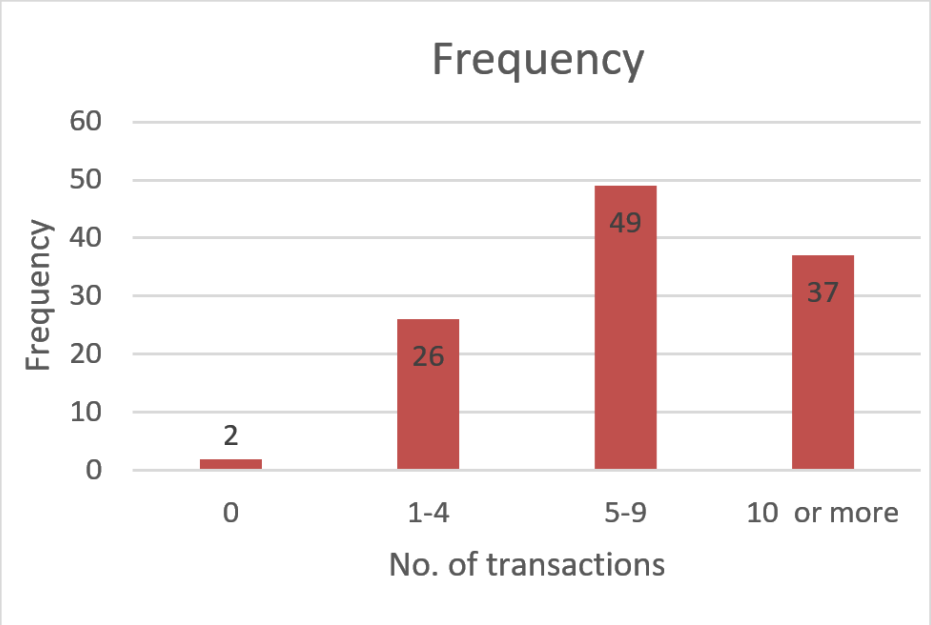


Figure 4.4: Mobile Money transactions per month

The chart shows that out of a total of 114 individuals using Mobile Money services for transactions such as withdrawals, deposits, account payments, airtime purchases and salary purposes, a total of 49 individuals transact through Mobile Money about 5 to 9 times a month, while 37 make transactions 10 or more times a month, 26 confirm that they make transactions 1 to 4 times monthly, and 2 show that they do not make transactions at all. The explanation for the latter is that although the users have registered for Mobile Money services, they have not started depositing or withdrawing money with the platform as yet.

Table 4.2: Number of transactions vs. gender of the participants

No. of transactions monthly	Gender		Total
	Female	Male	
0	0	2	**2**
1-4	7	19	**26**
5-9	28	21	**49**
Ten or more	24	13	37
Total	**59**	**55**	**114**

The table illustrates the number of transactions against the number of female and male participants: it shows that 28 females and 21 males make transactions 5-9 times a month. Seven females and 19 males make transactions 1-4 times a month. Twenty-four females and 13 males make transactions ten or more times a month. It further shows that all female participants make at least one transaction a month, while two males confirmed that they do not make any transactions.

From this table, it is quite apparent that female individuals utilise Mobile Money services more than male individuals each month. This observation is consistent with expectations: Graham (2018) shows that in most African countries, women are more likely than men to be excluded from traditional financial services. According to the most recent survey results, women's economic exclusion appears to be a global phenomenon; it shows that men with access to a bank account through financial institutions outnumber women by about 200 million (Graham, 2018).

In line with this, most women in Lesotho and other African countries have turned to Mobile Money services for financial inclusion, as they carry lower transaction costs and have extended financial services, far beyond the reach of conventional banking.

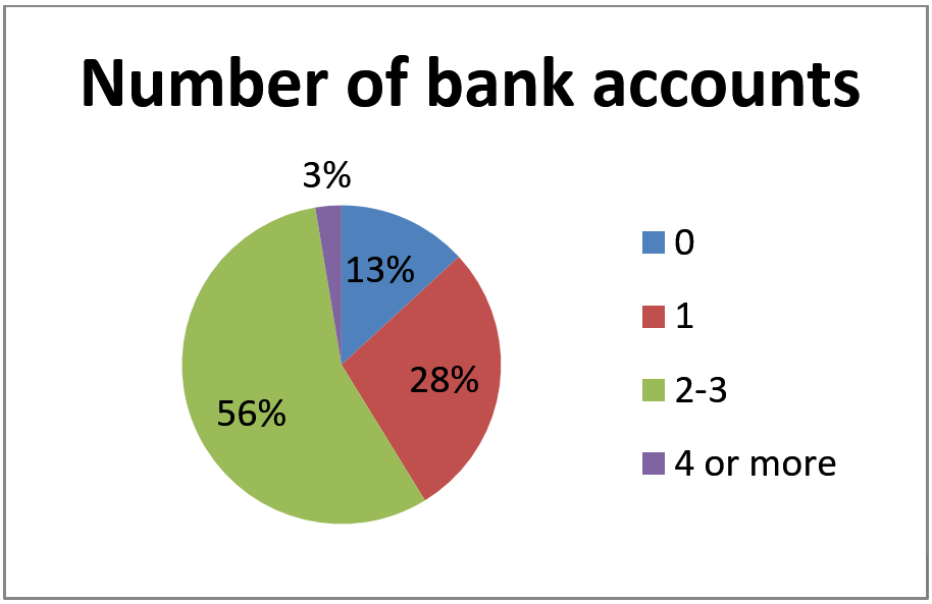


Figure 4.5: Number of bank accounts per participant

There are four leading banks in Lesotho, namely, Standard Lesotho Bank, Nedbank Lesotho, First National Bank of Lesotho and Post Bank Lesotho. However, people also bank internationally, and that also contributes to the number of bank accounts owned by a citizen.

Figure 4.5 displays the percentage measure of the number of bank accounts held by each individual in the sample, and shows whether they are located in an urban or rural area.

Table 4.3: Number of bank accounts vs. place of residence

Number of bank accounts	Location/ Area				Total	
	Urban		Rural		Frequency	In %
	Frequency	In %	Frequency	In %		
0	3	4.48%	12	25.53%	15	13%
1	13	19.40%	19	40.43%	32	28%
2-3	48	71.64%	16	34.04%	64	56%
4 or more	3	4.48%	0	0%	3	3%
Total	**67**	**100%**	**47**	**100%**	**114**	**100%**

Table 4.3 reveals that only 3% of the sampled population has four or more bank accounts, 13% do not own a bank account, 28% of the participants only have one bank account, and a significant 56% confirmed having 2 to 3 bank accounts.

The table illustrates the number of bank accounts held by each individual against the area or location they live in (urban or rural). It reveals that people living in urban areas encompass the largest group (71.64%), and that they hold 2 to 3 bank accounts each. The outcome is due to the fact that people living in urban areas have more access and availability to banks and ATMs, and some of these people even bank internationally.

The second largest group is 40.43% of people living in rural areas who hold one bank account each. The Finmark Trust (2016) report reveals that people living in rural areas cite lack of money, lack of understanding about how banks operate, and the remoteness of bank branches as their primary reasons for not having a bank account.

The table also shows that 25.53% of the participants living in rural areas do not have a bank account, and 4.48% of people living in urban areas share the same sentiment. Lastly, 3% of the respondents from the urban areas hold four or more bank accounts. Overall, the table shows that a total of 67 (58.77%) of the participants living in urban areas have a bank account, and 47 (41.23%) of the participants living in rural areas have a bank account. Given that people living in rural areas constitute the most substantial proportion of population in the country, one might expect the total opposite from the results, but due to the lack of banking infrastructure in rural areas, such an outcome is not surprising.

Chi-square test

The Chi-square test was used to determine if the participants' place of residence has any effect amongst the variables, that is, to see if it influences the number of accounts they hold. The level of statistical significance for the Chi-square test is 5%, respectively. The null hypothesis is rejected if the p-value is less than 0.05 or, as in this case, the null hypothesis is rejected if the t-statistic is higher than the critical value.

Microsoft Excel was used to calculate the t-statistic, and the Chi-square distribution table was used for the evaluation of the critical value.

After determining both values, the results showed that the t-statistic was higher than the critical value. In this case, the null hypothesis is rejected and concludes that there is a statistically significant place of residence difference, which implies that an individual's place of residence does affect how many bank accounts they own. This result proves that people living in rural areas indeed hold fewer bank accounts than those living in urban areas, as suggested in Table 4.3. (See Appendix C for the Chi-square evaluation.)

T-statistic > critical value → 22.7154>0.3519

For this Chi-square test, the hypothesis states:

H_0: There is no place of residence difference.

H_1: There is a place of residence difference.

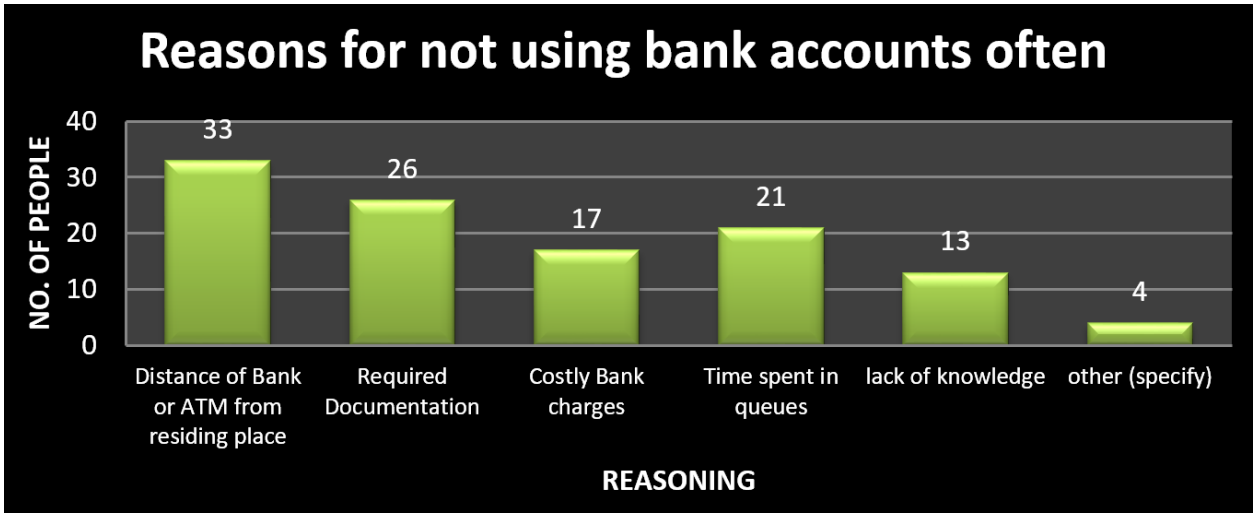


Figure 4.6: Reasons for not often using bank accounts

In addition to the ownership or non-ownership of bank accounts, certain factors influence people to use Mobile Money instead of banks. Participants were requested to choose any of the reasons listed for not using bank accounts frequently or which may increase preference in using Mobile Money instead.

Figure 4.6 illustrates that a total of 33 participants chose the distance of ATMs and banks from the place of residence as the top reason for not using the conventional way of banking. Twenty-six participants selected the requirement of documents as another significant challenge to opening bank accounts. Seventeen of the people complained about the costly bank charges. Twenty-one participants complained about the long time they have to spend in queues. Thirteen individuals showed that a lack of knowledge about the banking system makes them apprehensive of using bank accounts. Four individuals mentioned other reasons which included unsatisfactory customer service.

All these reasons prove that concerns within the banking system play a huge role in influencing the preference of Mobile Money services over the conventional way of banking.

4.5 CHALLENGES RELATED TO MOBILE MONEY USE

This section presents the results of the data analysis related to the various challenges faced by Mobile Money users. It covers the problems people encounter when using Mobile Money and with Mobile Money agents. It will also go through concerns that may prevent people from using Mobile Money. In addition, it looks at the distance people have to travel to get to agents, and the general views people may have concerning Mobile Money services.

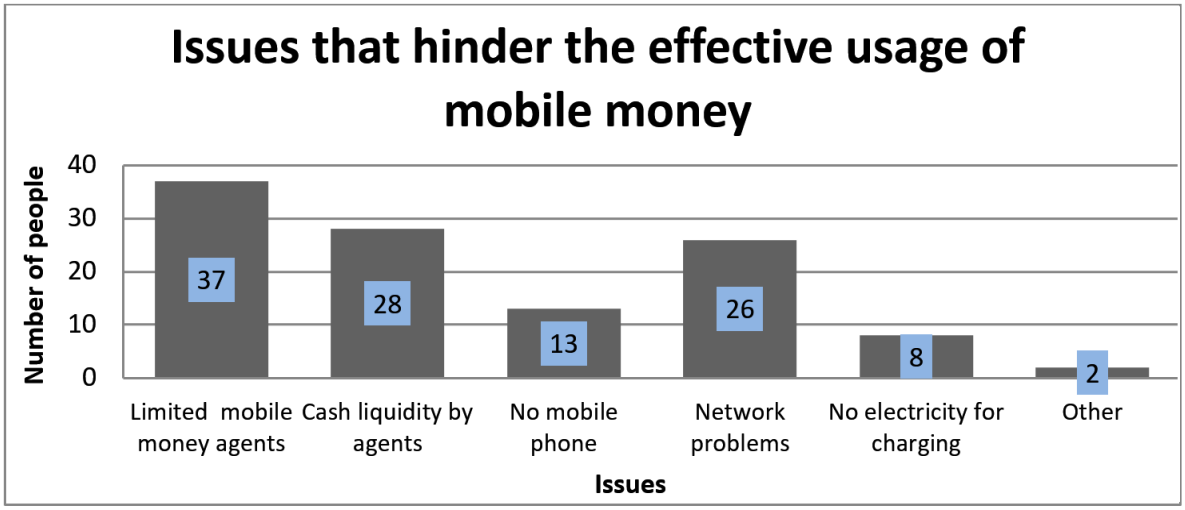


Figure 4.7: Issues that hinder the efficient usage of Mobile Money

Figure 4.7 above demonstrates all the issues participants selected as reasons for the ineffective use of Mobile Money. Of the participants, 37 indicated that the limited availability of Mobile Money agents is their biggest issue, while 28 participants confirmed that shortages of cash from the agents become a real problem in terms of withdrawals. Furthermore, 26 participants reported that network problems are a real issue when it comes to using Mobile Money, while 13 participants indicated that they do not have mobile phones, and lack of electricity was reported by 8 respondents. Two people mentioned other reasons, like the incompetence of some agents.

Table 4.4 presents the results of the analysis with regards to the issues that hinder the efficient usage of Mobile Money vs. place of residence.

Table 4.4: Issues that hinder the efficient usage of Mobile Money vs. place of residence

Challenges	Place of residence				Total	
	Urban		Rural		Frequency	In %
	Frequency	In %	Frequency	In %		
Limited agents	19	36.54%	18	29.03%	37	32.46%
Cash shortages	21	40.38%	7	11.29%	28	24.56%
No mobile phone	3	5.77%	10	16.13%	13	11.40%
Network problems	5	9.62%	21	33.87%	26	22.81%
No electricity	2	3.85%	6	9.68%	8	7.02%
Other	2	3.85%	0	0	2	1.75%
Total	**52**	**100%**	**62**	**100%**	**114**	**100%**

Mobile Money is fully functional with the help of agents, so if agents lag, then the whole system can fall through. Table 4.4 shows that 40.38% of people living in urban areas and 11.29% of people living in rural areas are dissatisfied with the cash liquidity from agents. Agents often have a shortage of cash, and this hinders the progress of the service. The second highest concern is the limited number of agents in the areas where the participants reside; this was accounted for by 36.54% of urban people and 29.03% of the rural population.

Another obvious challenge is the one of the network problems, mostly in rural areas. Of the respondents, 33.87% from the rural population showed that they have network problems, while only 9.62% in urban areas complained about the same issue. A few individuals, mostly in rural areas, had difficulties with electricity, not having a mobile phone and other problems.

The top obstacles are the problems with the Mobile Money agents and the network coverage in rural areas. Studies show that most financial services providers choose not to focus on the low income and rural communities because of their modest financial needs and low profit margins (Burchart & Hills, 1998a).

As Table 4.4 shows, most people living in rural areas experience problems with electricity, network coverage, mobile phones and limited agents, whereas people living in urban areas mostly complain about the scarcity of agents and shortage of cash. The observation shows a disparity in the challenges influenced by the location of the individual.

Studies also show that, despite all the benefits brought about by the development of Mobile Money for financially excluded rural communities, users of Mobile Money are intimidated by the complexity of Mobile Money technology, especially when they have to conduct transactions without assistance using their mobile phones (Chopra & Wright, 2012).

Chi-square test

The Chi-square test was used to determine whether an individual's location influences the effective use of Mobile Money. The results showed that the t-statistic was higher than the critical value. In this case, the null hypothesis was rejected, and it was concluded that there is a statistically significant effect on the use of Mobile Money dependant on the respondent's place of residence. This result proves that people living in rural areas encounter different Mobile Money problems to those living in urban areas, as suggested by Table 4.4 above. (See Appendix C for the Chi-square evaluation.)

T-statistic > critical value → 23.9495>1.1455

For this Chi-square test, the hypothesis states:

H_0: There is no place of residence difference.

H_1: There is a place of residence difference.

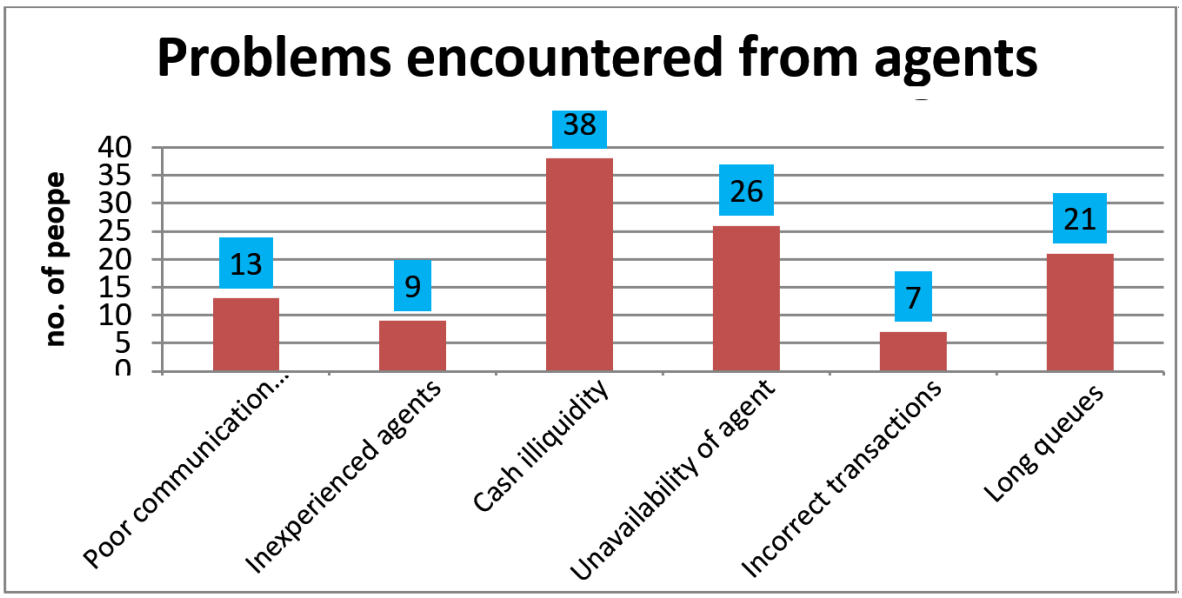


Figure 4.8: Challenges encountered with Mobile Money agents

Figure 4.8 illustrates the challenges that Mobile Money users encounter with Mobile Money agents. Cash liquidity (agents having a shortage of cash) was accounted for by a total of 38 respondents. The non-availability of agents was indicated by 26 respondents, while 21 respondents had concerns about long queues at the Mobile Money stations. Furthermore, 13 respondents complained about the poor communication skills of agents, 9 respondents were dissatisfied with inexperienced agents, and 7 complained that transactions were completed incorrectly.

Table 4.5 presents the results of the analysis with regards to the problems that users encounter from Mobile Money agents vs. age.

Table 4.5: Problems users encounter from Mobile Money agents vs. age

Problems encountered	Age							Total
	14-20	21-30	31-40	41-50	51-60	61-70	71-75	
Poor communication	2	3	-	5	1	2	-	13
Inexperienced agents	3	2	-	2	2	-	-	9
Shortage of cash	-	9	8	12	6	3	-	38
Unavailability of agents	1	3	10	9	2	1	-	26
Incorrect transactions	-	2	-	2	3	-	-	7
Long queues	-	-	2	5	-	1	3	21
Total	**6**	**20**	**25**	**39**	**14**	**7**	**3**	**114**

Table 4.5 reveals that older people in the age groups 41-50 and 71-75 comprise the largest group to complain about long queues. Individuals aged 41-50 constitute the largest group to have concerns about the shortage of cash followed by ages 21-30 and then 31-40. All these groups comprise of working people. Individuals aged 31-40 show concerns on the availability of agents, followed by those aged 41-50. Studies show that Mobile Money use varies by type of activity and with age. They show that individuals between the ages of 14-20 prefer to use their smartphones to make purchases online or download apps than to send or receive funds.

Therefore, as shown by the table, a few respondents indicated that they had hardly any problems with Mobile Money, other than inexperienced agents, poor communication, and unavailability of agents (PEW, 2O16). Elderly users, aged 71-75, who are less informed about the benefits of Mobile Money, mostly use mobile services to receive or to send funds. They therefore, mostly complained about the long queues they come across at mobile outlets. Contrary to this, Individuals between the ages of 21-60 use the money for almost everything; deposits, withdrawals, paying accounts, savings, buying airtime, paying school fees, and other

expenses. Studies show that these age groups are most concerned about a loss of funds, incorrect transactions, shortage of cash, and unavailability of agents, as indicated in Table 4.5 (PEW, 2016).

Chi-square test

The Chi-square test was used to determine if age affected the variables, that is, if age influences the kind of Mobile Money problems that users encounter. The level of statistical significance for the Chi-square test is 5%. The results showed that the t-statistic was higher than the critical value. In this case, the null hypothesis was rejected, and it was concluded that there is a statistically significant age difference, meaning that age does affect the kind of Mobile Money problems users encounter. This result proves that different age groups encounter different Mobile Money problems, as Table 4.5 above suggests. (See Appendix C for the Chi-square evaluation.)

T-statistic > critical value → 64.015 > 18.4962

For this Chi-square test, the hypothesis states:

H_0: There is no age difference.

H_1: there is an age difference.

4.6 MOBILE MONEY BENEFITS

This section presents the data analysis of the gains realised by Mobile Money users. It addresses what people regularly use funds on Mobile Money for, how effective they find Mobile Money services, strategies that can help promote Mobile Money services, and the evaluation of familiarity with Mobile Money services.

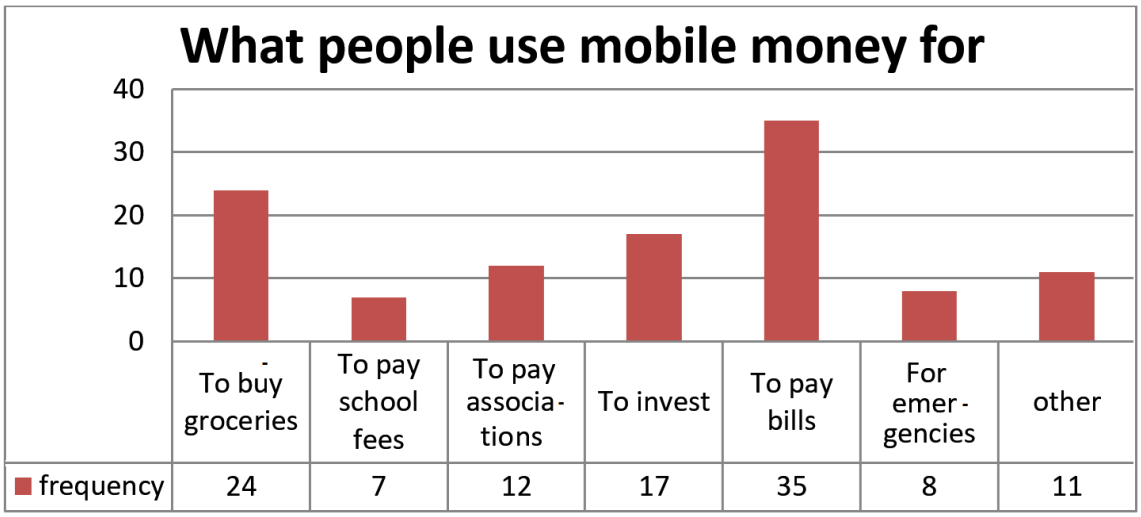


Figure 4.9: What funds on Mobile Money are used for

Figure 4.9 indicates that the highest number of respondents (35) use Mobile Money funds to pay household accounts, such as electricity, water and DStv. This group is followed by those who use funds to buy groceries (24). Seventeen of the participants indicate they use it for investment purposes (savings), while 12 respondents use the money to pay associations and stokvels, and 8 respondents use the funds for emergency purposes. Seven respondents revealed that they use it to pay children's school fees. The 11 participants who chose 'other' indicate that they use it mostly for purchasing airtime and making transfers to their loved ones.

Table 4.6 presents the results of the analysis with regards what people use Mobile Money funds for vs. gender.

Table 4.6: What people use funds for vs. gender

Uses of funds	Gender		Total
	Female	Male	
Buying groceries	18	6	24
Paying school fees	4	3	7
Paying associations	9	3	12
For investment/savings	4	13	17
Paying accounts	16	19	35
For emergencies	5	3	8
Other	3	8	11
Total	**59**	**55**	**114**

Table 4.6 reveals that most female participants use the funds on Mobile Money to buy groceries (18), pay associations (9), and pay accounts (16). A few of the female participants, however, use the funds for school fees (4), for investing/saving (4), for emergencies (5) while some use it for other purposes, like purchasing airtime. The table also demonstrates that most male participants use their Mobile Money funds for paying accounts (19), for investing/saving (13), and for other purposes, such as purchasing airtime (8). A few male participants use these funds for; buying groceries (6), Paying school fees (3), paying associations (3), and emergencies (3).

Some studies, such as that of Scharwatt and Minischetti (2014), state that interviews with Mobile Money agents show that in many markets, women are more likely to receive Mobile Money than send it, and the senders tend to be mostly men who work far from home. The women then use the funds received to settle accounts, buy groceries, and pay school fees, pay associations, and deal with household emergencies. The studies confirm, what the table above presents, that females mostly use their funds to pay accounts, buy groceries, and pay associations as compared to males.

Chi-square test

The Chi-square test was used to determine if there is any gender difference or effect amongst the variables, which is whether gender influences how individuals use their Mobile Money funds. The level of statistical significance for the Chi-square test is 5%, respectively.

The results showed that the t-statistic was higher than the critical value. In this case, the null hypothesis was rejected, and it was concluded that there is indeed a statistically significant gender difference, meaning that gender does affect how users use their Mobile Money. This result proves that females use their funds differently from males, and Table 4.6 shows precisely that. (See Appendix C for the Chi-square evaluation.)

T-statistic > critical value → 16.8178>1.6353

For this Chi-square test, the hypothesis states:

H_0: There is no gender difference.

H_1: There is a gender difference.

Figure 4.10 graphically illustrates the results that show how effective the respondents find Mobile Money services.

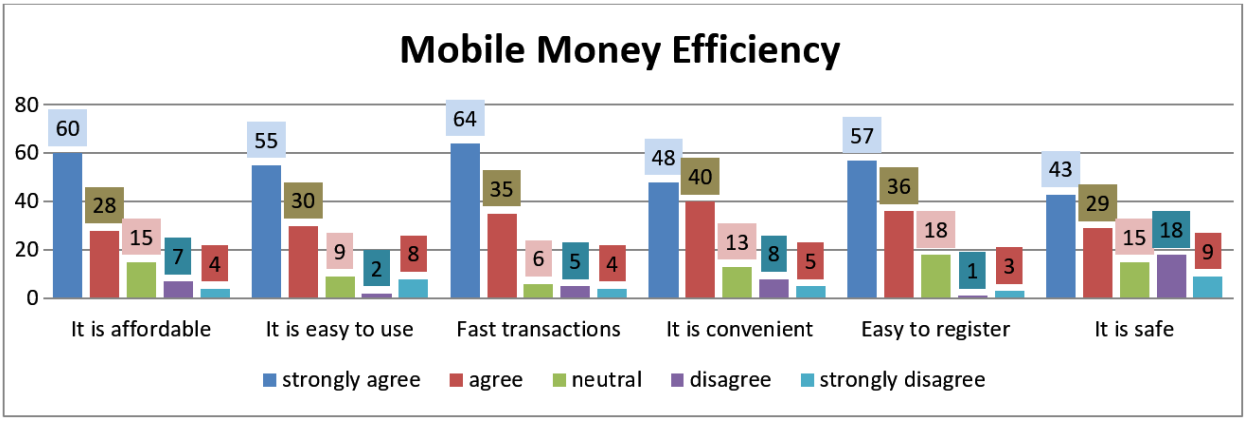


Figure 4.10: How effective people find mobile money services

Figure 4.10 shows that most Mobile Money consumers are in complete agreement with all the advantages of Mobile Money services, and only a few strongly disagree with the benefits. The results indicate that Mobile Money services have changed people's lives and thus have brought about a positive impact on financial inclusion in the country. The benefit that obtained the highest rating is that of fast transactions (64 participants), followed by affordability (60), and then the ease of registering (57), the simplicity of use (55) comes next, then convenience (48), and lastly, safety (43). Overall, looking at the bar chart, most participants seem to be satisfied with Mobile Money services.

The responses from the participants make it quite apparent that both males (55) and females (59), in particular working-class age groups, use Mobile Money equally. The bulk of the participants were from rural areas (62) and in the age group 41-50. Findings from this study and other studies generally confirm that the most significant obstacles Mobile Money users' face is the issue of cash liquidity as well as the limited number of agents in most areas.

Concerning the use of Mobile Money funds, most participants indicated that they use the funds for buying groceries and paying household accounts. In general, several participants understood the efficacy of Mobile Money and agreed with all of its benefits.

4.7 DESCRIPTIVE STATISTICS

The data captured in Table 4.7 below for the period July 2013 to July 2019 is accessible from the Central Bank of Lesotho (CBL). The decision to use the sample period from July 2013 was because the compilation for detailed Mobile Money data only began in 2013.

Table 4.7: Descriptive statistics

	Mean	Median	Std Dev	Skewness	Kurtosis	P(J-B)	Observations
No. of ATMs	13.41	13.43	1.735	0.277	2.641	0.337	66
No. of branches	3.828	3.849	0.112	0.324	2.870	0.247	66
Total credit	0.471	0.425	0.094	0.341	3.419	0.464	66
Total deposit	3.666	3.612	0.325	0.410	2.613	0.141	66
Airtime purchases	85.19	82.11	52.25	0.077	2.780	0.236	66
Money transfer	776.97	762.71	657.62	0.307	2.520	0.195	66
Mobile withdrawals	849.50	727.78	686.68	0.385	2.820	0.564	66
Mobile outlets	232.25	248.62	73.76	0.386	3.011	0.392	66
Mobile deposits	1104.9	1022.5	838.09	0.344	2.943	0.212	66
Mobile agents	0.048	0.037	0.027	0.349	2.781	0.509	66

Descriptive stats for the dependent variables (Financial Inclusion) and the independent variables (Mobile Money), for the period July 2013 to July 2019. P (J-B) = p-values of the Jarque-Bera statistic, StdDev = Standard Deviation.

The table presents the descriptive statistics of the variables' comprehensive data from July 2013 to July 2019. As the chart indicates, there were 66 observations for each variable, with StdDev being the standard deviations and P (J-B) representing the p-values of the Jarque-Bera statistic.

A Normally Distributed series has a skewness of zero, a kurtosis of three, and the P (J-B) must be higher than 0.05 so that we fail to reject the null hypothesis of the normal distribution. In this case, looking at the stats of all variables, the values for skewness are all close to zero. For the kurtosis, all values are very close to 3 or round up to 3. And all the Jarque-Bera p-values are larger than 0.05 which means we fail to reject the null hypothesis of the normal distribution for all variables. This outcome serves as confirmation that the data is normally distributed.

The standard deviation, the mean, and median differ from one variable to another. The standard deviation measures the spread of the data from the mean. The table shows that five of the variables have high standard deviations, which implies that their data is spread out over a broad range of values. In contrast, the other five have rather low standard deviations, which suggests that the data points tend to be close to the mean.

The Breusch-Godfrey Serial Correlation LM test demonstrated in Figure 4.11 below proves that there is no autocorrelation present. Furthermore, looking at the probability, with a Chi-Square (0.7318), the study fails to reject the null hypothesis, and hence, concludes that the series contains no autocorrelation.

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.272250	Prob. F(2,57)	0.7626
Obs*R-squared	0.624509	Prob. Chi-Square(2)	0.7318

Figure 4.11: The Breusch-Godfrey Serial Correlation LM test

4.7.1 Unit root test results

In time series analysis, the study of unit root properties is to measure the order of integration of variables and also to check for stationarity. It is essential to make sure that the series is stationary because regressing non-stationary series yields spurious regressions. Table 4.9 below presents the Unit Root test results. The findings show that all variables included in the analysis are integrated of order zero, that is, I(0) except for the log of number of ATMs, log of total credit, log of total deposit, log of commercial bank branches, and log of the number of Mobile Money agents per 100 000 adults, which are I(1). There was, therefore, a discovery of a case of a mixed order of integration; I(0) and I(1) of the variables.

Because of the mixed order of integration, the study uses the autoregressive distributed lag bounds testing (ADRL), which accommodates both orders of integration and does not require differencing of such series in the estimation.

For the unit root test, the hypothesis states:

H_0: The series has a Unit root / non-stationary series.

H_1: The series does not have a Unit root / stationary series.

The decision criterion for the Unit Root test: Rejection is at 1%, 5%, and 10% levels of significance, respectively. The values in parentheses are probability values, and the numbers outside indicate the t-statistic estimated from both the ADF test and the PP test.

Table 4.8: Results from ADF and PP unit root analysis

Variables	Variables at (level)		Variables at (first difference)		Order of Integration
	ADF statistics	PP statistics	ADF statistic	PP statistic	
latm	-1.6045(0.4746)	-1.6069 (0.4733)	-8.1589 (0.0000)	-8.1621 (0.0000)	I(1)
lbb	-1.3861 (0.5838)	-1.3860 (0.5838)	-7.9457 (0.0000)	-7.9457 (0.0000)	I(1)
ltc	-1.6386 (0.4574)	-1.6980 (0.4275)	-7.8753 (0.0000)	-7.8753 (0.0000)	I(1)
ltd	-0.6612 (0.8486)	-0.4838 (0.8871)	-8.5123 (0.0000)	-8.9654 (0.0000)	I(1)
lcd	-4.9437 (0.0001)	-3.5813 (0.0089)			I(0)
lcw	-4.9416 (0.0001)	-4.5789 (0.0004)			I(0)
ldmt	-4.6692 (0.0003)	-5.7799 (0.0000)			I(0)
lmo	-3.003 (0.0399)	-3.3260 (0.0176)			I(0)
lrc	-5.5287 (0.0000)	-5.8087 (0.0000)			I(0)
lma	-2.5457 (0.1097)	-2.5456 (0.1097)	-10.1380(0.0000)	-10.0526 (0.0000)	I(1)
lap	-3.6403(0.0075)	-5.1508 (0.0001)			I(0)

The variables; latm = log of the number of ATMs per 100 000 adults, lbb = log of the number of bank branches per 100 000 adults, ltc =log of total credit per 100 000 adults, ltd= log of total deposit per 100, 000 adults, lcd =log of mobile money customer deposits per 100 000 adults, lcw = log of mobile money customer withdrawals per 100 000 adults, ldmt = log of domestic money transfers per 100 000 adults, lmo = log of mobile money outlets per 100 000 adults, lrc = log of registered mobile money customers per 100 000 adults, lma = log of mobile money agents per 100 000 adults, lap= log of airtime purchases per 100 000 adults. In the parentheses are p-values of reported statistics.

4.8 REGRESSION RESULTS: FINANCIAL INCLUSION AND MOBILE MONEY

4.8.1 The long-run relationship-co-integration findings

The research makes use of the ARDL bounds test to establish whether a long-run relationship exists amongst the variables of interest.

The hypothesis for ARDL bounds testing states:

H_0: There is no evidence of co-integration.

H_1: There is evidence of co-integration.

The decision criterion for the bounds test: Rejection is at 1%, 5, %, and 10% levels of significance, respectively. The null hypothesis is rejected if the F-statistic is higher than the critical value for the upper bound I(1), then it can be concluded that there is co-integration. Such an outcome suggests that there is a long-run relationship amongst the selected variables. If, however, the F-statistic is lower than the critical value for the lower bound I(0), then we fail to reject the null hypothesis and conclude that there is no co-integration, hence, no long-run relationship exists amongst the selected variables. If the F-statistic falls between the lower bound I(0) and the upper bound I(1), the test is considered inconclusive.

Table 4.10 summarises the findings of the ARDL test for financial inclusion and Mobile Money. The results of all four estimates where financial inclusion was a dependent variable, with Mobile Money as an independent variable, show that that the estimated F-statistic is higher than the critical upper bound values at 1%, 5% or 10% significance levels. Thus, the null hypothesis is rejected for all four estimates, leading to the conclusion that there is indeed proof of co-integration linking Mobile Money and financial inclusion in the country. Therefore, the presence of a long-run relationship exists. The nature of a long-run relationship effectively means that the determinants of Mobile Money impact long-run financial inclusion in Lesotho.

Table 4.9: Test for co-integration—ARDL Bounds Testing

Explanatory variables: *lma, lap, lcd, lcw, ldmt, lrc, lmo*	F- statistic	Dependent variable: log of total credit per 100 000 adults (*ltc*)
		Critical value bounds of the F-statistic
		99% 95% 90%
		I(0) I(1) I(0) I(1) I(0) I(1)
Result: Reject null Co-integration evident at all significance levels	11.202	2.27 3.9 2.17 3.21 1.92 2.89
Explanatory variables: *lma, lap, lcd, lcw, ldmt, lrc, lmo*		Dependent variable: log of total deposit per 100 000 adults (*ltd*)
		Critical value bounds of the F-statistic
		99% 95% 90%
		I(0) I(1) I(0) I(1) I(0) I(1)
Result: Reject null Co-integration evident at 10% level of significance	3.30	2.73 3.9 2.17 3.21 1.92 2.89
Explanatory variables: *lma, lap, lcd, lcw, ldmt, lrc, lmo*		Dependent variable: log of bank branches per 100 000 adults (*lbb*)
		Critical value bounds of the F-statistic
		99% 95% 90%
		I(0) I(1) I(0) I(1) I(0) I(1)
Result: Reject null	4.39	2.73 3.9 2.17 3.21 1.92 2.89

Co-integration evident at all significance levels		
		Dependent variable: log of ATMs per 100 000 adults (*latms*)
		Critical value bounds of the F-statistic
		99% 95% 90%
		I(0) I(1) I(0) I(1) I(0) I(1)
Result: Reject null Co-integration evident at all significance levels	3.80	2.73 3.9 2.17 3.21 1.92 2.89

The variables: lcd =log of mobile money customer deposits per 100 000 adults, lcw = log of mobile money customer withdrawals per 100 000 adults, ldmt = log of domestic money transfers per 100 000 adults, lmo = log of mobile money outlets per 100 000 adults, lrc = log of registered mobile money customers per 100 000 adults, lma = log of mobile money agents per 100 000 adults, lap= log of airtime purchases per 100 000 adults. Values in parentheses are the probability values of reported statistics.

4.8.2 The long-run results

The levels of statistical significance for the Granger causality tests are 1%, 5%, and 10%, respectively. (See Appendices F and G for the representation of the results of the long-run estimates.) The long-run coefficients show that they are not only positive, but also statistically significant in all models at 1%, 5% and 10%, and therefore, satisfy priori expectations. Consequently, the results show that all the explanatory variables reflecting Mobile Money, in the long run, affect financial inclusion in Lesotho.

A rise in the number of people registered for Mobile Money services, for example, means an increase in the number of people financially included in the country. An increase in airtime purchases can increase the total credit. This finding is consistent with the existing empirical literature. Sekantsi and Motelle (2016), for instance, have found in their analysis of financial inclusion in Lesotho, that an improvement in the balance of trust accounts, increases the funds available for the banking system.

4.8.3 The short-run relationship

The tables also present the short-run relationship between Mobile Money and financial inclusion. The results show that mobile financial services, even in the short run, impact financial inclusion in Lesotho. Similar to the long-run coefficients, the short-run coefficients of the explanatory variables are also all positive and statistically significant at a 1%, 5% and 10% level of significance in all the error-correction models.

This finding also shows that, apart from Mobile Money affecting financial inclusion, in the long run, it also has a significant impact on the dynamics of short-run financial inclusion. The short-run results also indicate that the lagged error-correction term coefficient is negative and statistically significant at a 1%, 5% and 10% level of significance.

The discovery indicates that, on average, 11% to 89% of the financial inclusion gap is dissipated before the next cycle in the current month following the previous month's shock. On the other hand, the negative sign of the coefficient of the lagged error-correction term and the fact that it is statistically significant indicates that the series is non-explosive (John, 2018). The research methodology proves to be valid, and hence, the long-run equilibrium is without a doubt, achievable. This outcome, therefore, is consistent with the connection of co-integration among the variables involved in each model.

4.8.4 Diagnostic test results

The tables above also represent the results for the estimation of the error-correction model (ECM). Having established that there is a long-run relationship between financial inclusion and Mobile Money, the tables present the short-run results together with their associated diagnostic test results. Diagnostic tests with the estimated ECMs had to be conducted to ensure the reliability and accuracy of the parameters involved.

The result shows that all evaluated ECMs meet all criteria for condition tests. For instance, the JB test shows that the residuals are Normally Distributed; the Serial Correlation LM test shows no presence of serial correlation, the White’s test confirms no presence of heteroscedasticity, and lastly, Ramsey's RESET test for model stability indicates that the models are stable over the sampling period. All these tests confirm that the estimated models will most likely give accurate results.

4.8.5 Granger causality between financial inclusion and Mobile Money

Co-integration of Mobile Money and financial inclusion, as has already been said, may mean that Granger causality will occur in at least one direction but does not imply the direction of temporal causality between variables.

This study uses the estimated error correction model to assess the short- and long-run Granger causality between financial inclusion and Mobile Money. Based on the evaluated error correction models presented in Appendices F and G, the coefficients of all the first differences of independent variables in each model show positive signs and are also statistically significant at 1%, 5% or 10% of the significance level.

These results demonstrate evidence of Granger's short-run causality from Mobile Money to financial inclusion. Accordingly, the negative and statistically significant coefficient of the lagged error correction term indicates Granger’s long-run causality from Mobile Money to financial inclusion. The findings generally suggest that Mobile Money Granger causes financial inclusion in the short run and the long run.

CHAPTER 5:
POLICY RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

The study's main objective was to determine the success (or lack thereof) of Mobile Money growth in increasing the level of financial inclusion in Lesotho. Mobile Money is increasingly becoming part of the Basotho's daily lives. Most of the answers emphasizing the use of the service throughout the month reinforce this observation. A large amount of funds is transacted across the network, suggesting that the people of Lesotho use the service for bulky and small financial activities. How funds were utilised was also critical in assessing the overall effectiveness of the system. In addition to account payments, a significant section of Mobile Money users also used it to purchase groceries, which is part of the Basotho's daily lives.

5.2 FINDINGS

The greatest Mobile Money challenge that was discovered was mostly related to the Mobile Money system, particularly the Mobile Money agents. According to the literature, the most significant obstacle was the unavailability of cash withdrawals. Money liquidity is a challenge in many developing countries when it comes to Mobile Money services.

Throughout this study, it has been clear that the development and usage of mobile financial services have grown significantly throughout the years in most African countries. It has been a success, given the usage rate of mobile phones even in under-developed economies, where most people find themselves excluded financially. The development of mobile services has significantly included the vast populations who were previously unbanked or under-banked because of several reasons mentioned in the study, such as: inaccessible formal financial services, limited banking infrastructures, lack of knowledge and information with regards to financial services, illiteracy, to mention a few.

Empirical evidence has, however, shown that the development of mobile financial services has improved many lives of the unbanked population, and increased financial intermediation in terms of issues like credit growth and investments to entrepreneurs. Mobile financial services have also improved economic growth in many developing countries, including Lesotho.

This research used the ARDL bounds testing method for co-integration and the ECM-based Granger causality test to assess the effect of Mobile Money growth on financial inclusion as well as determining the causality path between these two variables using monthly data from July 2013 to July 2019. The assessed positive and statistically significant coefficients imply reliable proof of a long-run relationship between Lesotho's financial inclusion and Mobile Money. The findings also reveal that Mobile Money Granger causes financial inclusion at both the short- and the long-run.

5.3 RECOMMENDATIONS

This study underscores the significance of mobile telephone networks, and thus, Mobile Money in the growth of financial services in the country. These services have been able to reduce the many challenges posed by a restricted banking infrastructure by allowing the unbanked and under-banked community access to financial services. This form of development also serves as a milestone for low-income individuals who can now have trust accounts with Mobile Money services, which will ultimately assist them to open formal bank accounts with the country's banking sector.

It is, therefore, essential for policy-makers in Lesotho to realise how great the impact of mobile financial services have been in the country since its initial set up. Policy-makers should encourage and promote engagement and innovation in the implementation of mobile phone technology and its associated financial services. Financial inclusion policies should also aim to remove obstacles for Mobile Money services to enable the creation of a more financially stable

community. The legal and regulatory system should be friendly and accommodating in this respect to allow for more progress in Mobile Money and other electronic financial services. This initiative would make a dramatic contribution to commercial development, and thus lead to more rapid economic growth.

Mobile network operators should set up initiatives to develop the use of Mobile Money in the country's remote regions. This form of growth could be accomplished through increased consumer awareness, enhanced network coverage and expanded agent networks in rural areas. This may be achieved through negotiations with small business owners who are willing and able to operate as agents in rural areas, and as such, serve as deposit and withdrawal points.

More specifically, MNOs must seek to make greater use of Mobile Money as an electronic means to encourage and facilitate simple transactions, even for uneducated persons. This kind of initiative would help alleviate the various liquidity problems that Mobile Money agents face. Finally, MNOs should strive to create more partnerships with all the commercial banks in Lesotho and other financial institutions, to facilitate financial intermediation from mobile financial services to the banking system. Such an undertaking would help promote financial innovation; opening doors to financial services and hence, more exceptional financial support.

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APPENDICES

APPENDIX A:
ETHICAL CLEARANCE CERTIFICATE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

SCHOOL OF GRADUATE SCHOOL OF BUSINESS ADMINISTRATION ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE **PROTOCOL NUMBER: WBS/FI2280567/911**

PROJECT TITLE Does the development of mobile financial services have an impact on financial Inclusion in Lesotho? The case of M-Pesa and Eco-Cash

INVESTIGATOR	Ms Mantai Jonathan
SCHOOL/DEPARTMENT OF INVESTIGATOR	MM (Finance and Investment)
DATE CONSIDERED	6 March 2020
DECISION OF THE COMMITTEE	Approved unconditionally
RISK LEVEL	MINIMAL RISK
EXPIRY DATE	28 FEBRUARY 2021

ISSUE DATE OF CERTIFICATE 2 April 2020 **CHAIRPERSON** _____
(Dr MDJ Matshabaphala)

cc: Supervisor: Professor Kodongo

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am are authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

_____ _____/_____/_____
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

APPENDIX B:
QUESTIONNAIRE

Section A: Biographic information

- What is your age?
- What is your gender?
- Where do you live?

Section B: Mobile Money Usage

- Which one of the two mobile money services do you use?
- Approximately how many mobile money transactions do you make in a month? (i.e., Airtime purchases, account payments, deposits, withdrawals)
- If any, how many local bank accounts do you have?
- Tick any of the following reasons for not using a bank account regularly

Section C: Mobile Money challenges

- Indicate the challenges that prevent you from using mobile money effectively
- Indicate which one of the views you feel is true about mobile money
- What difficulties do you encounter with mobile money agents?
- What do people you know give as reasons for not using mobile money?
- What is the approximate distance to your nearest mobile money agent?
- What operational problems do you encounter when using mobile money?

Section D: Mobile Money benefits

- Please indicate your rating for mobile money services
- Rate your understanding of the following
- What users usually use mobile money funds for
- What strategies do you believe can help promote mobile money services in your area
- Would you recommend mobile money services to friends or family?

Section E: Mobile Money trends

- During what time of the month do you usually use mobile money?
- How do you prefer to transact using mobile money?
- How long have you been using mobile money?
- What type of mobile phone do you use to carry out mobile money transactions?
- Which mobile money transactions do you frequently make?
- On average, how much money do you withdraw/deposit monthly through mobile money

APPENDIX C:
CHI-SQUARE TESTS

Age vs. problems encountered

Observed (O) DATA	**AGE GROUP**							
PROBLEMS	**0-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-75**	**total**
Poor communication	2	3	0	5	1	2	0	13
Inexperienced agents	3	2	0	2	2	0	0	9
Shortage of cash	0	9	8	12	6	3	0	38
Unavailability of agents	1	3	10	9	2	1	0	26
Incorrect transactions	0	2	0	2	3	0	0	7
Long queues	0	0	2	5	0	1	3	21
Total	6	20	25	39	14	7	3	114
Expected (E) DATA								
	0-20	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-75**	**total**
Poor communication	0,6842	2,2807	2,8509	4,4474	1,5965	0,7982	0,3421	13
Inexperienced agents	0,4736	1,5789	1,9737	3,0789	1,1053	0,5526	0,2368	9
Shortage of cash	2	6,6666	8,3333	13	4,6667	2,3333	1	38
Unavailability of agents	1,3684	4,5614	5,7018	8,8947	3,193	1,5965	0,6842	26
Incorrect transactions	0,3684	1,2280	1,5351	2,3947	0,8596	0,4298	0,1842	7
Long queues	1,1052	3,6842	4,6053	7,1842	2,5789	1,2895	0,5526	21
Total	6	20	25	39	14	7	3	114
(O-E)^2/E								
	0-20	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-75**	**total**
Poor communication	2,5303	0,2268	2,8509	0,0687	0,2229	1,8092	0,3421	13
Inexperienced agents	13,4736	0,1122	1,9737	0,3781	0,7243	0,5526	0,2368	9
Shortage of cash	2	0,8166	0,0133	0,0769	0,381	0,1905	1	38
Unavailability of agents	0,0991	0,5344	3,2402	0,0012	0,4457	0,2229	0,6842	26
Incorrect transactions	0,3684	0,4852	1,5351	0,0651	5,329	0,4298	0,1842	7
Long queues	1,1052	3,6842	1,4738	0,6641	2,5789	0,065	10,838	21
Total	6	20	25	39	14	7	3	114
t statistic	**Sum of all the (O-E)^2/2) calculated values**				**64.0153**			
t critical	**Obtained from the X^2 distribution table**				**18.4926**			

degrees of freedom	**(No. of category-1) x (No. of category-1), e.g. (7-1)^*(6-1)**	**30**			
level of statistical significance	**5% or 0.05**				

Location vs. Issues hindering the effective use of mobile money

Observed (O) DATA	**Location**		
Hindering Issues	**Urban**	**Rural**	**Total**
Limited agents	19	18	37
Cash shortages	21	7	28
No mobile phone	3	10	13
Network problems	5	21	26
No electricity	2	6	8
Other	2	0	2
Total	52	62	114
Expected (E) DATA			
	Urban	Rural	Total
Limited agents	16,8771	20,1228	37
Cash shortages	12,7719	15,2280	28
No mobile phone	5,9298	7,0701	13
Network problems	11,8596	14,1403	26
No electricity	3,6491	4,3508	8
Other	0,9122	1,0877	2
Total	52	62	114
(O-E)^2/E			
	Urban	Rural	Total
Limited agents	0,2670	0,2239	37
Cash shortages	5,3007	4,4458	28
No mobile phone	1,4475	1,2140	13
Network problems	3,9676	3,3276	26
No electricity	0,7452	0,6250	8
Other	1,2968	1,0877	2
Total	52	62	114

t statistic	**23,9495**	**Sum of all the (O-E)^2/2) calculated values**	
t critical	**1.145476**	**Obtained from the X^2 distribution table**	
degrees of freedom	**5**	**(No. of category-1) x (No. of category-1), e.g. (7-1)^*(6-1)**	
level of statistical significance	**0.05**		

Gender vs. Purpose for which funds are used

Observed (O) DATA	**Gender**		
Use of funds	**Female**	**Male**	**Total**
Buying groceries	18	6	24
Paying school fees	4	3	7
Paying associations	9	3	12
For investment/savings	4	13	17
Paying bills	16	19	35
For emergencies	5	3	8
Other	3	8	11
Total	59	55	114
Expected (E) DATA			
	Female	Male	Total
Buying groceries	12,4210	11,5789	24
Paying school fees	3,6228	3,3771	7
Paying associations	6,2105	5,7894	12
For investment/savings	8,7982	8,2017	17
Paying bills	18,1140	16,8859	35
For emergencies	4,1403	3,8596	8
Other	5,6929	5,3070	11
Total	59	55	114
(O-E)^2/E			
	Female	Male	Total
Buying groceries	2,5057	2,6880	24
Paying school fees	0,0392	0,0421	7
Paying associations	1,2528	1,3440	12
For investment/savings	2,616	2,8071	17
Paying bills	0,2467	0,2646	35
For emergencies	0,1784	0,1914	8

Other	1,2738	1,3665	11
Total	59	55	114
t statistic	**16,81779**	**Sum of all the (O-E)^2/2) calculated values**	
t critical	**1.63539**	**Obtained from the X^2 distribution table**	
degrees of freedom	**6**	**(No. of category-1) x (No. of category-1), e.g. (7-1)^*(6-1)**	
level of statistical significance	**0.05**		

Place of Residence vs. Number of bank accounts

Observed (O) DATA			
Number of bank accounts	**Urban**	**Rural**	**Total**
0	3	12	15
1	13	19	32
03-Feb	48	16	64
4 or more	3	0	3
Total	67	47	114
Expected (E) Data			
	Urban	**Rural**	**Total**
0	8,8157895	6,184211	15
1	18,807018	13,19298	32
03-Feb	37,614035	26,38596	64
4 or more	1,7631579	1,236842	3
Total	67	47	114
(O-E)^2/E			
	Urban	**Rural**	**Total**
0	3,836685	5,469317	15
1	1,793025	2,556014	32
03-Feb	2,8677664	4,088093	64
4 or more	0,8676355	1,236842	3
Total	67	47	114

t statistic	**22,715378**		
t critical	**0.351846**		
degrees of freedom	**3**		
level of statistical significance	**0.05**		

APPENDIX D:
NUMBER OF ATMS MODEL

Horizon	Explanatory variables	Dependent variables: log of no. of ATMs
Short-run	**ECM (-1)**	**-0.5720 -0.7120 - 0.1927 -0.1408 -0.3145 -0.1810 -0.1911**
		(0.0129) (0.0063) (0.0118) (0.0126) (0.0104) (0.0034) (0.0065)
	d(lap)	0.0289
	d(lma)	(0.0116)
	d(lcd)	0.0142
	d(lcw)	(0.0412)
	d(ldmt)	-0.0123
	l(lrc)	(0.0195)
	d(lmo	0.0349
		(0.0259)
	c	-0.02803
		(0.0300)
		-0.0775
		(0.0798)
		-0.0199
		(0.0543)
		0.0760 0.0336 0.0785 0.0534 0.0742 0.0140 0.0221
		(0.0275) (0.0134) (0.0252) (0.0252) (0.0221) (0.0074) (0.0138)
Long-run	**d(lap)**	0.0564
	d(lma)	(0.0002)
	d(lcd)	0.1701
	d(lcw)	(0.0001)
	d(ldmt)	0.0219
	l(lrc)	(0.0000)
	d(lmo)	0.0234
		(0.0000)
	c	0.0539
		(0.0005)
		0.0196
		(0.0000)
		0.0610
		(0.0002)
		39.9989
Diagnosis	**JB**	0.2307 0.3077 2.2083 0.4485 0.1345 0.1567 0.6256
	BG-LM test	(0.6656) (0.8243) (0.5754) (0.6590) (0.9345) (0.8867) (0.7654)
	RESET test	1.5630 5.6320 8.5422 0.7073 1.3456 2.4154 2.3390
	WHITE test	(0.4534) (0.1209) (0.3412) (0.5678) (0.6436) (0.3929) (0.2019)
		0.3722 0.3575 1.2320 0.5345 0.1426 1.0945 0.1597
		(0.6161) (0.6523) (0.2018) (0.1945) (0.4123) (0.4567) (0.8194)
		0.1101 0.0912 0.1089 1.1023 1.2456 2.3010 1.9191
		(0.1799) (0.2347) (0.4789) (0.6745) (0.8902) (0.7801) (0.5347)

The variables: lcd =log of mobile money customer deposits per 100 000 adults, lcw = log of mobile money customer withdrawals per 100 000 adults, ldmt = log of domestic money transfers per 100 000 adults, lmo = log of mobile money outlets per 100 000 adults, lrc = log of registered mobile money customers per 100 000 adults,

lma = log of mobile money agents per 100 000 adults, lap= log of airtime purchases per 100 000 adults. The values in parentheses are the probability values of reported statistics.

APPENDIX E:
TOTAL DEPOSITS MODEL

Horizon	Explanatory variables	Dependent variables: log of total deposits
Short-run	**ECM (-1)**	**-0.1424 -0.4086 -0.1711 -0.5547 -0.6033 -0.8082 -0.3190**
		(0.0297) (0.0139) (0.0252) (0.0257) (0.0230) (0.0077) (0.0152)
	d(lap)	
	d(lma)	0.0069
	d(lcd)	(0.0183)
	d(lcw)	0.0163
	d(ldmt)	(0.0296)
	l(lrc)	0.0135
	d(lmo	(0.0272)
		0.0027
	c	(0.0191)
		0.0063
		(0.0227)
		0.0143
		(0.0598)
		0.0112
		(0.0407)
		0.0072 0.0604 0.0173 0.0719 0.0757 0.0325 0.0195
		(0.0034) (0.0340) (0.0289) (0.0296) (0.0264) (0.0160) (0.0174)
Long-run	**d(lap)**	1.9082
	d(lma)	(0.0398)
	d(lcd)	1.3853
	d(lcw)	(0.0351)
	d(ldmt)	2.0788
	l(lrc)	(0.0089)
	d(lmo	3.1827
		(0.0734)
	c	5.5882
		(0.0614)
		0.0246
		(0.0536)
		1.0660
		(0.0814)
		26.7393
Diagnosis	**JB**	2.3114 1.2656 3.1224 1.7673 1.3346 1.2667 2.6774
	BG-LM test	(0.2017) (0.4380) (0.1145) (0.4778) (0.6904) (0.8345) (0.3901)
	RESET	4.7391 3.2132 1.2345 5.6340 1.7654 1.7564 5.6434
	WHITE test	(0.1623) (0.4123) (0.1566) (0.2344) (0.4355) (0.1123) (0.4234)
		1.2456 1.5411 2.3341 0.0066 0.1234 0.3467 0.1623
		(0.1425) (0.2345) (0.0956) (0.9456) (0.2645) (0.7564) (0.6673)
		3.0321 1.5300 2.6543 \1.2561 0.2567 0.3578 0.1023
		(0.1456) (0.3456) (0.6543) (0.4236) (0.7454) (0.5512) (0.8801)

The variables: lcd =log of mobile money customer deposits per 100 000 adults, lcw = log of mobile money customer withdrawals per 100 000 adults, ldmt = log of domestic money transfers per 100 000 adults, lmo = log of mobile money outlets per 100 000 adults, lrc = log of registered mobile money customers per 100 000 adults,

lma = log of mobile money agents per 100 000 adults, lap= log of airtime purchases per 100 000 adults. The values in parentheses are the probability values of reported statistics.

APPENDIX F:
TOTAL NUMBER OF BRANCHES MODEL

Horizon	Explanatory variables	Dependent variables: log of no. of branches
Short-run	**ECM (-1)**	**-0.1595 -0.2768 -0.7965 -0.2349 -0.8191 -0.3392 -0.8869**
		(0.0063) (0.0651) (0.0116) (0.0121) (0.0177) (0.0355) (0.0704)
	d(lap)	
	d(lma)	0.0053
	d(lcd)	(0.0080)
	d(lcw)	0.0056
	d(ldmt)	(0.0135)
	l(lrc)	0.0043
	d(lmo	(0.0091)
		0.0175
	c	(0.0085)
		0.0003
		(0.0106)
		0.0447
		(0.0275)
		0.0047
		(0.0142)
		0.0709 0.0339 0.0786 0.0538 0.0748 0.0138 0.2213
		(0.0126) (0.0133) (0.0250) (0.0267) (0.022) (0.0073) (0.0138)
Long-run relationship (cointegrating equation)	**d(lap)**	0.4789
	d(lma)	(0.0784)
	d(lcd)	0.4340
	d(lcw)	(0.0794)
	d(ldmt)	2.6556
	l(lrc)	(0.0189)
	d(lmo	0.5447
		(0.0157)
	c	1.2777
		(0.0130)
		0.0336
		(0.0206)
		0.0853
		(0.0179)
		44.7302
Diagnosis	**JB**	0.0345 0.0569 0.4578 0.2567 1.2674 0.0340 0.1325
	BG-LM test	(0.9945) (0.8956) (7546) (0.6745) (0.8745) (0.9914) (0.2345)
	RESET	0.00887 0.1742 1.2780 0.3456 0.3867 3.2560 1.2301
	WHITE test	(0.5634) (0.7045) (0.4567) (0.3456) (0.4578) (0.6890) (0.5314)
		0.0945 0.0237 0.1256 0.4456 0.3041 0.0967 1.2340
		(0.6645) (0.8876) (0.6789) (0.8956) (0.6756) (0.5678) (0.8656)
		0.0452 0.0234 0.3245 0.2034 0.1120 0.5421 0.01239
		(0.3345) (0.5678) (0.6630) (0.1276) (0.7890) (0.4580) (0.5378)

The variables: lcd =log of mobile money customer deposits per 100 000 adults, lcw = log of mobile money customer withdrawals per 100 000 adults, ldmt = log of domestic money transfers per 100 000 adults, lmo = log of mobile money outlets per 100 000 adults, lrc = log of registered mobile money customers per 100 000 adults, lma = log of mobile money agents per

100 000 adults, lap= log of airtime purchases per 100 000 adults. The values in parentheses are the probability values of reported statistics.

APPENDIX G:
TOTAL CREDIT MODEL

Horizon	Explanatory variables	Dependent variables: log of no. Total credit
Short-run	**ECM (-1)**	**-0.1552 -0.2067 - 0.1784 -0.4240 -0.1103 -0.4037 -0.6086**
		(0.0148) (0.0064) (0.0166) (0.0120) (0.0107) (0.0035) (0.0070)
	d(lap)	
	d(lma)	0.0092
	d(lcd)	(0.0840)
	d(lcw)	0.0757
	d(ldmt)	(0.0146)
	l(lrc)	0.0463
	d(lmo	(0.0463)
		0.0068
	c	(0.0913)
		0.0005
		(0.0113)
		0.4373
		(0.2935)
		0.0151
		(0.0250)
		0.0044 0.0074 0.0192 0.0292 0.0697 0.0669 0.0347
		(0.0160) (0.0084) (0.0167) (0.0154) (0.0255) (0.0286) (0.0354)
Long-run relationship (cointegrating equation)	**d(lap)**	4.3866
	d(lma)	(0.0832)
	d(lcd)	4.0199
	d(lcw)	(0.0791)
	d(ldmt)	2.4501
	l(lrc)	(0.0189)
	d(lmo	3.4502
		(0.0157)
	c	1.2917
		(0.0238)
		0.1171
		(0.0214)
		1.6470
		(0.0179)
		23.0225
Diagnosis	**JB test**	**0.1290 0.2389 0.3567 0.1945 0.4589 0.1456 1.3450**
	BG-LM test	**(0.8345) (0.8536) (0.7956) (0.7790) (0.8967) (0.9045) (0.9023)**
		0.4589 0.3589 1.2340 0.7501 0.8765 1.7842 1.7455
	RAMSEY's	(0.4690) (0.6456) (0.1721) (0.4678) (0.9056) (0.7101) (0.8811)
		0.5318 0.3256 0.2162 0.1123 0.7123 0.5538 0.1490
	WHITE test	(0.0156) (0.0745) (0.1567) (0.1003) (0.4553) (0.6754) (0.7689)
		1.2786 2.5640 8.7349 3.5782 0.9325 4.5902 2.8901
		(0.6453) (0.2101) (0.1905) (0.3567) (0.7504) (0.5534) (0.6734)

The variables: lcd =log of mobile money customer deposits per 100 000 adults, lcw = log of mobile money customer withdrawals per 100 000 adults, ldmt = log of domestic money transfers per 100 000 adults, lmo = log of mobile money outlets per 100 000 adults, lrc = log of registered mobile money customers per 100 000 adults, lma = log of mobile money agents per 100 000 adults, lap= log of airtime purchases per 100 000 adults. The values in parentheses are the probability values of reported statistics.

APPENDIX H:
DECLARATION OF PROFESSIONAL EDIT



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Independent Skills Development Facilitator

Dear Ms Jonathan

This letter is to record that I have completed a language edit of your master's dissertation entitled, "Does the development of Mobile financial services have an impact on Financial Inclusion in Lesotho? The case of M-Pesa and Eco-cash".

The edit that I carried out included the following:

-Spelling
-Grammar
-Vocabulary
-Punctuation
-Pronoun matches
-Word usage
-Sentence structure
-Correct acronyms (matching your supplied list)
-Captions and labels for figures and tables
-Spot checking of 10 references

The edit that I carried out excluded the following:

-Content
-Correctness or truth of information (unless obvious)
-Correctness/spelling of specific technical terms and words (unless obvious)
-Correctness/spelling of unfamiliar names and proper nouns (unless obvious)
-Correctness of specific formulae or symbols, or illustrations.

Yours sincerely



Retha Burger

10 November 2020