

**Digital Financial Inclusion:
Determinants of M-Shwari in Kenya**

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Joan Jesang Kiptorus

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Supervisor: Abdul Latif Alhassan, Ph.D.

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ABSTRACT

Kenya has experienced unprecedented levels of growth in terms of mobile phone penetration and technological advancement, which is boosting financial sector development and subsequently spurring on economic growth. A report published by the Communications Authority of Kenya reported mobile phone penetration at 90.4%, with 41 million mobile phone subscribers as at December 2017. On the back of this, Kenya has made great strides in financial inclusion and with an overall score of 86%, received the top award for inclusive financial services from the Brookings Institution's 2017 Financial and Digital Inclusion Project. This was further reinforced by Financial Sector Deepening Kenya's findings that between 2006 and 2016, the number of fully excluded adults fell from 40% of the population to 17% of the population. One of the technological advancements that is helping bridge the financial inclusion gap is M-Shwari, a mobile banking product launched in Kenya in November 2012, through a collaborative effort between Safaricom and Commercial Bank of Africa. M-Shwari is available to M-Pesa customers and allows users to save and borrow from their mobile phones while earning interest on money saved.

This study examined the determinants of M-Shwari usage for deposits and accessing loans. The study was conducted in the Kibera slum in Nairobi County in Kenya and used structured questionnaires to collect data over a six-month period (June 2017–December 2017). The target population was 250 000 persons, with an ultimate sample of 146 individuals. The study employed the Ordinary Least Squares regression technique to examine the drivers of financial inclusion, defined as the number of loans and deposits taken over the past six months on the M-Shwari platform, given respondents' gender, age, education, income, employment and number of dependants. Linear regressions were used to analyse the data. The logistic model was also employed to examine the likelihood of depositing with M-Shwari.

The analysis reveals that women have a greater likelihood of using the M-Shwari service, which may indicate that mobile-based interventions could help bridge the gender gap in financial inclusion. While it was found that those who are employed have an increased likelihood of utilisation of the deposit M-Shwari feature, the assessment of determinants of M-Shwari deposits indicate that those who are employed are less likely to deposit money in M-Shwari. This may be due to the plethora of options at their disposal that offer superior benefits over and above those offered by M-Shwari. Education was also a significant determinant and the study found that those with higher levels of education were more likely

to use the deposit feature of M-Shwari, but less likely to use the loan feature. The implication of this could be that those who were better educated were in a better position to weigh the pros and cons of loans from M-Shwari versus other sources. While an increase in income increased overall use of the M-Shwari service, a number of dependants linked to pressures on income meant that individuals with a higher number of dependants were less likely to deposit money with the M-Shwari service but more likely to borrow from the service to supplement their income.

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ACRONYMS AND EXPLANATION OF TERMS

CA	Communications Authority of Kenya
CBA	Commercial Bank of Africa
CBR	Central Bank Rate
Chama	An informal cooperative society that is normally used to pool and invest savings by people in East Africa, and particularly Kenya.
CRB	Credit Reference Bureau
FSD	Financial Sector Deepening
GDP	Gross domestic profit
ICT	Information and communication technology
IFC	International Finance Corporation
KCB M-Pesa	A mobile-based account exclusively offered to M-PESA customers.
Ksh	Kenyan shillings
MFI	Monetary financial institution
MNO	Mobile network operator
M-Pesa	A mobile phone-based money transfer, financing and microfinancing service, launched in 2007 by Vodafone for Safaricom and Vodacom, the largest mobile network operators in Kenya and Tanzania.
M-Shwari	M-Shwari is the revolutionary new banking product for M-PESA customers that allows you to save and borrow money through your phone while earning you interest on money saved.
OLS	Ordinary least squares
SACCO	Savings and credit cooperative organisation
SADC	Southern African Development Community
SME	Small and medium-sized enterprise
SPSS	Statistical Package for Social Sciences
SSA	sub-Saharan Africa

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Over the past decade, a number of revolutionary mobile money innovations have been brought to market by Safaricom and other mobile network operators (MNOs) in Kenya to meet the demand for products that build on the concept of mobile money transfer. Among the innovations that have been rolled out are M-Pesa, a mobile phone e-wallet and remittance service, that allows sending and receiving of money, M-Kopa, a green energy innovation anchored on solar energy as an alternative source of lighting, particularly in the rural areas, and M-Shwari, a savings and loan product geared toward M-Pesa users. This study seeks to expound on the M-Shwari innovation. M-Shwari, a collaborative effort between Safaricom, Kenya's largest MNO, and Commercial Bank of Africa (CBA), is a revolutionary mobile money product launched in Kenya in November 2012. It was launched on the back of Safaricom's mobile money service, M-Pesa, which has been a global phenomenon. M-Pesa is utilized by 66% of Kenyan adults, i.e. over 25 million persons, processes approximately \$20 million in daily transactions, and is facilitated by nearly 80,000 agents (Cook, & Mckay, 2015).

Subscribers of M-Shwari sign up for a savings account that earns interest, hosted by CBA, but accessed using the M-Pesa menu on the subscriber's phone. Eligibility for an M-Shwari account is an M-Pesa account (which requires a registered Safaricom line), and acceptable identification such as a local Kenyan identity card or local/foreign passport. Once active, the M-Shwari account gives customers access to deposits, withdrawals, savings and credit. In a nutshell, it enables users to move money between their M-Pesa and M-Shwari accounts, earn interest on deposits, and have access to loans. Customers can earn up to 5% on savings while loans attract a flat facilitation fee of 7.5%. Loan eligibility and subsequent limits are based on customers' savings activity on M-Shwari, their use of M-Pesa and use of Safaricom's voice and data (Mirzoyants-McKnight, & Attfield, 2015)

M-Shwari has received worldwide recognition and it is anticipated to drive financial inclusion in Kenya significantly. Firstly, it allows customers to save from as little as \$0.01 equivalent and still earn 2% interest on this, and secondly, it provides customers access to loans to help them deter and overcome financial shocks. M-Shwari is proof that financial products can be delivered through leveraging and scaling mobile network infrastructure

Mirzoyants-McKnight, & Attfield, 2015). This savings and loan product, encompassing deposits, withdrawals, savings and credit, delivered solely through mobile infrastructure, is helping tap into the demographic of low-income earners and previously unbanked Kenyans. It is also the first product to use telecommunication data to make credit-scoring decisions.

The success of M-Shwari has been in its ability to allow low-income Kenyans to balance the need for short-term liquidity, while providing a future return. Customers can save in the short term, while increasing future access to credit. The product is simple and highly engaging. However, the speedy and virtual nature comes with customer education and disclosure challenges. M-Shwari has introduced a universe of financial opportunities in terms of savings and loans for a vast majority of the population who previously had no access to formal financial services (Cook, & Mckay, 2015).

1.2 Financial Inclusion and Accessibility

Financial inclusion is broadly defined as the provision of financial products and services, in a transparent and affordable manner, to the sections of population that are disadvantaged and marginalised (Mahendra, 2006). The definitions and quantification of financial inclusion has, however, evolved from a cookie cutter classification of individuals and enterprises as either included or not, to a more dynamic definition pegged on three main dimensions, i.e. access, usage and quality. This is depicted in Table 1 below. A financial system that is inclusive contributes to poverty reduction, improvement of economic development and provides a possibility to bridge wide inequality gaps.

Table 1. Dimensions for measurement of financial inclusions

ACCESS	Availability of formal, regulated financial services; Physical proximity, Affordability
USAGE	Actual usage of financial services and products; Regularity, Frequency, Duration of time used
QUALITY	Products are well tailored to client needs. Appropriate segmentation to develop products for all income levels.”

Adapted from “Defining and measuring financial inclusion: Financial inclusion in Africa”, by Alliance for Financial Inclusion (AFI), (2011)

This broader definition allows for a more complete understanding of financial inclusion away from the flawed assumption that inclusion is simply a function of accessibility. It

encompasses frequency of use of these products, whether the products are meeting clients' needs and whether clients' livelihoods are improved as a result.

To build an equitable society through sustainable and inclusive growth, financial inclusion needs to be given due consideration. A study carried out in 2009 by the World Bank Group entitled 'The Economic Impact of Banking the Unbanked' found that a 1% increase in financial inclusion facilitated an increase in annual gross domestic product (GDP) per capita of 0.03% (Bruhn, & Love, 2009). In line with other such studies and findings, there is consensus by global and national level policy makers on the importance of financial inclusion as a key priority for development. International Finance Corporation (IFC), the arm of the World Bank Group that promotes development through private sector engagement, is a strong proponent for financial inclusion. One of its key goals is commitment to the provision of a broad range of financial services to small and medium-sized enterprises (SMEs). IFC also spearheaded the G20 Global Financial Inclusion Agenda that aims to promote inclusive financial services, including payments, services, remittance and insurance. By 2013, more than 50 national-level policy making and regulatory bodies had publicly committed to financial inclusion strategies for their countries (IOS Press, 2012).

The former Central Bank of Kenya Governor, Prof. Ndung'u Njuguna's 2010 address entitled 'Future of Financial Service Delivery in Kenya' notes financial inclusion as a pillar in Vision 2030, Kenya's blue print to be a middle-income nation by 2030 (Ndungu, 2010). Approximately 80% of adults in sub-Saharan Africa do not have access to financial services (Consultative Group to Assist the Poor [CGAP], 2011). Giving the poor access to finance allows them to safely engage in broader economic activities through enhanced savings and investment cycles (Njuguna, 2014). Low-income levels among the population and vicious cycles of poverty evident in Africa call for progressive innovations in monetary systems and technological models to provide solutions to matters of wealth distribution and financial deepening.

1.3 Mobile Financial Services and Financial Inclusion

Mobile phone penetration in sub-Saharan Africa (SSA) in 2015 was estimated at 80%. Five years prior, this figure was barely above 50%. By 2021, mobile penetration is expected to peak at 100%, on the back of increased urbanization as well as budding investments in rural network coverage by MNOs (Islam, & Kabir, 2015). Africa is now considered a front-runner in information and communication technology (ICT) growth.

On the other hand, the penetration of financial services on the continent is dismally low. Few households enjoy formal financial services with only 20% owning bank accounts. Comparative to emerging economies standing at an average of 63.5% deposit institution penetration rate, SSA stands at an average of only 16.6%. This confluence of high mobile penetration and low access to financial services has created a unique niche for the development of mobile financial services on the continent (Ondiege, 2010). The population in rural areas, which accounts for about 60% of Africa's total population, has been isolated from the traditional commercial banking networks. This is due to physical and geographical challenges and the high costs associated with expanding 'brick and mortar' branch networks into these areas. This demographic is not particularly profitable due to low deposit and transaction amounts.

Mobile banking is helping bridge this infrastructure gap and presents immense opportunities in Africa to increase fair, transparent and cost-effective means to bring on board sections of the population that were previously disadvantaged and marginalised. By leveraging on the existing extensive networks of MNOs to break down geographical constraints, mobile technology has become a powerful way to deliver financial services to billions all over the world. It has allowed for reconfiguration of the economics of service delivery by increasing speed, security, efficiency and reducing the cost of financial transactions. As a tool for development, it will help boost domestic savings and increase remittances from the diaspora. Additionally, it will ease financial burdens and reduce business costs, which will benefit SMEs and boost overall private sector development. Mobile phones are evolving beyond just a tool for communication to the disadvantaged and marginalised populations of Africa, they are transforming people's handsets into banks in their pockets.

1.4 Problem Statement

The rate of financial inclusion in Kenya has steadily grown since the emergence of pioneer mobile money service, M-Pesa, in 2007. This has been supplemented by the number of persons registering with microfinance institutions, which experienced a steady rise at the same time (FSD, 2016). In addition to the rapid uptake by the demography, these internal innovations and development of the mobile transfer application have seen financial institutions also adopt the service for monetary transactions. This has led to an increase in mobility of finances and improved efficiency in transactions, thus reducing the prior cost implications in the sector.

The impact of mobile money services on increasing financial access, both formal and informal, is undeniable. Studies conducted locally indicate increased financial inclusion and impact on the lower income demographics' livelihood through mobile financial services, including mobile banking, M-Pesa and M-Shwari, amongst others. The adoption of M-Shwari has been gradually progressive, standing at 21 million users as of 2017 and approximately US\$300 million disbursed over five years since the product's inception (Safaricom, 2017). Research and literature on this particular innovation is, however, scant and not readily available. The impact of M-Shwari on the population has not been extensively researched due to the infancy of the product, having only been operational for the past five years.

Financial inclusion remains a pertinent topic on development agenda of emerging economies. Gaining an understanding of the factors that affect inclusion and enhance it remains critical to streamline and fine tune products and solutions to ensure these have maximum impact wherever they are deployed. M-Shwari is one such solution that has been deployed in Kenya. Gaining an understanding of how the product is used and its determinants within the broader agenda of financial inclusion, poses a relevant research problem. Therefore, this research seeks to expound on the determinants of financial inclusion, using the M-Shwari product as a proxy for financial inclusion.

1.5 Objectives of the Study

The study examined the determinants of M-Shwari usage for deposits and accessing loans. The population focus of the study was low-income earners who would typically be excluded from formal financial services.

1.6 Research Question

The research addressed the following research question:

- i) What are the determinants of M-Shwari usage for deposits and accessing loans?

1.7 Scope of the study

The study was conducted in the Kibera slum in Nairobi County in Kenya over a period of six months (June 2017–December 2017) covering a target population of 250,000 persons and sample of 146 persons.

1.8 Value of the Study

The outcome of this study will be beneficial to the Government of Kenya, service providers, telecommunication firms and key stakeholders in credit management. It will offer insight into income flow, credit levels and default in the Kenyan population. This is essential in managing the money supply in the economy. In addition, scholars and researchers may find the outcomes outlined in this document useful for future reference and as a foundation for further research.

The study will also provide support to policy makers who regulate telecommunication, mobile innovations and monetary management in Kenya and assist in the formulation of relevant policy frameworks.

Owing to the growth and rapid evolution experienced in this area of digital financial innovation, regulators need to understand the sector and new technology involved and any risks inherent. They can then begin to instigate the necessary regulatory framework, legislations and policy to nurture the industry and protect both consumers and relevant industry players. Finally, the study's outcome will be crucial in harnessing strategies to ensure the unbanked have increasing access to finance.

1.9 Limitation of the Study

The study was limited to one study area, Kibera, in Nairobi County, which is the largest slum in the country and therefore would offer a good sample of the lower income earners in the population. It would have been even more insightful to expand the study into other areas of the country covering low-income earners, including the rural areas, to get a more representative sample. However, due to time and resource constraints, this was not possible.

1.10 Organization of the Study

The next chapter of the study, Chapter Two, introduces the basic concepts behind financial inclusion. The study begins by defining key concepts and giving an overview of mobile money and financial inclusion within the Kenyan context. Thereafter, theories in the literature underpinning financial inclusion are introduced. On a macro level, the focus was on the financial intermediation theory, the modern growth theory and the endogenous growth theory. Drilling down to the consumer and micro level, the study looks at the basics of demand and supply and the consumer choice theory. Chapter Two concludes with relevant empirical studies linked to mobile money/banking and financial inclusion.

Chapter Three on methodology provides information pertaining to the research design, the data used in the analysis, the motivation for choosing this data and the methods employed to achieve the objectives. For purposes of this study, a descriptive survey design is used. Structured questionnaires, which comprise both open-ended and closed-ended questions to collect primary data, are employed. Data collected is analysed through descriptive and inferential statistics. To examine the data further, the Statistical Package for Social Sciences (SPSS) is used to code and analyse data collected via the questionnaires to run a regression analysis.

Chapter Four contains the results of the analysis in graphs, tables and regression data. This data is analysed and ultimately the summary, conclusions and recommendations are given in Chapter Five.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focuses on discussing the available research relevant to the area of study. The stage is set by defining key concepts underpinning financial inclusion. Thereafter, an overview on the evolution of the concept of mobile money in Kenyan context is given and how this has impacted on financial inclusion in the country. Penultimately, a theoretical framework is provided for financial inclusion and finally relevant empirical literature is reviewed, pertaining to the impact of mobile money on financial inclusion.

2.2 Definition of Concepts

The tenets of financial inclusion date back to the early 19th century, linked to the rise of co-operatives in India in 1904. These initially addressed extortion of the poor by non-institutional moneylenders, who loaned money at punitive interest rates, resulting in peasants defaulting and losing property and money. The term financial inclusion was coined in the early 1990s, in relation to the closure of bank branches in developed countries, which had a knock-on effect on access to physical banking services (Leyshon, & Thrift, 1993). The concept of financial inclusion gained momentum on the realisation that there was a need to build a financially inclusive system that bridged the gap and facilitated banking services in both rural and urban areas. To address geographical exclusion and increase provision of basic banking services in rural areas, the Reserve Bank of India liberalized branch licensing norms that facilitated the opening of branches all over the country (Singh, & Roy, 2015). Dr. Muhammad Yunus, founder of Bangladesh's Grameen Bank, is lauded as the father of financial inclusion and brought the concept to the fore when he was awarded the 2006 Nobel peace prize for his work on bringing microfinance to the poor. Distress in advanced economies has increased vulnerability of the poor and brought the need for safety nets into even sharper focus. Financial inclusion has evolved significantly into a key determinant for financial development and economic growth, over and above being a solution to bridge the inequality gap and reduce poverty. In its simplest form, financial inclusion refers to the ability to access relevant products and services. More comprehensively, the Centre for Financial Inclusion defines it as, "A state in which all people who can use them, have access to a full suite of quality financial services, provided at affordable prices in a convenient manner, and with dignity for the clients" (Centre for Financial Inclusion, 2011). An inclusive

financial system smoothes the production and consumption of goods and services, which in turn drives income growth through increasing productive capacity of the society at large. Financial inclusion has taken centre stage on the development agenda and governments of emerging economies have made it a priority through establishment of disruptive funding vehicles and enforcement of conducive policies and regulatory reforms.

For this study, and within the context of M-Shwari, financial access is defined as a product of usage of the service. Although access and usage rates of formal financial products and services are similar in some contexts, usage can be considered a definite subset of access (King, 2014). Access can be categorised as those who can use these products and services, inclusive of those who are voluntarily excluded (as a matter of personal preference). Therefore, in measurement of access, it is paramount to include those with sufficient purchasing power, those who meet all documentary requirements and those who have access to these good and services but opt out of using them.

2.3 Overview of Mobile Money and Financial Inclusion in Kenya

A significant number of Kenyans, approximately 80%, live below the poverty line (\$1.25 a day) and experience volatility in their income and consumption levels. In the absence of safety nets to safeguard against this volatility, poverty persists. On the other hand, since the 1990s, mobile phone penetration has increased rapidly in Kenya, tripling between 2006 and 2011, to 25 million subscribers and over 80% of households by 2011 (Suri, Jack, & Stoker, 2012). According to a report by the Communications Authority of Kenya (CA), penetration stood at 90.4%, with 41 million mobile phone subscribers as at December 2017 (Communication Authority of Kenya, 2017).

In 2007, Safaricom, Kenya's leading MNO, launched M-Pesa, a transformative mobile phone-based platform for money transfer. M-Pesa has undergone exponential growth since then and as of March 2018, a staggering 50% of Kenya's GDP, approximately \$37 billion, was transacted through M-Pesa. The appeal with M-Pesa is the range of services it offers. It includes e-wallet, remittances services and bill payments, in addition to access to platforms such as M-Shwari, which offer interest bearing deposits and credit, which are essential in the lives of everyday Kenyans. It helps streamline income and consumption through increased security and a reduction in transaction costs. This has, in turn, stimulated an increase in volume, value and diversity of transactions for its users. Financial Sector Deepening (FSD) Kenya in a 2016 survey found that households that did not use M-Pesa experienced 7%

reduction in per capita consumption when exposed to shocks, while those that did, remained unaffected (FSD, 2016). M-Pesa has changed the economic landscape in Kenya. Building on its success, Kenya's banking and telecom sectors have been completely transformed, now 20 million previously excluded Kenyans have access to financial services and thousands of small businesses have been created. It has been especially successful in reaching low-income Kenyans. The Consultative Group to Assist the Poor (CGAP) found that access and use of M-Pesa since its inception has lifted an astounding 2% of households out of poverty (CGAP, 2017).

M-Shwari has built upon the benefits of M-Pesa by deepening and diversifying the income and consumption streams of Kenyan adults through offering a platform to access credit and save. This savings and credit facility has allowed users to manage fluctuations in cashflow and better cope with unexpected shocks. As of December 2017, M-Shwari had disbursed \$2.3 billion in loans and received \$6.7 billion in deposits, providing services to over 21 million Kenyans (Safaricom, 2017). Data from CBA estimates that the platform receives approximately 300,000 loan applications a day, with between 70,000–100,000 of those loans disbursed. M-Shwari has provided a gateway to credit access for those marginalised from the loans market primarily due to lack of collateral and credit history. Putting this into perspective, only 700,000 people in Kenya had bank loans when M-Shwari was launched in 2012, with less than half that number having loans from microfinance institutions. M-Shwari has now given millions of poor Kenyans access to savings and credit services, that help them mitigate financial shocks, better manage risk, and given them a platform to help invest in improving their future.

2.4 Theoretical Framework

2.4.1 Financial Intermediation Theory

There is consensus as to the benefits of a robust and structured financial system on economic growth. The rationale is that in a well-functioning financial system, resources are allocated efficiently to areas and sectors where they will be most efficiently utilised. A robust financial system also boosts the rate of investment and aggregate savings, thus accelerating physical capital accumulation, while also fostering competition and stimulating innovation, which further drives economic development.

The theory of financial sector development in emerging economies, emphasised today, goes back to Schumpeter (1934) who stressed the role of the banking sector as a means to finance productive investments and subsequently spur on economic growth. Fama (1980) further built on this with the financial intermediation theory. He opines that, “When banking is competitive, these portfolio management activities, in principle, fall under the Modigliani-Miller theorem on the irrelevance of pure financing decisions. It follows that there is no need to control the deposit creation or security purchasing activities of banks to obtain a stable general equilibrium with respect to prices and real activity.” The reality is, however, contradictory and banks are not actively involved in the functionality of pure nominal commodities or units of account playing the role of numéraire in a monetary system. This theory guides the assessing of whether certain customers are better off as a result of products created by intermediaries through hedging in case these nominal commodities are not particularly suitable. King and Levine (1993) developed a finance growth theory on the premise that financial systems assess prospective business owners, mobilize funds towards the most productive activities, hedge against the risks associated with these innovative activities, and reveal the gains expected as a result of the innovation rather than from the production of existing products and services using tried and tested methods. Robust financial systems encourage successful innovation and thereby spur on economic development. Similarly, a breakdown of financial sector structure and distortions deter innovation that subsequently hinders economic growth. This theory guides the assessment of access to safe, fair, transparent and affordable finance as a pre-requisite to enable better integration of socially and economically excluded persons.

2.4.2 Modern Growth Theory

Merton (1977) put forth the modern growth theory, which studies the evolution of growth and relative income inequalities. It assesses financial sector development through the lens of provision of basic services to completely excluded individuals through innovative products. Financial development enables growth through its deployment of funds from inefficient to efficient uses. A better financial ecosystem allows intermediaries to better channel funds from savers to investors. They are also able to attract more savings and in doing so, avail more resources to go towards investments. A sophisticated financial sector enhances hedging, pooling and diversification of risk. This subsequently allows for the set up of substantial projects that may not have been previously possible. It enhances growth through creation of liquidity by short-term borrowing from savers and long-term lending to investors. This action

of linking savers and investors leads to a reduction in transaction and information costs. Financial development occurs when there is a reduction in these costs, which subsequently facilitates better provision of the following core financial functions:

- i) Producing *ex ante* information about possible investments and capital allocation;
- ii) Monitoring of investments and implementation of corporate governance;
- iii) Facilitate trading and diversification and management of risk;
- iv) Pooling and mobilisation of savings; and
- v) Trade: Exchange of goods and services.

Through their impact on savings and investments decisions, the above functions influence economic growth (Demirguc-kunt, & Levine, 2009).

Merton's modern growth theory alludes to three ways in which the financial sector and financial market imperfections can influence long-term growth through its impact on physical and human capital accumulation, impact on occupational choices and further through its ability to drive technological progress (De Gregorio, & Guidotti, 1995). For instance, in theories focused on capital accumulation, imperfect financial markets impede the ability of marginalised people to borrow to invest in education or physical capital. For theories stressing entrepreneurship, these markets curtail the ability of gifted but poor individuals to raise capital to engage in projects. These effects result from the intermediation role played by financial institutions in enabling the financial sector to mobilize savings for investments, foster and boost inflows of foreign capital and optimize capital allocation between competing projects, thus ensuring that it is deployed where it will be used most efficiently (Dauda, & Makinde, 2014).

Three views exist in the literature on the relationship between financial development and economic growth. The first view is the 'supply leading' view, which finds its theoretical underpinnings in the work of Schumpeter (1911) and later McKinnon (1973). It stipulates that with a focus on the services provided by financial intermediaries, financial development is a pre-requisite for economic growth. The implication of this is that the establishment of financial institutions encourages demand for financial services by entrepreneurs in the modern growth-inducing sectors. The theory emphasises the positive influence the development of the financial sector has on the per capita income growth rate of a country.

The premise is that services provided by this sector act as a catalyst that is essential for economic growth. The second, the ‘demand following’ view, stipulates that economic growth leads to financial development. With growth of real output and industrialization of agribusiness and other natural resource sectors, demand for financial services increases (Patrick, 1966). The third view contends that financial development and economic growth are co-dependent.

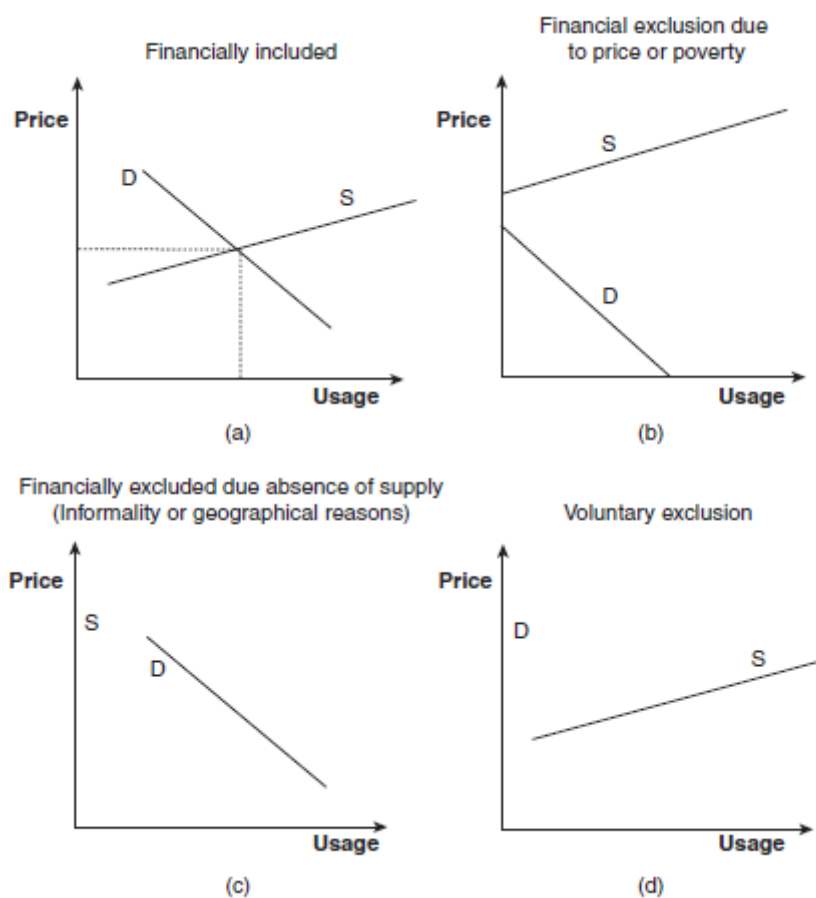
The endogenous growth theory through modelling the services provided by financial intermediaries such as risk allocation and liquidity provision, also asserts that financial intermediation positively influences steady-state economic growth. It further stipulates that government intervention, through measures such as interest-rate ceilings and direct credit programmes, has an adverse effect on financial sector development, which negatively affects economic growth. McKinnon (1973) and Shaw (1973) were the first to put forward the notion that when governments, in a bid to control fiscal resources, implement financially repressive policies, they restrict competition which subsequently discourages both saving and investment, as the rates of return are lower than what could have been obtained in a competitive market. Financial intermediaries are unable to function at full capacity, thereby inhibiting their ability to efficiently and optimally allocate resources, which is detrimental to the economy.

2.4.3 Demand, Supply and Consumer Choice Theory

The basics of demand and supply are defined and consumer theory is applied to questions of financial access to further provide a framework for financial inclusion. In building this framework, demand and supply is considered at the individual level, national level and consumer choice theory at the individual level to highlight constraints and dynamics of financial inclusion (King, 2014).

Figure 1 (a) below depicts financial inclusion using the traditional demand and supply framework where financial services usage is determined at the intersection of the demand and supply curves. The inference from this is that demand falls with the increase in the price of financial goods and services, while on the other hand, banks are better incentivised to supply these goods and services as prices increase. The intersection of these curves determines the usage of the financially included individual at a given price.

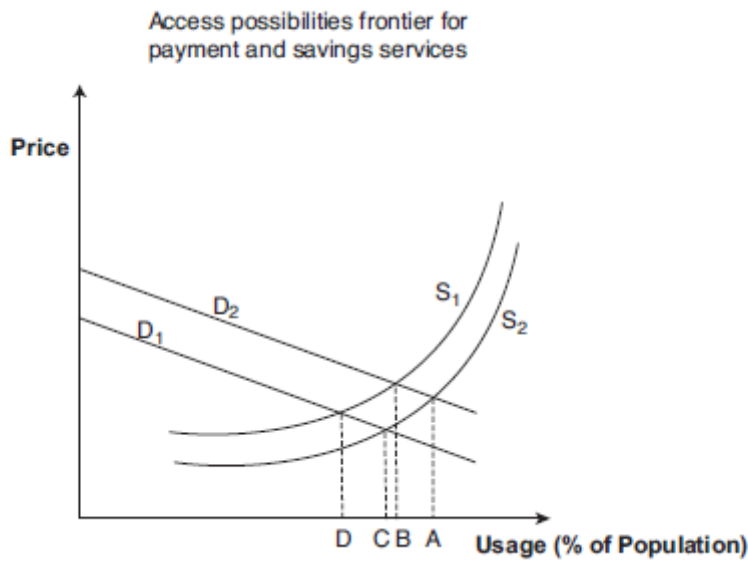
Figure 1. Demand and supply of financial services



Adapted from “Enabling globalization: A conceptual framework for financial inclusion and recent evidence for sub-Saharan Africa” by M. King (2014).

In Figure 2 below, the demand and supply framework at the country level makes a distinction between the banked population and an increase in access due to an outward shift in the aggregate demand curve and a downward shift in the aggregate supply curve. Beck and de la Torre (2005) defined an ‘Access Possibilities Frontier’, which represents the threshold of the population that can be served by financial institutions relative to a given set of state variables. The threshold of this frontier can be maximized through greater efficiencies in supply, achieved as a product of reduction in distortionary regulation policies, optimization of economies of scale and market contestability, which increases demand as those previously excluded become included.

Figure 2. Macro-level access possibilities frontier

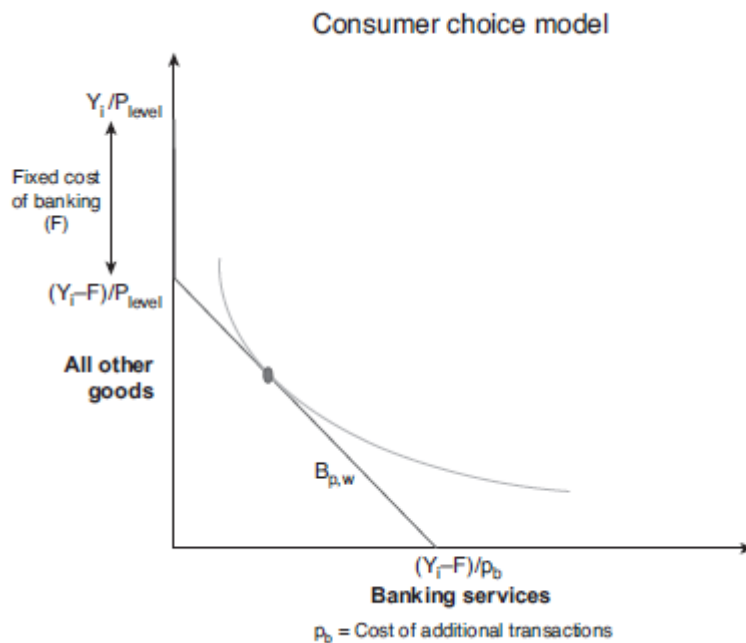


Adapted from “The basic analytics of access to financial services” by T. Beck & A.de la Torre (2005).

From a two-goods consumer choice theory perspective, financial services is modelled as one of the consumables in an individual’s basket of goods and services. If a fixed cost component related to this financial service is assumed, for example, a monthly tariff, a budget constraint is introduced. In Figure 3 below, this monthly tariff is represented by the length of the vertical segment of the budget constraint and represents the fixed cost of access to financial services.

There is a trade-off between financial services and other goods in the consumable basket in that the instance individuals purchase the minimum financial services, they forego other goods. In Figure 3 below, at point Y_i/P , individuals who are excluded will spend their income on other goods. Should an individual opt to spend the smallest possible amount on financial services, the tariff will have to be paid, which brings them to point $(Y_i - F)/P_{level}$. Although unlikely, point $(Y_i - F)/P_b$ represents the instance where an individual’s income is spent solely on financial services, with P_b representing the cost of each additional financial transaction.

Figure 3. Consumer’s budget constraint with fixed cost



Adapted from “Enabling globalization: A conceptual framework for financial inclusion and recent evidence for sub-Saharan Africa” by M. King (2014).

Taking into consideration demand and supply at the individual and national level, and consumer choice theory at the individual level, the constraints to financial inclusion are identified as follows:

- i) *Insufficient Income*: Lack of sufficient income can result in financial exclusion. This is illustrated in Figure 1 (b) where the demand curve fails to intercept the supply curve before it reaches the y-axis. An increase in incomes would push the supply curve upward and outward increase the likelihood of interception and subsequently financial inclusion.
- ii) *Voluntary Exclusion*: Due to personal preference, be it religious, ethnic or other reasons, despite the accessibility of financial services, certain individuals may opt out and this is represented by a vertical demand curve in Figure 1 (d). From an aggregate demand perspective, Beck and de la Torre (2005) opine that increased financial literacy can shift the aggregate demand curve for financial services higher for a given level and distribution of national income.
- iii) *Eligibility*: If the requirements for an individual to open a bank account or transact are too stringent this can result in financial exclusion. In the absence of perfect information

between financial institutions and their customers where strict Know-Your-Customer documentation is needed, informality prevents inclusion. This is illustrated in Figure 1 (c) above where the supply curve is absent.

- iv) *Geographical Location*: The lack of brick and mortar to support the provision of banking services is prevalent in most rural areas in sub-Saharan Africa and presents a significant barrier to inclusion. As illustrated in Figure 1 (c), the lack of supply would result in a vertical supply curve at the origin. From a consumer choice framework perspective, geographic isolation would effectively increase the cost per transaction borne by the consumer.
- v) *Financial Literacy*: The knowledge on benefits related to procuring financial goods and services can cause an upward shift in individual or aggregate demand curves leading to increased financial inclusion. In the two-goods consumer choice framework, this knowledge can impact the shape of the indifference curve to reflect an increased preference for financial services.
- vi) *Cost of Financial Services*: Financial services offered by banks may be in most instances too costly for poorer households. A decrease in cost of services could therefore promote inclusion, which would be illustrated by a downward shift in the supply curve in Figure 1 (b). From an aggregate supply perspective, an outward shift of the supply curve could increase inclusion. On a macro level, this can be achieved through financial intermediation that would encourage conducive policies or facilitate the use of economies of scale by local banks, which would lead to reduced costs. From a two-goods consumer choice framework a reduction in financial cost would influence the choice of financial services from a basket of consumables.

2.5 Review of Empirical Literature

Mbiti and Weil (2011) assessed the impact of M-Pesa on financial access in Kenya and found that it lowered the inclination of the lower income demographic to use informal savings channels and raised the likelihood of M-Pesa users being banked. They also found a correlation between use of the service and increased individual/household outcomes through promoting banking and increasing money transfers.

Nyagah (2013) found that mobile money made a significant contribution to the SME sector in Kenya. The efficiency and reliability of mobile banking channels led to increased reliance on the service as opposed to formal banking channels, which led to utility and growth of the

platform. It was also found to have a positive impact on traders' sales. He, however, found that majority of respondents had increased reservations about cost and the problems associated with functionality of the service.

Everlyne (2013), in his study of the impact of M-Shwari on financial inclusion, found that the product improved financial access through allowing customers to deposit and save as little as US\$ 0.01. It also increased loan access to the lower demographic who would be unable to qualify for loans from banks and microfinance institutions and had to rely typically on savings-led community schemes. He found that access to loans was a strong determinant of financial inclusion with use the service.

Oyier (2015), in analysing the influence of financial institutions/services on how people spend their disposable income, found that new forms of financial access facilitate a change in the way people use their money. It assists in managing cashflows when faced with irregular income and access to funds was cited as the primary motivation for using M-Shwari. Interest-bearing savings and ease of access to deposited funds in the case of emergencies was a benefit, allowing people to deal with emergencies when they arose. It also helped people keep track of money, as statements are readily available for a small fee.

Olela and Nzioki (2016) assessed the impact of M-Shwari on financial inclusion among farmers in Muhoroni County in Kenya. The service was particularly effective for the farmers, given their remote location, and provided safe, easy and affordable financial access. Olela and Nzioki found that while transaction access had a statistically significant effect on usage, suitability of the product exhibited the greatest statistical significance. In their study in which they employed the use of the descriptive research method, they were able to establish that innovative products like M-Shwari helped in overcoming barriers to inclusivity by increasing accessibility and providing a safe proximal source to inclusive financial systems. They also established that M-Shwari provided a convenient and a less factitious avenue, thus helping overcome financial market frictions.

Koyo (2017) examined the impact of M-Shwari on access to credit for SMEs in Kiambu County in Kenya. His study found a positive correlation with product affordability and access to credit, which reinforces the stance that when a product is affordable and accessible, it influences inclusion positively and significantly. Abayo and Oloko (2015), in assessing the effect of micro-credit on SME growth with a focus on M-Shwari, found that knowledge on micro-credit, easy access to investable capital, and existing regulatory framework have a

significant impact on the asset growth of SMEs. Agola (2017), who examined the effects of access to M-Shwari on employment and investment in youth-owned SMEs in Ongata Rongai in Kenya, found that it played a critical role in easing consumption, meeting basic needs, replenishing business stock and smoothing cashflow in youth-owned SMEs. On employment, a few youth owned-SMEs believed that M-Shwari loans facilitated investments although the regression showed no correlation.

2.6 Chapter Summary

Although the concept of financial inclusion initially arose in relation to lack of access to banking services in the traditional brick and mortar sense, it has since evolved significantly to encompass responsible and sustainable delivery of suitable and affordable financial products and services, to individuals and entrepreneurs that meet their needs. Financial inclusion is now considered a key determinant for equitable growth in emerging economies. For the purposes of the study, financial inclusion is defined as usage of the M-Shwari product.

The contribution of financial innovation to financial development and subsequently to economic growth is considerable, as indicated in the theories discussed above. Financial intermediation theory guides the assessment of access to safe, fair, transparent and affordable finance as a pre-requisite to enabling better integration of socially and economically excluded persons. The modern growth theory holds that better financial systems improve the probability of successful innovation and thereby accelerate economic growth. The study overlays these theories with a discussion on demand, supply and consumer choice theory to better understand determinants of financial inclusion from an individual perspective.

The impact of innovation and mobile money in advancing the financial inclusion agenda in Kenya has been astounding, which is echoed in the empirical studies that have been conducted. These have, however, primarily leaned on access to SMEs, select groups of entrepreneurs, e.g. farmers, but not the wider population and therefore indicate a knowledge gap on financial access to individuals in a holistic sense.

Therefore, the study seeks to answer the research question:

What are the determinants of financial inclusion?

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter discusses the proposed research methodology for the study. It starts by outlining the research design that was implemented, followed by a description of the target population. Thereafter it elaborates on methods/instruments/packages used in analysis of the data, including a description of the analytical model used to assess the data and goes on to explain how the strength and relationship of variables was determined.

3.2 Research Design

The research method adopted for this study was a descriptive survey design and it was analysed using an explanatory regression technique. This research opted for descriptive research to allow determination and reporting on the current status of the population under study, assessing two or more variables (Mugenda, & Mugenda, 1999). The study employed structured questionnaires, which comprised both open-ended and closed-ended questions to collect primary data. The questionnaires were developed with the objectives of the study in mind. The research provided 300 questionnaires for purposes of data collection.

3.3 Sample Size

The study was conducted in the Kibera slum in Nairobi County in Kenya and data was collected over a period of six months (June 2017–December 2017), covering a population of 250,000 persons, which is the population of Kibera. At the 99% confidence level and 10% margin of error, the total population size of Kibera gives an ideal sample size of 166. Three hundred questionnaires were floated with the intention of getting to the ideal sample size. One hundred and eighty five questionnaires were collected but when these were checked for completeness for use in the study, the researcher ultimately obtained a sample of 146 for review and analysis. Kibera is one of the largest slums in Kenya and urban slums in Africa. This choice was informed by the researcher's intention to target income earners at the lowest end of the economic spectrum and to understand how M-Shwari has impacted their finances. Respondents were selected through simple random sampling. Of the sample population, 36% were women, while 64% of the population were men (see Table 2). All respondents were above the age of 18 years, which is a requirement to register for M-Pesa, the gateway application to M-Shwari.

Table 2. Sample of the Target Population

Target Category	Frequency	Percentage
Men	93	64 percent
Women	53	36 percent
Total	146	100 percent

Source: Primary Data

3.4 Analytical Framework

The following conceptual model was used for the regression analysis:

$$Y = f(X_1, \dots) \quad 1$$

Building on the conceptual model above, the following analytical model was used to examine the data:

$$Y_i = \alpha + \beta_1 X_i + \varepsilon_i \quad 2$$

where Y_i is defined as the deposit offering with M-Shwari (measured as the value of deposits made in the last six months), the access of loan with M-Shwari (measured as the value of loans in the last six months). An additional proxy for Y_i is defined as the usage of M-Shwari for deposits, measured as 1 if respondent used the M-Shwari platform for deposits and zero otherwise. For all three models, the predictor variables (X_i) are age, gender, income, education, employment and dependants. The constant is α and β_i are the beta coefficients, depicting various significance levels of the predictor variables. ε is the error term.

$$MS(6mdep)_i = \alpha + \beta_1 Age_i + \beta_2 gender_i + \beta_3 income_i + \beta_4 edu_i + \beta_5 employment_i + \beta_6 dependents_i + \varepsilon_i \quad 3$$

$$MSdep_i = \alpha + \beta_1 Age_i + \beta_2 gender_i + \beta_3 income_i + \beta_4 edu_i + \beta_5 employment_i + \beta_6 dependents_i + \varepsilon_i \quad 4$$

$$MS(6mloans)_i = \alpha + \beta_1 Age_i + \beta_2 gender_i + \beta_3 income_i + \beta_4 edu_i + \beta_5 employment_i + \beta_6 dependents_i + \varepsilon_i \quad 5$$

Where $MS(6mdep)_i$ and $MS(6mloans)_i$ represent deposits and loans through M-Shwari in the last six months and $MSdep_i$ is the usage of M-Shwari deposits dummy. All other variables are as defined before.

The estimation of the empirical model 4 was done using logistical regression technique, defined as:

$$P_i = \frac{1}{1 + e^{-Y_i}}$$

where P_i is the probability of an individual using M-Shwari. The probability that an individual does not use M-Shwari can be written as

$$1 - P_i = \frac{1}{1 + e^{Y_i}}$$

The ratio of the two probabilities can be expressed as

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{Y_i}}{1 + e^{-Y_i}} = e^{Y_i}$$

The $\left[\frac{P_i}{1 - P_i}\right]$ ratio is the odds ratio in favour of using the M-Shwari product.

3.4.1 Definition and Measurement of Variables

The dependent variable under study is the utilisation of M-Shwari's deposit and loan features. The description of the independent variables are presented below.

Gender: The analysis makes accommodation for respondents being either male or female. According to the FinAccess report on Kenya (FSD, 2016), there has been increasingly more uptake of mobile bank accounts like M-Shwari and KCB M-Pesa by young urban males. Uptake patterns for mobile bank accounts mirror traditional bank accounts, with two thirds as many men using these new solutions as compared to women. Traditional banks and financial markets have been relatively inaccessible to women for a number of reasons linked primarily to barriers of entry. These are associated with lower levels of education, lack of employment opportunities, lower income levels and lack of property ownership. Banks often require documentation and minimum deposits to open accounts and maintain them. The lack of the required documents and affordability are one of the reasons identified as creating barriers to

access financial services for the general population. This problem is faced even more so by women, who may not have the same property rights as men, thus creating additional barriers to uptake of financial services. Although the study sample was predominantly male, the study sought to shed light on whether indeed men had a greater propensity for the M-Shwari service as compared to their female counterparts.

Age: This is a significant factor in uptake of mobile interventions. The study defined five broad age brackets from the age of 18 upwards. These are ‘Below 20 years’, ‘21–30 years’, ‘31–40 years’, ‘41–50 years’ and ‘Above 50 years’. The FinAccess report on Kenya (FSD, 2016) finds that youth aged 18–25 years have been very receptive to mobile banking, on par with traditional bank accounts. However, as the population ages, the gap between usage of traditional and mobile bank accounts widens, the former being more popular. Mobile banking solutions require some technical aptitude and the younger generation, who are more technologically inclined, would tend towards mobile banking solutions more so than their older counterparts would. Although this may be the case if the study extended beyond just low-income earners, due consideration needs to be given to the fact that the younger demographic has just finished school/university and may not have an income stream to support their utilisation of the M-Shwari service. Thus, for this particularly study, it is anticipated that the older generation may have higher utility of the service.

Education: Due consideration was given to the highest level of education achieved by the respondents. The study defined five data points across the education spectrum, i.e. ‘No formal education’, ‘Primary education’, ‘Secondary education’, ‘Tertiary education’ and ‘Other’. ‘Other’ alluded to those who had no formal education but had received some form of training/apprenticeship in vocations like blacksmithery and carpentry. Education has been a key factor highlighted in uptake of mobile interventions related primarily to user education of mobile technologies and ability to synthesize information, particularly on mobile-based loan interventions, that can tend to have punitive interest rates.

Employment: This variable sought to assess the respondents’ main income stream. ‘Employed’ individuals were those who received, with some regularity, salaries or wages. ‘Self-employed’ individuals were those who were not employed but engaged in some sort of activity from which they derived an income. ‘Unemployed’ were defined as those having no income streams.

Income: This alluded to the amount of money, on average, that respondents' received on a month basis. The study defined four income brackets, i.e. '0–10,000 Kshs', '11,000–51,000 Kshs', '51,000–100,000 Kshs' and 'Above 100,000 Kshs'.

Dependants: This variable sought to assess the financial capacity of respondents and any income pressures that may either increase or hamper their need for the service, i.e. through borrowing to cater to a larger household or depositing to save towards education and health needs for their dependants. This is a continuous variable representing the number of dependants of each respondent.

3.4.2 Estimation Techniques

To carry out the regression, the study gave due consideration to linear regression (Ordinary Least Squares) and logistical regression methods, two statistical methods used in the data analysis. Logistic regression is used in the analysis of datasets in which one or more independent variables are used to determine an outcome (dependent variable) that is dichotomous, i.e. has only two possible outcomes. It is useful where there is the ability to predict the presence or absence of an outcome based on a set of predictor variables. The co-efficients of the independent variables in a logistical regression can be used as an estimate of the odds ratio, which quantifies the relationship between an exposure and an outcome. It measures the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure. This study considered the odds of the sample depositing in M-Shwari (dependent variable) given a set of predictor variables, i.e. gender, age, education, income, employment and dependants. Linear regression involves one or more independent variables and is used in determination of the coefficients of the linear equation that best predicts the value of the dependent variable. In this case, the study aimed to predict financial inclusion, measuring this as number of loans and deposits made and taken over the past six months (dependent variable) from independent variables such as gender, age education, income, employment and dependants. Linear regression is continuous and used in discriminant analysis while logistic regression is discrete and used to ascertain the probability of an event, which is captured in binary format, i.e. 0 or 1 (Schroeder, Sjoquist, & Stephen, 2016). The study used linear regression to assess the overall explanatory relationship between the independent variables (determinants) and the dependent variables (use of M-Shwari product). The logistical regression was employed to examine the likelihood of the use of M-Shwari against the different individual independent variables.

3.4.3 Strength and Viability of Determinants

The researcher used SPSS to carry out a regression analysis. The odds ratio was used to determine strength and association between independent variables and financial inclusion (using the three dependent variables described above as the proxies). R-square and X-square tests were used to assess fitness of model and to determine the extent to which the independent variables jointly account for financial inclusion. Regression of co-efficients was used to establish a causal relationship between the determinants and financial inclusion, while the probability of the t-test statistics explained the overall significance of the models at the 1%, 5% and 10% significance levels.

CHAPTER FOUR

DISCUSSION OF FINDINGS

4.1 Introduction

This chapter describes the results obtained from data collected from the questionnaires, discusses, and analyses this data in detail.

4.2 Sample Characteristics

The descriptive statistics of the sample are summarised in Table 3 below. For this study, 146 respondents were interviewed over a span of six months (June 2017–December 2017). Of the 146, 36% were women and 64% were men. Respondents were selected through random sampling. All respondents were above the age of 18 years, which is a requirement to register for M-Pesa, the gateway application to M-Shwari. While M-Pesa provides only for e-wallet and remittance services, M-Shwari allows clients to earn interest on their deposits and also avails loans to users. According to the FinAccess report on Kenya there has been increasingly more uptake of mobile bank accounts like M-Shwari and KCB M-Pesa by young urban males (FSD, 2016). Uptake patterns for mobile bank accounts mirror traditional bank accounts, with two thirds as many men using these new solutions as compared to women. Traditional banks and financial markets have been relatively inaccessible to women for a number of reasons linked primarily to barriers of entry. These are associated with lower levels of education, lack of employment opportunities, lower income levels and lack of property ownership. Banks often require documentation and minimum deposits to open accounts and maintain them. The lack of the required documents and affordability are reasons identified as barriers to accessing financial services for the general population. This problem is faced even more so by women, who may not have the same property rights as men, thus creating additional barriers to uptake of financial services.

Age is viewed as a significant factor in uptake of mobile banking solutions. The majority of the respondents, accounting for 27% and 36% of the sample pool, fell within the 21–30 and 31–40 age brackets, respectively. The FinAccess report on Kenya (FSD, 2016) finds that youth aged 18–25 years have been very receptive to mobile banking, on par with traditional bank accounts. However, as the population ages, the gap between usage of traditional and mobile bank accounts widens, the former being more popular. Mobile banking solutions require some technical aptitude and the younger generation who are more technologically

inclined would tend towards mobile banking solutions as compared to their older counterparts. Before the inception of M-Pesa, familiarity with mobile phones had been flagged as a hurdle in the pilot phases (Hughes, & Lonie, 2007). The Kenyan landscape has, however, changed dramatically with mobile penetration at 88.1% as of 2017 (Communication Authority of Kenya, 2017). This implies that an increasing number of people are now more educated with regard to basic mobile operations.

With regard to the level of education, only 5% of respondents had tertiary education, 25% had completed education to the primary school level and 46% had completed up to secondary education. Approximately 10% of the respondents chose 'other', which was an indication that they had received some form of training/apprenticeship in vocations like blacksmithery and carpentry, while 14% of the sample had no formal education.

Employment statistics were in line with expectations, given the demographics of the Kibera area, with 36% reporting self-employment, 8% unemployment and 56% in steady employment. Those who reported steady employment were primarily casual labourers in the surrounding areas. A number of people also come from the rural areas to the capital city of Nairobi seeking better livelihoods and given the difficult job market climate, they end up being forced into odd jobs in a bid to make ends meet and can only afford to stay in areas such as Kibera. Building on this, the 62% of people interviewed earned between Kshs 11,000–50,000 (US\$ 110–500) per month, 27% fell in the Kshs 11,000–50,000 (US\$ 0–100) income bracket, with the remaining 11% earning Kshs 51,000–100,000 (US\$ 510–1000). Even with the modest incomes that they earn, 48% of the respondents reported having two dependants or more, which indicated a stretching of the little finances they had.

Table 3. Sample Characteristics

		Frequency	Percentage
Gender	Male	93	64%
	Female	53	36%
Age	Below 20 years	11	8%
	21-30 years	40	27%
	31-40 years	52	36%
	41-50 years	25	17%
	Above 50 years	18	12%
Education	No formal education	21	14%
	Primary	36	25%
	Secondary	67	46%
	Higher	8	5%
	Other	14	10%
Employment	Employed	81	56%
	Self-Employed	52	36%
	Unemployed	13	8%
Income	0 - 10000 Kshs	39	27%
	11000 - 50000 Kshs	91	62%
	51000 - 100000 Kshs,	16	11%
	Above 100000 Kshs		0%
Number of Dependants	1	35	24%
	2	32	22%
	3 and above	38	26%
	None	41	28%
CRB	Yes	53	36%
	No	93	64%

4.3 M-Shwari Usage Profile

Table 4 below illustrates the M-Shwari usage profile. M-Shwari was introduced in November 2012 and the uptake and usage of the product since then has been remarkable. As of December 2017, M-Shwari had disbursed \$2.3 billion in loans and received \$6.7 billion in deposits, providing services to over 21 million Kenyans (Safaricom, 2017). Data from CBA estimates that the platform receives approximately 300,000 loan applications a day, with between 70,000–100,000 disbursed.

The majority of the sample indicated using M-Shwari for withdrawals (loans) rather than deposits (143 vs. 119). Frequency of deposits for most of the respondents was on a monthly basis and linked primarily to receipt of their income, with the majority of those who deposited reporting approximately 0–25% of their total deposits being in M-Shwari. The preference for respondents, who were employed and had the option to do so, was depositing

with their associated SACCOs. These offer a wider range of benefits over and above those of M-Shwari, including higher loan amounts and lower interest rates on loans with flexible repayment conditions. The majority of the respondents, approximately 62%, appeared to take loans on a need basis, when an emergency or expense arose that they were unable to cover from other income.

Linked to credit limits, the majority of the respondents, approximately 53%, borrowed between Kshs 0–10,000 (US\$ 0–100). This is significantly correlated to the income of this demographic and their M-Shwari deposit history.

Table 4. M-Shwari Usage

		M-Shwari Deposits		M-Shwari Loans	
		Freq.	Percent	Freq.	Percent
Access	Yes	119	81.51	143	97.95
	No	27	18.49	3	2.05
Deposit in 6 Months	0 - 10000 Kshs	60	50.85		
	11000 - 50000 Kshs	58	49.15		
Borrowed (6 months)	0 - 10000 Kshs			76	53.15
	11000 - 50000 Kshs			67	46.85

4.3.1 Deposits and Savings

Table 5 below depicts the deposit profile of the respondents. Of the total sample, 82% reported making deposits into M-Shwari, 38% of whom were women. M-Shwari interest rates were previously in the range of 2–5%, although these are now converging more to the Central Bank Rate (CBR) and will be increased to about 7.35% (70% of the CBR) in 2017. M-Shwari’s interest rate has not been lauded as its greatest benefit. However, it allows low-income Kenyans to save for short-term needs while also increasing access to credit in the future. M-Shwari savings help customers manage liquidity for emergencies or short-term needs while diversifying their options for future needs.

Table 5. M-Shwari Deposit Profile of Respondents

		Frequency	Percent
Increases	Yes	79	67%
	No	39	33%

Figure 4. Top reasons for Depositing with M-Shwari

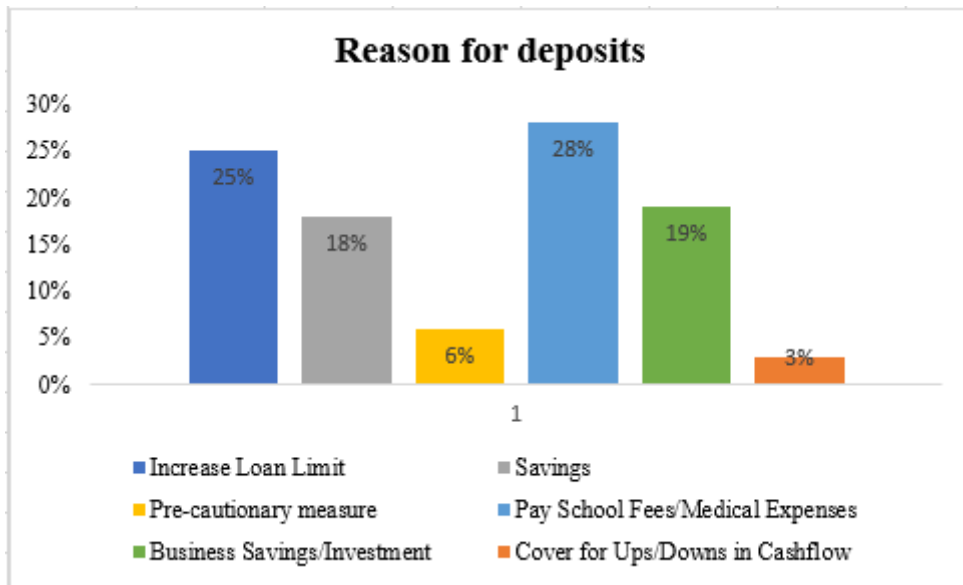
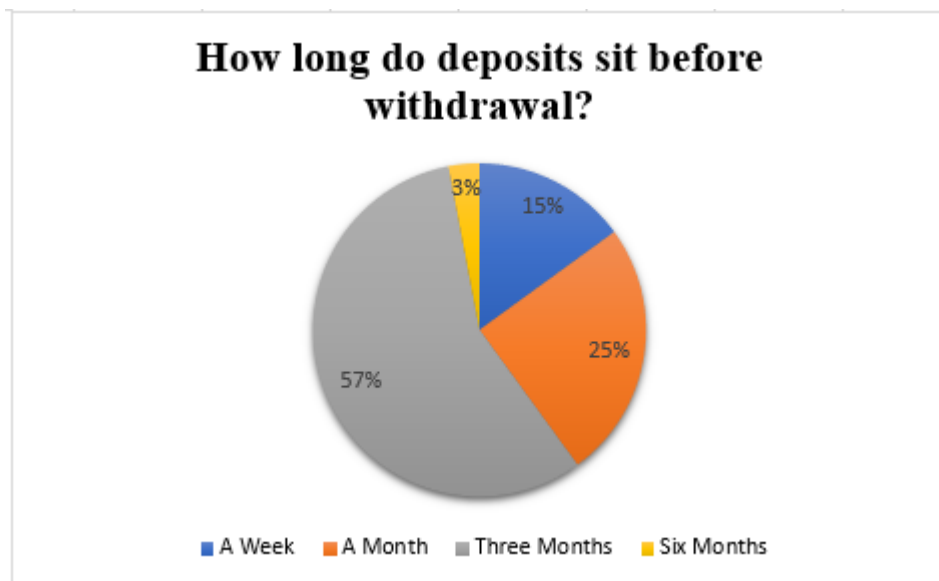


Figure 5. Duration of Deposits



The sample indicated the frequency of deposits as monthly (64%), weekly (26%), ‘other’, which primarily alluded to saving as and when a specific goal arose (8%), and quarterly (2%). Most savings purposes related to paying for school fees and emergencies, and increasing their loan limits. The top reasons for depositing with M-Shwari are captured in Figure 4 above. Despite the lack of a deeper understanding of the full workings of the M-Shwari credit scoring algorithm, customers are attuned to the fact that loan limits are linked

to savings behaviour. Therefore, to maximize their loan limits, they deposit money into their accounts. M-Shwari savers tend to save the bare minimum, without a definitive goal in mind, the simple rationale being that they prefer to have the majority of their assets liquid. Although there was appetite from some respondents to save substantial amounts towards specific goals, there is scant evidence so far of users having built up large savings through the platform. Additionally, based on findings thus far of how lower income households accumulate assets in Kenya, M-Shwari may be unsuitable for this purpose. In the last six months leading up to the study, 51% of the respondents had deposited between Kshs 0–10,000 (US\$ 0–100), while 49% had deposited between Kshs 11,000–50,000 (US\$ 110–500). The duration of deposits for the sample is captured in Figure 5 above. Of the respondents, 15% reported that savings remained in their account for a week before they withdrew, 25% withdrew after a month, 57% after three months and 3% after six months. A number of respondents reported using other institutions for deposits, i.e. Bank (20%), MFI (38%), SACCOs (23%), Hiding place (14%) and Chama (5%). Within the sample, M-Shwari’s main competition for deposits is MFIs. This is primarily due to more favourable interest rates on deposits and respondents appreciated the fact that the money was less visible comparable to M-Shwari and required extra steps to access which provided extra discipline for them.

4.3.2 Loans and Withdrawals

Table 6 below depicts the loan profile of the respondents. M-Shwari, with its loan offering, has provided a platform to mobilise much needed resources. The main reasons for borrowing for the sample was for emergencies (41%), to cover for ups/downs in cash flow (34%), and for business expenses/investment (21%). Linked to loans for business expenses and investments, with 36% of the sample reporting self-employment, this may allude to M-Shwari as an enabler of businesses and SMEs and may provide a premise to expand use of the service to small business owners. Only 4% of the sample used M-Shwari loans to cover daily/routine expenses. Over half of those who borrowed from M-Shwari repaid their loans in the first 30 days, 37% repaid within a 60-day window, which indicated they paid double interest on their loans (i.e. 7.5% interest rate per month), and 10% reported paying their loan after 60 days, which is the final deadline. A significant 36% of the sample reported being listed on the Credit Reference Bureau (CRB) as a result of non-payment of loans. This highlights some of the downsides of digital lending with regard to customer education gaps, particularly within the lower income demographic that may not fully understand terms and conditions of the products they utilise. Access to credit needs to go hand in hand with

sufficient knowledge of how it works to ensure those below the poverty line do not fall deeper into debt and further into poverty.

Table 6. M-Shwari Loan Profile of Respondents

		Frequency	Percent
Increases	Yes	75	52
	No	68	48
Reason	Cover for Ups/Downs in cashflow	48	34
	Cover daily expenses	3	2
	Pay for School Fees/Medical Expenses	3	2
	Emergencies	59	41
	Business Expense/ Investment	30	21
Loan Repayment	30 days	75	52
	31-60 days	53	37
	61-90 days	12	8
	Over 90 days	3	2
		143	100

From the sample, M-Shwari appears more prominent as a source of loans than as a means of savings. Overall, the indication is that it is a complementary product to augment other loan and deposit products and services, either formal or informal that the respondents are using. The indication is that it is not viewed as a viable substitute to other financial products and services but simply as a complementary product. Therefore, M-Shwari accounts for a minimal proportion of respondents' overall deposits/savings and loans, with most respondents reporting use of at least one other financial institution.

4.4 Regression Results

The regression analysis was undertaken using three models to assess financial inclusion: (i) utilisation of M-Shwari's deposit offering, (ii) number of deposits made in the last six months and (iii) number of loans taken in the last six months, as the dependent variables. A separate model on utilisation of loans could not be run due to insufficient observations on the part of those who do not use the M-Shwari loan service, i.e. only three respondents indicated not using M-Shwari loans. The fitness of the models was then assessed and analysis carried out on the impact of gender, age, education, employment, income and dependants on these three financial inclusion proxies. The variance inflation factors, which assess the independence of each independent variable, are presented in each regression output and indicate the absence of multicollinearity.

4.4.1 Use of Deposits and Savings

The results of the logistic regression on the determinants of the usage of M-Shwari deposits or not is presented in Table 7 below. In the analysis of the utilisation of M-Shwari's deposit offering, odds ratio was employed to assess fit of model and to explore the relationship between the dependent and predictor variables.

The probability of $\chi^2 < 0.01$ indicates fit of model and that the model does have explanatory power with regard to predictor variables having an impact on the dependent variable. The pseudo R-Squared value of 0.3064 implies that 30.64% of the variation in utilisation of M-Shwari deposits is attributable to the six predictor variables, namely gender, age, education, employment, income and dependants.

Table 7. Usage of M-Shwari Deposits

	Odds Ratio	z	VIF
Constant	0.002*** (0.004)	-3.31	
2.GENDER	1.078 (0.683)	0.12	1.21
AGE	1.195 (0.291)	0.73	1.03
EDUCATION	1.558* (0.375)	1.84	1.04
EMPLOYMENT	0.521 (0.316)	-1.07	1.34
INCOME	10.225*** (5.970)	3.98	1.18
DEPENDANTS	0.649* (0.152)	-1.85	1.03
LR χ^2 (6)	42.84		
Prob > χ^2	0.0000		
Pseudo R-squared	0.3064		
Observations	146		

Note: VIF=Variance inflation factor. *** and * denotes significance at 1% and 10% respectively.

In the analysis, education, income and dependants showed a statistically significant relationship to the utilisation of the M-Shwari deposit feature. With regard to education, an increase in education level indicates a 55.8% greater likelihood of depositing in M-Shwari and this was statistically significant at the 90% confidence interval. Consistent with consumer theory discussed in the literature, financial literacy linked to education and the knowledge on benefits related to procuring financial goods and services can cause an upward shift in individual or aggregate demand curves leading to increased financial inclusion. Mndolwa

(2017) in her analysis of gender disparities in financial inclusion in Tanzania, found those with lower levels of education were less likely to own a formal account. Similarly, Lotto (2018) in his examination of the status of financial inclusion in Tanzania and its determinants, found that as the level of education increases, the individual is more likely to be financially included.

On the other hand, an increase in dependants signified a 64.9% lesser likelihood of depositing in M-Shwari. This was statistically significant at the 90% confidence interval. The income variable exhibited the strongest correlation with a 922.5% greater likelihood of depositing in M-Shwari with an increase in income. This showed statistical significance at the 99% confidence level. The number of dependants, linked to pressures on income and subsequently insufficient income, is also alluded to in the consumer theory literature as a barrier to financial inclusion. Increased income levels increase the likelihood of financial inclusion.

From the model, the age, gender and employment variables showed no statistical significance in predicting use of the M-Shwari deposit offering.

4.4.2 Determinants of M-Shwari Deposits

A regression in SPSS was conducted to assess fit of model and impact of predictor variables on the number of deposits made in the last six months.

The probability of $F < 0.01$ indicates that the model has explanatory power in relation to the dependant variable. The adjusted R-Squared value of 19.25%, which is the co-efficient of determination, indicates the variation in the dependent variable resulting from changes in the independent variables. In this case, there would be a 19.25% variation in number of deposits made in the last six months due to variations in gender, age, education, employment, income and dependants.

Table 8. Determinants of M-Shwari Deposits

	Coefficient	t	VIF
Constant	1.120*** (0.266)	4.21	
2.GENDER	0.167* (0.096)	1.74	1.25
AGE	-0.024 (0.037)	-0.65	1.04
EDUCATION	-0.019 (0.039)	-0.49	1.02
EMPLOYMENT	-0.138* (0.071)	-1.96	1.34
INCOME	0.345*** (0.082)	4.2	1.13
DEPENDANTS	0.023 (0.040)	0.58	1.04
F-test	5.65		
Prob>F	0.0000		
R-Squared	0.2339		
Adjusted R-Squared	0.1925		
Root MSE	0.45115		
Observations	118		

Note: VIF=Variance inflation factor. *** and * denotes significance at 1% and 10% respectively.

The results in Table 8 above show a positive and statistically significant relationship between gender (female) and number of deposits made in the last six months ($\beta=0.167$, $t=1.74$, $p\text{-value}<0.1$) at a 10% significance level. The implication of this is that everything being equal, being female increased the likelihood of M-Shwari deposits by a factor of 0.167. While women have previously been excluded from formal finance channels owing to lower levels of education, lack of collateral and lower business acumen, the landscape appears to be shifting and descriptive statistics in Kenya show a greater propensity for women to utilise informal banking channels. Fanta, Mutsonziwa, Goosen and Emanuel (2016) in their study on the role of mobile money in financial inclusion in the Southern African Development Community (SADC) region, found mobile money accounts to be a useful tool in closing the gender gap in financial inclusion in the region.

The employment status of respondents exhibited a negative and statistically significant relationship to the dependant variable ($\beta=0.138$, $t=-1.96$, $p\text{-value}<0.1$) at a 10% significance level. This would indicate that holding all other factors constant, being employed decreased the chances of depositing by a factor of 0.138. Owing to a reliable source of income, employed individuals would have a number of options at their disposal in terms of both

formal and informal financial service providers, with a majority of them owning formal accounts that may offer superior benefits to those offered on the M-Shwari platform. Fanta et al. (2016) found a higher likelihood of formal account ownership among those in employment.

The level of income also indicated a positive and statistically significant correlation to the dependant variable ($\beta=0.345$, $t=4.2$, $p\text{-value}<0.01$) at a 1% significance level. Income indicated the strongest correlation to number of deposits, implying that with all else being equal, an increase in income increased the number of deposits by a factor of 0.345.

While age and education showed no statistical significance, they appeared to be correlated negatively to the number of deposits, indicating that with increase in age and education, people were less likely to deposit with M-Shwari.

4.4.3 Determinants of M-Shwari Loans

The resulting model from the regression of loans taken in the last six months is summarised in Table 9 below.

The probability of $F<0.01$ indicates that the model has explanatory power in relation to the dependant variable. The adjusted R-Squared value of 0.1958 indicates a 19.58% variation in number of loans taken in the last six months due to variations in gender, age, education, employment, income and dependants.

Table 9. Determinants of M-Shwari Loans

	Coefficient	t	VIF
Constant	0.799*** (0.236)	3.38	
2.GENDER	0.220** (0.086)	2.55	1.22
AGE	0.032 (0.034)	0.95	1.03
EDUCATION	-0.096*** (0.035)	-2.75	1.04
EMPLOYMENT	0.010 (0.067)	0.16	1.36
INCOME	0.241*** (0.069)	3.5	1.19
DEPENDANTS	0.115*** (0.034)	3.42	1.03
F-test	6.76		
Prob>F	0.000		
R-Squared	0.2298		
Adjusted R-Squared	0.1958		
Root MSE	0.44907		
Observations	143		

Note: VIF=Variance inflation factor. *** and ** denotes significance at 1% and 5% respectively.

Similar to deposits, income showed the strongest positive and statistically significant relationship to number of loans ($\beta=0.241$, $t=3.5$, $p\text{-value}<0.01$) at a 1% significance level. With an increase in income, respondents were likely to increase number of loans taken by a factor of 0.241.

The second strongest and positive correlation was attributable to number of dependants ($\beta=0.115$, $t=3.42$, $p\text{-value}<0.01$) at a 1% significance level. Intuitively, this indicated that respondents with a larger number of dependants were more likely to have taken a loan in the past six months. An increase in the number of dependants increased the likelihood of having taken a loan by 0.115. A higher number of dependants would put pressure on income, thus forcing individuals to seek supplemental sources in the form of loans.

Education exhibited a strong negative correlation to the number of loans taken ($\beta=-0.096$, $t=-2.75$, $p\text{-value}<0.01$) at the 1% significance level. The implication of this could be that those who were better educated were in a better position to weigh the pros and cons of loans from M-Shwari versus other sources. The shortcomings of M-Shwari loans are the small amounts, high interest rates, inflexible repayment conditions and thus a higher likelihood to opt for

other sources of finance. An increase in education reduced the likelihood of having taken an M-Shwari loan in the last six months by a factor of 0.096.

Similar to deposits, being female was positively and significantly correlated at a 5% significance level to the number of loans taken in the past six months ($\beta=0.220$, $t=2.55$, $p\text{-value}<0.05$). Although age showed positive correlation to number of loans taken, it exhibited no statistical significance within the context of the sample.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses key findings from the data and draws conclusions, and makes recommendations and suggestions on areas for further research.

5.2 Summary

The motivation for this study was to assess the impact of M-Shwari on financial inclusion of low-income earners in Kenya and further glean from the assessment, the determinants of financial inclusion. At inception of the study, and to date, there had been little research into how the population on an individual level in Kenya is using the M-Shwari product and its subsequent impact on their financial well-being. The studies in the literature have primarily leaned on its impact on SMEs and select groups of entrepreneurs.

This study focused on individuals living in the Kibera slum in Nairobi, which provided a representative sample of low-income earners in the Kenyan population. While Kenya has made great strides in financial inclusion, with only 17% of the population completely excluded as of 2016, it is important to gain an understanding of how these innovative products are being utilised, particularly by this segment of the population, and whether indeed they are being lifted out of poverty and integrated into the formal financial system as a result. The analysis was conducted from June–December 2017 with a total sample of 146 respondents. Low-income earners within the context of the sample can be defined as those earning approximately Kshs 0–100,000 (US\$ 0–1,000) per month. The majority of the respondents, 62%, earned between Kshs 11,000–50,000 (US\$ 110–500) per month.

The sample indicated a greater propensity for men to use the M-Shwari product, although it is important to note that given the small size of the sample and constraints in data collection, this may not be representative of the wider population. M-Shwari proved more popular as a source of loans than as a store for deposits. The top reasons for taking loans were listed as emergencies, to cover for ups and downs in cashflow, and for business expenses and investments. The product is increasing financial inclusion in this demographic by helping respondents manage fluctuations in cashflow and giving them access to emergency microloans to help them prevent, cope with and recover from unexpected financial shocks. Picking up on the element of loans for investment in business, and with 36% of the sample

reporting self-employment, there could be a case to be made for M-Shwari as an enabler of businesses and SMEs and there may be scope to expand use of the service to small business owners. The product is allowing this demographic to engage in broader economic activities through enhanced savings and investment cycles. However, 36% of the sample reported being listed by the CRB, which indicates that at some point they had failed to repay their M-Shwari loan after 60 days. Within the first 30 days of borrowing, a 7.5% facilitation fee is applicable. After an additional 30 days (60 days in total), the total facilitation fee goes up to 15%. Additionally, on failure to repay within the first 30 days, an amount equivalent to the borrowings plus facilitation fee is frozen in the M-Shwari deposit account. Failure to repay after the 60-day period and if M-Shwari is unable to recover the money from the deposit account, results in the client being listed on CRB. This implies a minimum of five years and a maximum of seven years restriction from borrowing money from any financier. Thirty-six percent is a staggering number for such a small sample and this begins to highlight some of the downsides of digital lending, with regard to customer education gaps and a lack of understanding of terms and conditions of the products they are taking on. Access to credit needs to go hand in hand with sufficient knowledge of how it works, to ensure those below the poverty line do not fall deeper into debt and further into poverty.

Regarding deposits, the main reasons stated were saving up to pay for school fees, medical expenses, and to increase loan limits. Despite lack of a deeper understanding of the full workings of the M-Shwari credit-scoring algorithm, customers were attuned to the fact that loan limits are linked to savings behaviour. Therefore, to maximize their loan limits, they deposit money into their accounts. The majority of the respondents reported having 0–25% of their deposits in M-Shwari while the rest had deposits in other financial institutions.

The regression analysis defined three proxies for financial inclusion through use of the M-Shwari product, i.e. utilisation of M-Shwari's deposit offering, number of deposits made in the six months leading up to the study, and number of loans taken in the six months leading up to the study. With regard to utilisation of M-Shwari's deposit offering, level of education, level of income and number of dependants were the strongest determinants of financial inclusion. For deposits made, gender, employment and income were the most statistically significant determinants. From the sample, women were more likely to have made deposits over the past six months, while those who were employed were less likely to have made deposits over the past six months. Gender, level of education, level of income and number of dependants were the strongest determinants for those who had taken loans in the past six

months. Women had a greater likelihood of taking loans, while those with a higher level of education seemed less inclined to take loans from M-Shwari. The implication of this could be that those with a higher level of education were in a better position to weigh the pros and cons of loans from M-Shwari versus other sources. The shortcomings of M-Shwari loans are the small amounts, high interest rates, inflexible repayment conditions, and thus a higher likelihood to opt for other sources of finance. Additionally, those with a higher level of income and a greater number of dependants were more likely to have taken loans over the past six months. For all three models, income was the greatest statistically significant determinant for use of the product and subsequently financial inclusion.

5.3 Conclusion and Recommendations

From the study, it can be concluded that M-Shwari has had a positive impact on financial inclusion of low-income earners in Kenya. It has increased their access to loans and interest-bearing savings accounts, thus helping respondents manage fluctuations in cashflow and giving them access to emergency microloans to help them prevent, cope with and recover from unexpected financial shocks. While M-Shwari on the whole is enhancing financial inclusion of this demographic, it is not viewed as a viable substitute for other financial products and services but simply as a complementary product. Therefore, M-Shwari accounts for a minimal proportion of respondents' overall deposits/savings and loans, with most respondents reporting use of at least one other financial institution. Banks, SACCOs, MFIs and Chamas are some of the other institutions that respondents use, as these offer higher interest rates on deposits, longer loan tenors, lower interest rates on loans and relatively flexible repayment conditions, among other benefits. Although M-Shwari has proved to be a very popular product among many individuals, a few enhancements could make the product more suited toward the goal of enhanced financial inclusion for low-income earners. One suggestion is to limit frequency of withdrawals from the deposit account to perhaps once every three months. This would drive a savings culture and help clients and users think longer term and save toward bigger goals. Not only would this increase earnings on deposits through interest accrued, which could be considered a form of investment, it could also result in larger loan limits based on the amounts accrued in deposit accounts, which would allow users to embark on larger ventures. Drawing on economies of scale, M-Shwari should be able to offer lower interest rates and longer loan tenors, even for smaller loans, to help maximise customers' productive cycle for the duration of the loan. Although M-Shwari loans are only of one-month duration, if one was to keep drawing down, the effective annual interest rate

would be 90% per annum, which is punitive. While there is a clear understanding of the riskier nature of M-Shwari loans, it is important to find a balance such that consumers are protected, their needs met and prospects for the future enhanced, while M-Shwari continues to keep their non-performing loans to a minimum and run a profitable business.

Within the context of the study, gender, employment, age, education, income and number of dependants have been flagged as key determinants for financial inclusion

5.4 Limitations of the Study

The most significant limitation of the study was lack of time and resources to interview a larger group of people, both within the rural and urban areas. This would have enabled a sample more representative of low-income earners in Kenya and allowed more comprehensive and insightful inferences on how they are using the product and how it is impacting their financial well-being. The limited sample precluded the running of a model for utilisation of M-Shwari loans, due to limited observations on those that did not opt for the M-Shwari loan offering.

5.5 Suggestions for Further Research

From the findings of the study, the researcher would recommend two areas for further research. Within the sample, albeit small, one of the top reasons for taking loans was listed as business expenses and investments. On the back of this, 36% of the sample reported self-employment. Therefore, a case could be made for M-Shwari as an enabler of businesses and SMEs and there may be scope to expand use of the service to small business owners. As this was not the primary area of research for the study, no further insight could be gleaned but this is a potential topic for further research.

Additionally, a staggering 36% of the sample reported being listed on CRB. This implies a minimum of five years and a maximum of seven years' restriction on borrowing money from any financial institution. This highlights customer education gaps and some of the downsides of digital lending. Access to credit needs to go hand in hand with sufficient knowledge of how it works to ensure those below the poverty line do not fall deeper into debt and further into poverty. Further research is needed into the swathe of instant loans and digital lending products that have flooded the Kenyan market, and the negative impact these may be having on low-income borrowers and the financial inclusion agenda.

REFERENCES

- Abayo, J. A., & Oloko, M. (2015). Effect of micro-credit on growth of small business enterprises? A case of M-Shwari at Kibuye market in Kisumu County, Kenya. *International Journal of Economics, Commerce and Management* , III(6), 1221–1246.
- Agola, M. A. (2017). *M-Shwari loan access and effects on employment and investment in youth-owned SMEs in Ongata-Rongai, Kenya*. Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/101925/Mollo_M-shwari_Loan_Access_and_Effects_on_Employment_and_Investment_in_Youth-owned_Mses_in_Ongata-rongai,_Kenya.pdf?sequence=1&isAllowed=y
- Alliance for Financial Inclusion (AFI) (2013). Defining and measuring financial inclusion: Financial inclusion in Africa. *Africa Development Bank*. 31-42.
- Beck, T., & de la Torre, A. (2005). The basic analytics of access to financial services. *Financial Markets, Institutions and Instruments*, 16(2), 79 –117. <https://dx.doi.org/10.1111/j.1468-0416.2007.00120.x>
- Bruhn, M., & Love, I. (2009). *The economic impact of banking the unbanked evidence from Mexico*. [Http://Doi.Org/10.1596/1813-9450-4981](http://doi.org/10.1596/1813-9450-4981)
- Centre for Financial Inclusion. (2011). Financial inclusion glossary. Retrieved from <http://www.centerforfinancialinclusion.org/glossary>
- Communication Authority of Kenya. (2017). *Annual Report 2017*. Retrieved from <https://ca.go.ke/downloads/publications/annual-reports/>
- Consultative Group to Assist the Poor (CGAP). (2011). *Advancing financial access for the world's poor*. Retrieved from <https://www.cgap.org/sites/default/files/organizational-documents/CGAP-Annual-Report-Dec-2012.pdf>
- Consultative Group to Assist the Poor (CGAP). (2017). *Why does M-PESA lift Kenyans out of poverty?* Retrieved from <https://www.cgap.org/blog/why-does-m-pesa-lift-kenyans-out-poverty>
- Cook, T., & McKay, C. (2015). *How M-Shwari works? The story so far*. Washington DC: CGAP Publications. Retrieved from <https://www.cgap.org/sites/default/files/Forum-How-M-Shwari-Works-Apr-2015.pdf>

- Dauda, S. R., & Makinde, O. K. (2014). Financial sector development and poverty reduction in Nigeria: A vector autoregression analysis. *Asia Economic and Financial Review*, 4(8), 1040–1061.
- De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World Development*, 23(3), 433–448. [Http://Doi.Org/10.1016/0305-750X\(94\)00132-I](http://doi.org/10.1016/0305-750X(94)00132-I)
- Demirguc-Kunt, A., & Levine, R. (2009). Finance and inequality: Theory and evidence. *Annual Review of Financial Economics, Annual Reviews*, 1(1), 287-318.
- Everlyne, P. G. (2013). *The effect of M-Shwari services on financial access in Kenya*. MBA thesis, University of Nairobi. Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/58904/Gekondo_The%20effect%20of%20m-shwari%20services%20on%20financial%20access%20in%20kenya%20%20a%20case%20study%20of%20kisii%20%20county.pdf?sequence=3&isAllowed=y
- Fama, E. F. (1980). Agency problems and the theory of the firm. *The Journal of Political Economy*, 88(2), 288-307.
- Fanta, A. B., Mutsonziwa, K., Goosen, R., & Emanuel, M. (2016). *The role of mobile money in financial inclusion in the SADC region*. Finmark Trust, Policy research paper no. 03/2016. Retrieved from <https://www.finmark.org.za/wp-content/uploads/2016/12/mobile-money-and-financial-inclusion-in-sadc.pdf>
- Financial Sector Deepening (FSD) Kenya. (2016). *2016 FinAccess Household Survey*. Retrieved from <https://fsdkenya.org/publication/finaccess2016/>
- Hughes, N., & Lonie, S. (2007). M-PESA? Mobile money for the “unbanked” turning cellphones into 24-hour tellers in Kenya. *Innovations: Technology, Governance, Globalization*, 2(1–2), 63-81.
- IOS Press. (2012). Ensuring financial inclusion via mobile money. *Journal of E- Governance*, 35(35), 71–76. [Http://Doi.Org/10.3233/GOV.2012.0296](http://doi.org/10.3233/GOV.2012.0296)
- Islam, T., & Kabir, S. (2015). *E-Governance and urban policy design in developing countries*. Retrieved from <https://unhabitat.org/wp-content/uploads/2015/07/E-Governance-and-urban-policy-design-eMail.pdf>

- King, M. (2014). *Enabling globalization: A conceptual framework for financial inclusion and recent evidence for sub-Saharan Africa*. Dublin: Palgrave Macmillan.
- King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108(3), 717–737.
- Koyo, O. C. (2017). *Financial inclusion: Impact of M-Shwari on access to credit among MSE's in Kiambu County*. Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/102911/Koyo_Financial_Inclusion_Impact_Of_M-Shwari_On_Access_To_Credit_Among_MSE'S_In_Kiambu_County.pdf?sequence=1&isAllowed=y
- Leyshon, A., & Thrift, N. (1993). The restructuring of the UK financial services in the 1990s. *Journal of Rural Studies*, 9, 223-241. [http://dx.doi.org/10.1016/0743-0167\(93\)90068-U](http://dx.doi.org/10.1016/0743-0167(93)90068-U)
- Lotto, J. (2018). Examination of the status of financial inclusion and its determinants in Tanzania. *Sustainability*, 10, 2783. <http://doi.org/10.3390/su10082873>
- Mahendra, S. (2006). Financial inclusion? Issues challenges. *Economic and Political Weekly*, 41(41), 4310–4313.
- Mbiti, I., & Weil, D. N. (2011). *Mobile banking: The impact of M-Pesa in Kenya*. Nairobi: National Bureau Of Economic Research.
- McKinnon, R.I. (1973). *Money and capital in economic development*. Washington DC: The Brookings Institution.
- Merton, R. C. (1977). An analytic derivation of the cost of an application of modern option pricing theory. *Journal of Banking and Finance*, 1(1), 3–11.
- Mirzoyants-McKnight, A., & Attfield, W. (2015). Value-added financial services in Kenya: M-Shwari: Findings from the Nationally Representative FII Tracker Survey in Kenya (Wave 1) and a follow-up telephone survey with M-Shwari users. Retrieved from <http://finclusion.org/uploads/file/reports/FII-Kenya-M-Shwari-Report.pdf?cv=1>
- Mndolwa, F. D. (2017). *Determinants in gender disparities in financial inclusion: Insights from Tanzania*. Retrieved from <https://open.uct.ac.za/handle/11427/27332>

- Mugenda, O.M., & Mugenda, A.G. (1999). *Research methods: Quantitative and qualitative approaches*. Nairobi: Acts Press.
- Ndungu, N. (2010). *The future of financial service delivery in Kenya*. BIS Review. Retrieved from <https://www.bis.org/review/r110512h.pdf>
- Njuguna, N. (2014). *Increasing the level of financial inclusion in Kenya*. Retrieved from <https://www.bis.org/review/r140516b.htm>
- Nyagah, C. N. (2013). *Non-financial constraints hindering the growth of SME's in Kenya: The case of plastic manufacturing companies in Industrial Area in Nairobi Kenya*. Retrieved from <https://ir-library.ku.ac.ke/bitstream/handle/123456789/7142/CalebNyaga.pdf;sequence=1>
- Olela, O. L., & Nzioki, P. M. (2016). Assessing the effects of M-Shwari on financial inclusion among Muhoroni factory sugarcane out-growers' households in Muhoroni sub-county, Kenya. *Research Journal of Finance and Accounting*, 7(13), 82–92.
- Ondiege, P. (2010). Mobile banking in Africa: Taking the bank to the people. *Africa Economic Brief*, 1(8). Retrieved from https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/John%20brief%201_John%20brief%201.pdf
- Oyier, J. (2015). *How access to financial services influences how Kenyans use their disposable income: A case study of M-Pesa*. Masters thesis, WITS University, Johannesburg. Retrieved from <http://wiredspace.wits.ac.za/bitstream/handle/10539/19432/Oyier,%20Jill%20-%20474189%20-%20MA%20Research%20Report%20-%20Final.pdf?sequence=2&isAllowed=y>
- Patrick, H. T. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change*, 14, 174-189.
- Safaricom. (2017). *Safaricom Annual Report and Financial Statements 2017*. Retrieved from https://www.safaricom.co.ke/images/Downloads/Resources_Downloads/Safaricom_2017_Annual_Report.pdf

- Schroeder, L., Sjoquist, D., & Stephan, P. (2016). *Understanding regression analysis: An introductory guide (quantitative applications in the Social Sciences)*. Los Angeles, CA: SAGE.
- Schumpeter, J. A. (1911). *The theory of economic development*. Cambridge, MA: Harvard University Press.
- Schumpeter, J.A. (1934). *The theory of economic development: An inquiry into profits, capital, credits, interest, and the business cycle*. Piscataway, NJ: Transaction Publishers.
- Shaw, E. (1973). *Financial deepening in economic development*. New York: Oxford University Press.
- Singh, R., & Roy, S. (2015). Financial inclusion: A critical assessment of its concepts and measurement. *Asian Journal Of Research In Business Economics And Management*, 5(1), 12. [Http://Doi.Org/10.5958/2249-7307.2015.00002.X](http://doi.org/10.5958/2249-7307.2015.00002.X)
- Suri, T., Jack, W., & Stoker, T. M. (2012). Documenting the birth of a financial economy. *Proceedings of the National Academy Of Sciences*, 109(26), 10257–10262. [Http://Doi.Org/10.1073/Pnas.1115843109](http://doi.org/10.1073/Pnas.1115843109)

APPENDIX 1
QUESTIONNAIRE

PART A: BACKGROUND INFORMATION

1. What is your gender?

Male Female

2. Where do you live?

Urban/Town Rural

3. In which of the following age brackets do you belong?

Below 20 years 21-30 years

31-40 years 41-50 years

Above 50 years

4. What is your education level (state the highest level?)

No formal education Primary

Secondary Higher

Other

5. Are you employed?

Employed Self-Employed

Unemployed

6. What is your monthly income?

0 – 10,000 Kshs

11,000-50,000 Kshs

51,000 – 100,000 Kshs

101,000 and above

7. Do you have dependants?

1

2

3 & Above

No

8. How often do you use M-Shwari?

Daily

Once every 7 days

Once every 30 days

Once every 90 days

Other

Never

9. Apart from M-Shwari do you have an account/relationship with any other institution?

Bank

MFI

SACCO

Chama

Other

PART B: DEPOSITS

1. Do you make deposits into M-Shwari?

Yes

No

2. If yes, how often do you make deposits into M-Shwari?

Weekly

Monthly

Quarterly Other

3. Approximately how much have you deposited over the last six months?

0 -10,000 Kshs 11,000 – 50,000Kshs

51,000 – 100,000 Kshs Above 100,000 Kshs

4. Have your deposits increased over the past six months?

Yes No

5. If yes, by how much?

0 -10,000 Kshs 11,000 – 50,000Kshs

51,000 – 100,000 Kshs Above 100,000 Kshs

6. How long do deposits sit in your account before withdrawal?

A Week A Month

Three Months Six Months

A Year Over a Year

7. Why do you deposit money into M-Shwari?

Increase loan limit Cover for Up/Downs in Cashflow

Savings Cover daily expenses

Precautionary measure Pay School Fees/ Medical Expenses

Business Savings/Investment

8. Where else do you deposit your money

Bank

MFI

SACCO

Chama

Hiding Place

Other

9. Approximately what percentage of your money is deposited with M-Shwari?

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10. Why do you prefer to deposit with M-Shwari?

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PART C: LOANS

1. Have you ever borrowed from M-Shwari?

Yes

No

2. If yes, how often do you borrow M-Shwari?

Weekly

Monthly

Quarterly

Other

3. Approximately how much have you borrowed over the last six months?

0 -10,000 Kshs

11,000 – 50,000Kshs

51,000 – 100,000 Kshs

Above 100,000 Kshs

4. Has your loan limit in the past six months?

Yes No

5. If yes, by how much?

0 -10,000 Kshs 11,000 – 50,000Kshs

51,000 – 100,000 Kshs Above 100,000 Kshs

6. What do you primarily use money borrowed M-Shwari for?

Cover for Up/Downs in cash flow Cover daily expenses

Pay for school fees/medical expenses Emergencies

Business Expenses/Investment

7. Where else have you borrowed money from in the last six months?

Bank MFI

SACCO Chama

Family & Friends Other

8. How long on average do you take to repay your M-Shwari loan in full?

30 days 31-60 days

61 – 90 days Over 90 days

9. Have you been listed on the Credit Reference Bureau for failure to repay an

M-Shwari loan?

Yes

No

10. Why do you prefer to borrow from M-Shwari?

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PART D: FEEDBACK

1. What do you consider positive about M-Shwari?

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2. What disadvantages have there been in your experience with M-Shwari?

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3. What improvements should be made to make M-Shwari an even better product?

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4. In a few words, tell us the impact M-Shwari has had on you and/or your family/business

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