EFFECT OF FINANCIAL INNOVATIONS ON FINANCIAL INCLUSION: A CASE OF SMALL AND MEDIUM ENTERPRISES IN URBAN INFORMAL SETTLEMENTS IN NAIROBI COUNTY, KENYA

BY
MUSA BARASA OMAR
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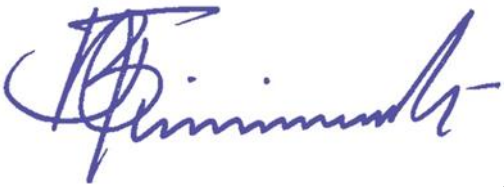
DECLARATION

This research project is my original work and has not been presented for a degree in any other university.

Signed: **Date: 18/11/2022**

MUSA BARASA OMAR

This research project has been submitted for examination with my approval as a university supervisor.



Signed: **Date: 18/11/2022**

DR. JOHNBOSCO M. KISIMBII, PhD

Lecturer, Department of Finance and Accounting

Faculty of Business& Management Science

The University of Nairobi

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I must start by expressing my gratitude to my parents for their unwavering love and guidance. I appreciate you both for giving me the will to aim high and follow my dreams. My gratitude also goes out to my sisters and brothers

I would like to thank my supervisor Dr. JohnBosco Kisimbii, his guidance and advice carried me throughout the project.

Finally, I acknowledge my friends for their support and patience over my several crises. My life is made great over your encouragement.

DEDICATION

This project is dedicated to my parents for their endless love, support and encouragement

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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
IMF	International Monetary Fund
KAM	Kenya Association of Manufacturers
KNBS	Kenya National Bureau of Statistics
OECD	Organization for Economic Co-operation and Development
TAM	Technology Acceptance Model
SME	Small and Medium Enterprises

ABSTRACT

In a global environment in which access to financial services and high-speed internet is neither affordable nor universal, Fintech has the ability to improve financial access, thereby promoting financial inclusion. With the potential of Fintech to increase financial inclusion, there still exists a mismatch between consumer perceptions regarding Fintech's potential especially in improving financial inclusion among SME's in urban informal Settlements in Kenya. The objective of the research was determining the effect of Fintech on financial inclusion among SME's in urban informal settlements in Nairobi, Kenya. Specifically, it was to determine how selected financial innovations affect financial inclusion among SMEs in urban informal settlements in Nairobi, Kenya. This research project was based on the TAM and the diffusion of innovation theory. A descriptive design was applied in the investigation. The total population was 4,678 SMEs in urban informal settlements in Nairobi where a sample of 150 SME's was selected using stratified sampling based on industry sub-sector. Data was obtained from 112 of the 150 which was equal to a 74.6% response rate. To accomplish the set objectives, primary data was obtained using questionnaires that were distributed using drop and pick later method and emails via method and using Google forms. The data collected was converted into quantitative form and subsequently analyzed using SPSS. The results of the data analysis were the generation of descriptive and inferential statistics such as frequencies, percentages, and correlation statistics. A linear regression was used to model the relationship between the variables. From the inferential statistics. Findings showed that SMEs in urban informal settlements in Nairobi extensively use financial innovations. This was established through the regression coefficients which showed that Mobile banking (β=0.316, p=0.000), Agency Banking (β=0.405, p=0.000), Online Banking (β=0.292, p=0.000) and Mobile loan App services (β=0.342, p=0.000) had a positive correlation with financial inclusion. The findings established that financial innovations have a material positive effect on financial inclusion. The model generated an R Square value of 0.312 which means 31.2% of changes in financial inclusion can be explained by changes in the innovations and 69.8% by factors outside the study's scope. These findings were also confirmed through the regression and correlation results which yielded a positive notable relation between financial innovation and financial inclusion. The study recommends SMEs in Urban informal settlements to be more vibrant in adopting the financial technology available as this would boost their firm performance since it will allow them to access financial services easily hence being more financially included. To achieve this, there is a need for policymakers establish policies that facilitate SMEs in Urban informal settlements to obtain mobile credit from providers at low cost.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In a global market in which access to financial services and high-speed internet is neither affordable nor universal, Fintech has the ability to increase access to finance, thereby promoting financial inclusion (World Bank, 2021). Financial inclusion can be viewed from three perspectives; that is in terms of access, usability, and quality of services it provides. Fintech also has the potential to reduce costs to reduce costs while increasing the speed and access thereby providing opportunities for more tailored financial services promoting financial inclusion (Appaya, 2021). In the past 10 years, approximately 1.2 billion unbanked people gained had access to financial services, lowering the number of previously unbanked people by 35%. This was achieved by increasing the number of mobile money accounts. While approximately 1.7 people are still unbanked, fintech has brought money closer to many people. With the potential of Fintech to increase financial inclusion, there still exists a mismatch between consumer perceptions regarding Fintech's potential, and financial sector representatives even though this is expected to change in the future (Appaya, 2021). FinTech is expected to contribute significantly to financial inclusion and deepening. This will be achieved by improving the efficiency level of the financial sector since it provides opportunities to increase access to advanced technology which is useful in overcoming information barriers and lowering cross-border transfer costs (World Bank, 2021).

This project will primarily be anchored on the diffusion of innovation theory and the Technology Acceptance (TAM) model. The diffusion of innovation theory (Rogers, 1962) explains the rate of spread of a product, service, or process through a social system. It explains how well consumers are likely to approve a new product or idea. Rogers (2003) argued that the perceived attributes of an innovation are a significant determinant of its adoption. The theory will be useful to this study as it will attempt to highlight the perceived attributes of Fintech in the process of financial inclusion while at the same time highlight the barriers to its adoption. The second anchor theory that will be useful in the study is the TAM model which is an information systems theory that explores how users of technology accept and begin to utilize technology (Davies, 1989). According to the theory, there are two key characteristics of an innovation that determine its usability. These are its perceived ease of use and its perceived usefulness. The model

is useful in explaining the adoption of Fintech as a new financial innovation that is integral to the process of financial inclusion. Fintech can support financial inclusion based on its perceived ease of use and usefulness.

In Kenya it is estimated that 33% of Kenyans within the urban regions and 50% of those in rural areas are living below the poverty line (KNBS, 2013). It is also estimated that close to between 60% to 80% of all residents in urban areas live in informal settlements (Amendah et al., 2014). Nairobi, the capital of Kenya records the highest growth rate in comparison to other cities in Africa. Of this population, 75% live in informal settlements. In terms of land area, the Informal settlements in the city occupy at least 5% of the entire city and have of the city's population live within these areas (Cruz et al., 2005). Nairobi alone employs approximately 25% of the country's population and out of these, 43% of them are urban-area settlers. The capital is responsible for generating about 45% of the nation's GDP and is therefore a significant economic hub. These informal urban settlements have a myriad of social-economic challenges for example diseases, crime, unemployment, and poverty. Fintech has been cited as a primary financial inclusion enabler in Sub-Saharan Africa. In-spite of this, Fintech development in informal settlements remains a key barrier to access to capital for most SMEs and low-income earners in informal urban settlements. It is from this observation that this study will be conducted to examine the effect of financial innovations in financial inclusion in urban informal settlements in Nairobi, Kenya. Specifically, this study targets SME's in urban informal settlements in Nairobi, Kenya

1.1.1 Financial Innovations

Fintech is broadly known as the "the utilization of technology to provide financial solutions" (Arner et al., 2016). According to Dorfleitner et al. (2016), there exists no universally accepted definition of the term. The term 'Fintech' has undergone an evolution and is no longer used to describe financial services that utilize technology but is presently an industry. Zavolokina, Dolata and Schwabe (2016) argue that Fintech has three main features: input (technology, money and organization), and processes (change, disruption, application of IT in finance, and creation of competition) that result in an output (new processes, products, services or models). Based on these definitions, Fintech can hence be referred to as the integration of technology and new models that alter, distort or improve financial products and services.

Fintech has different meanings to different users, and its meaning varies according to context. As an example of disruptive technology, the product's identity, or service it provides depends on the market which it serves. For developed markets Fintech looks and serves differently from Fintech that serves developing markets like Kenya, where financial needs of the majority are more basic, but significantly prominent (Rabobank, 2018). The rewriting of rules outlining the interaction of users and their finances in developing countries, is motivated by the dissatisfaction of consumers who cannot efficiently participate in formal financial systems and specifically those who reside in rural areas and urban informal settlements (McKinsey, 2016). The role of Fintech in such areas is to provide opportunities for the population that is excluded to use financial products and services (Gabor & Brooks, 2016). This shows that Fintech plays a major role in the creation of a more inclusive financial ecosystem in Kenya, specifically by increasing the availability of credit availability and payment mechanisms to middle and low-income earners.

1.1.2 Financial Inclusion

The World Bank (2017) notes that financial inclusion can be understood as the process through which individuals and companies obtain access to reliable and low-cost financial products or services capable of meeting their needs when it comes to making transactions, payments and credit access. Access to credit becomes required to meet the financial needs of enterprises, including transactional, bill payment, and savings, and it should be done in a fair manner (World Bank, 2017). Financial inclusion, according to Nandru et al., (2016), is the manner in which credit is availed to businesses in need, specifically those that do not make deposits in financial institutions. State organizations with the goal of increasing their economies must establish financial inclusion policies that nurture lower-income enterprises that can contribute to economic growth (Thankom & Rajalaxmi, 2015).

Mutegi and Phelister (2013), found that many people who had reached adulthood were unable to support their everyday operations due to financial policies that excluded them and prevented them from accessing financial services. According to the World Bank (2017), all countries should strive to achieve financial inclusion for both businesses and individuals to achieve economic stability and progress. It is reasonable to consider that more savings by underbanked adults in financial institutions could enhance the global economy (World Bank, 2014). Financial services should be made available to low-income earners, unbanked groups, and disadvantaged people at a reasonable

cost. This is seen as a strategy to improve financial inclusion and economic development (Allan, Massu, & Svarer, 2012; DemirgüçKunt & Klapper, 2012). On the same note, financial inclusion can potentially be boosted among Sub-Saharan countries through mobile money (Global Findex Database, 2017).

Since 2014, there has been a growth in the number of adults with an account in the region who have been constantly migrating their accounts from financial institutions to mobile money accounts at a rate that has nearly doubled in the previous three years, with a huge percentage of adults having only one mobile money account (World Bank, 2014). It has also been established that individuals who hold mobile money accounts in Africa's emerging countries lessen poverty. In Kenya, M-pesa accounts and internet banking are used by 88 percent of account holders in, and opportunities are sure to boost account ownership (GFD, 2017). Since 2006, Kenya's financial inclusion landscape has changed dramatically. According to Fin Access 2019, there has been a drop-in transition in the following aspects: rural to urban areas and vice versa, rich and poor people, as well as males and women. All of these discrepancies were brought to light by the expansion of ICT, government backing and initiative, as well as mobile money use.

Governments and digital IT expanded adoption is required to consider the underprivileged group by deepening financial service usage by enabling these groups to obtain financial services, particularly in rural areas, as evidenced by research (GPFI, 2012). Financial services should be made availed closer to the people, should be cost-friendly, adequate, and accessible to underserved sections in society while adhering to minimal consumer protection criteria through the use of financial technology.

1.1.3 Financial Innovations and Financial Inclusion

Financial innovation has primarily been considered as the evolution of new financial services tools as well as new efficient methods in the provision of financial services (Misati et al, 2010). Financial inclusion in turn refers to the ability to access and utilize financial services in an affordable way. According to the Access through Innovation Subgroup (ATISG) financial innovation has become an optimal way to improve financial service access. According to the organization, the emergence of financial innovations through technology will be a long-lasting solution that will be useful in expanding access to financing (ATISG Report, 2010).

There are a number of notable financial innovations such as mobile money transfer, internet banking, and credit and debit card payment mechanisms. The emergence of these innovations has significantly increased the financial inclusion levels especially in developing nations. An example can be taken of mobile money which has enabled many people access and transfer money. Through other innovations such as agency banking, the rural population who traditionally could not access formal financial institutions, now are able to access financial services through the innovation.

Andrianaivo and Kpodar (2011), in a study on mobile phone development and economic growth in Sub-Saharan Africa, found that the presence of mobile phones had a consolidating impact on financial inclusion, a study done between 1988 and 2007. Similarly, Kama and Adigun (2013) while examining financial inclusion in Nigeria established that financial inclusion was a key development policy among many developing nations. In the study they established that low financial inclusion was attributed to inadequate infrastructure and inefficient technology adopted by financial institutions. Other empirical evidence from various studies show that unrestricted access to savings bank accounts, or informal savings accounts have a positive impact on productivity, consumption and income, while reducing exposure unanticipated events (Dupas and Robisson, 2009)

1.1.4 SMEs in Kenya

Small and Medium Enterprises (SMEs) can be simply defined as enterprises with few employees (Rijkers, Arouri, Freund, & Nucifora, 2014). These types of enterprises normally have 5 to 50 for small enterprises and between 50 and 100 for medium enterprises. In spite of their small size, their motivation is the same which is to make a profit. Since their main objective is to make a profit, improved financial performance is an integral goal for these types of firms. The performance of such enterprises can be ascertained in a number of ways such as revenue expansion, lowered costs and lowered cost of capital (Collard, 2010). To achieve enhanced performance, SMEs need to have access to capital, which is available in form of loanable funds (Archer, 2019).

SMEs are critical in an emerging economy like Kenya. This is because they cumulatively account for 18% of Kenya's GDP and create employment for approximately 80% of the country's population (Kithae et al., 2012). Regrettably, 70% of these enterprises do not survive for more than three years due to operational challenges such as lack of sufficient financing (Douglas, Muturi, & Ochieng, 2017). Abala (2013) in a study conducted in Kenya's informal settlements established

that approximately 84.7% of SME's in urban informal settlements cite the lack of financing as a key challenge facing them. All this happens while statistics from the Kenya Credit Bureaus shows a high rate of adoption of mobile loans by Kenyans (Approximately 19 million) since 2019. As such the extent to which mobile financing has been leveraged to counter the challenge of access to conventional bank loans by SMEs is still unexplored.

1.2 Research Problem

Financial inclusion is a key factor among Small and Medium Enterprises because policy formulators consider it an economic ingredient in the alleviation of poverty and in promoting sustainable growth. Faced with greater challenges compared with larger and more complex firms, Word bank (2014), the role of SMEs has been recognized in the achievement of the big four agendas as outlined in Kenya's vision 2030. It has been recognized as one of the primary drivers of the development that seeks to transform the country from a developing country to a developed middle-income country, by providing standard life to Kenyans by 2030 (KNBS, 2015; CBK, 2016). As a roadmap to achieve this goal, the Kenya Association of Manufacturers in collaboration with the Kenyan Government outlined several reforms to this sector. Some of these include creating a conducive climate for SMEs entrepreneurs thereby securing the future of these businesses. KAM is tasked with providing strategic leadership through setting long term goals on how to enable financial inclusion among SMEs. (KAM, 2019; GOK, 2018).

In spite of the increase in Fintech development, a number of SMEs still face financial exclusion challenges (KNBS, 2019). Access to external financing by SMEs is difficult and costly while their access to finance has significantly declined. The restrictions on financing that SME's face hamper their investment opportunities stagnating their growth (Irwin & Scott, 2010). According to George, Namusonge, and Waiganjo (2017), in a study on the effects of SMEs access to finance on performance in Mombasa, Kenya, sought to establish a link between SMEs performance and financial Challenges from the study, they established that, indeed financial challenges, mainly limited access to financing has a significant impact on their performance. A research by the World Bank on the services availed by individuals and companies on financial inclusion in Africa, noted that African nations still lag behind in growth (World Bank, 2008). In a study on the effect of micro financial institutions effects within the SMEs sector, Priscilla, Ombongi, & Wei, (2018) found that micro financial institutions have a positive impact on SME performance. These studies

however failed to establish empirical evidence on financial technology and financial inclusion among Kenyan SMEs, resulting in an empirical gap which will be the subject of the current study. The study hence sought to determine the effect of financial innovations on financial inclusion: opportunities and barriers. The study specifically analyzed SMEs in urban informal settlements in Nairobi, Kenya

1.3 Research objectives

The objective of the research was to determine the effect of financial innovations on financial inclusion among SMEs in urban informal settlements in Nairobi, Kenya

1.3.1 Specific Objectives

1. Determining the effect of agency banking on financial inclusion of SMEs in Urban Informal Settlements in Nairobi.

2. Determining the effect of mobile banking on financial inclusion of SMEs in Urban Informal Settlements in Nairobi.

3. Determining the effect of online banking on financial inclusion of SMEs in Urban Informal Settlements in Nairobi.

4. Determining the effect of Mobile App lending services on financial inclusion of SMEs in Urban Informal Settlements in Nairobi.

1.4 Value of the Study

The stakeholders listed herein are expected to benefit from the findings as well as recommendations of this study as it is tailored to be of use to them; For the Government of Kenya, the study will highlight policy gaps in Fintech adoption by financial institution especially those that significantly affect SMEs sector and thus will motivate the government to address these gaps. The management of SMEs will also benefit from the study as it will address key challenges in obtaining finance and recommend ways in which these institutions can overcome financing challenges. Scholars and other academicians as will benefit from the study as it will highlight future research gaps to be filled by future studies as well as be an addition to literature on Fintech and financial inclusion.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section discusses the key theories supporting the study, as well as empirical data. This chapter contains a literature review on Fintech and financial inclusion. It will also highlight factors determining growth of Fintech companies as well as opportunities and barriers identified from existing literature, the study gaps identified, and a summary of the literature.

2.2 Theoretical Review

2.2.1 Diffusion of Innovation Theory

The theory by Rogers (1983) states that an Innovation is an idea, object or practice recognized as new social system members (Ahlstrom,2010). Diffusion of innovation is the manner in which communication on the innovation is relayed through a number of channels overtime among members in the social system. The theory has attracted a lot of the attention of scholars who continuously make attempts to explain consumer behavior in regard to new technology. The suggestion made is that innovation diffusion is achieved when the society accepts and utilizes an idea or technology (Ahlstrom, 2010). The theory proposes that there are four key elements in adoption which include: innovation, communication channels, time and social system.

Rogers (2003) defined it as an idea, practice or project considered new by an individual or society regardless of the period in which the invention took place. Communication refers to the process by which two or more parties engage in the exchange of facts in search of a common ground. This process normally takes place through conduits between terminals. A channel on the other hand is the channel in which messages are transferred from the message generator to its recipient. The theory also considers time as an element in the diffusion process (Rogers, 2003). The diffusion of innovation process and rate of adoptions have a time element in which it occurs. The social system is the set of linked units used to find a common resolution to a problem in order to accomplish a common aim. Further the theory states that five stages are in the innovation diffusion process that include the knowledge, persuasion, decision, the implementation and confirmation stages (Rogers, 2003).

This theory is critical to this study since it outlines the way in which the spread of a new idea occurs. The spread of innovation hence occurs when people become aware of it and are convinced that it is good, are persuaded to adopt it and other people show acceptance to it. An innovation is therefore spread if it becomes known by people, the people are convinced that it is desirable, they make the decision to adopt it together with other people in the social system. A failure in any of the stages will prevent the spread of the innovation.

2.2.2 Technology Acceptance Model

Proposed by Davies in 1989, this model was developed anticipate the adoption of information technology in an organization as well as user acceptance of it. The goal of the Technology Acceptance Model is to use specific services or technology to explain attitudes (Bertrand & Bouchard, 2018). Various meta-analyses have shown that the Technology Acceptance Model is a potent, strong, and valid model. With regard to the acceptance of technology, TAM is the most common model. In addition to this, the Technology Acceptance Model is accompanied by external variables to explain dynamism in the supposed ease of use and utility (Marangunic & Granic, 2015).

The main variables of the TAM theory were also linked to enabling events, subjective norms, and convictions (Schepers & Wetzels, 2007). These factors, which vary among investigations, present personal capacities (Adams, Nelson, & Todd, 2016). As a result, how much work a person thinks it takes to use technology is what actually encompasses perceived ease of use. The behavior intention predicts use in various variants of the Technology Acceptance Model (Scherer, Siddiq, & Teo, 2015). The direction of this relationship is not deterministic because pleasant user experience can influence future behavioral intentions (Straub, 2019). This model determines how people use technology based on their perceptions of its utility, ease of use, and level of acceptance (Ndubisi, Jantan, & Richardson, 2014). In this study, anticipate client acknowledgement was employed, and it was chosen based on perceived usefulness and utility. Given available fintech, it predicts consumer attitudes and behavior intentions toward using financial services. Even though financial technology has advanced, elements such as adequacy, accessibility, affordability, and awareness are still lacking in the Kenyan market, preventing them from being completely financially engaged.

2.3 Financial Innovation Determinants

2.3.1 Agency Banking

Agency banking can be defined as the delivery of financial services that occurs outside conventional banking institutions and is done by non-bank retail outlets which utilize technologies for example point-of sale (POS) devices or mobile phones for real time transaction processing (Modupe,2010). Across the globe, many retailers are increasingly utilizing agency banking services to deliver financial services to clients located far from banking institutions. A study by Waihenya (2014) in Kenya on the relation between agency banking and financial inclusion. Established that it is the most popular banking service adopted in Kenya's rural areas which are characterized by poor infrastructure and long distances to nearest financial institutions. In the study it was found to be the most common method of accessing financial institutions hence aiding in financial inclusion.

2.3.2 Mobile Banking

Mobile banking is a type of banking service that allows customers to transfer money, save money and make payments using their mobile phones. It is a mobile-based microfinance, lending and remittance service allowing individuals to access funds through a network of agents. For this service to be enabled, there should be a link between an individuals' bank account ad his or her mobile device (Mbiti & Weil, 2014). A study in Kenya by, Antoine and Leo (2017), on mobile money and financial inclusion established that most of the poor, uneducated and low-income groups derive massive benefits from mobile banking because they are able to obtain faster and more frequent transactions. Another study in Kitui county Kenya by Joseph (2018), established that mobile money technology has a profound impact on financial inclusion in the country. The recommendations from this study were that policymakers should consider mobile technologies when formulating financial inclusion policies. Similar results were posted by Wamuyu (2014), who established that M-Pesa technology significantly impacts financial inclusion within Kenya.

2.3.3 Online banking

Online banking is a type of banking service that allows individuals to transact over the internet. Such services allow individuals to remit their insurance premiums, settle their bills, buy goods, and seek credit facilities. Donner and Escobari (2018) noted that online transactions have a significant impact on corporate growth. A study conducted by the CBK in 2015, established that

online banking surpassed all forms of electronic payments such as use of ATM cards in Kenya. The study also established that the number of customers using online banking services had significantly increased during the period. A study by DemirgüçKunt et al. (2015) cited Kenya as the Sub-Saharan Africa leader in the number of online Kenya is the leader in online banking. From the findings, Kenyans a majority of the population in Kenya who use such services surpasses the number of users in other nations in the region. This places Kenya at the epicenter of financial innovations in Sub-Saharan Africa.

2.3.4 Mobile App Lending Services

A majority of digital lending applications are provided through the google pay store services portal. These financial digital apps provide financial planning tools, free inquiries, and financial advice through mobile apps available in the platform. Additionally, they provide credit facilities to individuals and small businesses as needed through mobile phones (Beck, Demirgüç-Kunt, & Levine, 2016). According to Mlady (2016), these technology-based lenders have made a significant progress towards the lowering of cost of credit thereby enabling more low-income customers access credit facilities. A study by Edward, Delbridge, and Munday (2011), on the impact of innovation on SMEs' financial performance established that innovation notably impacts performance of SME's. They established that the mobile lending apps have significantly bridged the financial inclusion gap and improved access to financial services by low income earners. Mlady in a stud of the digital apps however noted that there exists significant customer protection issues emerging from the use of digital lending apps.

2.4 Empirical Review

Financial inclusion means having access to and effective use of financial services. Fintech allows easy access to financial services thereby reducing income inequalities and poverty. A global empirical study by Beck et al (2015) revealed that countries with a sound financial development, experience reduced income inequalities and a reduction of the number of people living on less than $1 a day. Similarly, a study by Swamy (2015) revealed that providing access to finance to the poor using Fintech is considered a pre-requisite for poverty reduction, inclusive growth and growth of entrepreneurial opportunities. A study on Fintech for SME's by Nemoto &Yoshimo (2019) for the Asian Development Bank noted that the Asia SME credit gap is very wide. Individual SMEs tend to be smaller in size and disclose little information. Because of this, conventional banking

institutions regard them as risky institutions thus lending them funds at higher interest rates. These institutions do not also have sufficient collateral, thus SMEs tend to be less liquid. However new technology involves use of distributed ledger technology, cloud computing, and artificial intelligence, have begun to enable quicker, convenient and less costly financial services. Innovations in digital technology is enabling SMEs to gain access to improved financial services. this study was conducted in the Asian market and therefore its findings cannot be generalized in the Kenyan market

A collaborative study between the OECD and the Asian Development Bank (ADB) established that small businesses in Asia are significantly lagging behind their global peers in obtaining financial services, particularly credit. It was noted that these businesses compared to their global peers have not made significant investments and are more likely to utilize their retained earnings compared to external forms of financing. Their hesitance towards borrowing is mostly attributed to restrictive bank requirements Such as collateral to provide security for financing. In spite of this, emerging innovations in Fintech and in conventional business models are expected to take advantage of the rapid expansion of Asia's digital economy and this presents an opportunity for expansion of the Fintech sector in Asia.

Regionally, Oshora (2021), examined the role of Fintech on financial inclusion in Ethiopia: opportunites and barriers using the Global Findex survey data for 2014 to 2017. From this study, it was noted that even though there was a double digit growth in account ownership during the period, the largest share of the population (65%) in the country does not have access to accounts. It was noted that women, less educated, youth and poor adults were less likely to own accounts. Among the barriers to financial inclusion, lack of money and absence of necessary documentation were the key barriers to innovation of Fintech as a financial inclusion mechanism. The study was done in Ethiopia hence its findings cannot be applied within the Kenyan context.

Kendall et al., (2011) argued that for low-earning clients, there is still a need for high speed engagement at point-of-sale, and digital financial services can still be vulnerable and fail to perform if these changes are not provided. For continued use of mobile accounts, client trust is essential in ensuring adequate uptake and continued utilization of mobile bank accounts. The failure of mobile transfer services to protect consumers from loss of money in the event of client

mistakes in sending and receiving money such as misspelt names of recipients may cause mistrust of the mobile money system by the consumers.

Sahay et al. (2020) in an empirical study of determining the effect of Fintech on financial inclusion, noted that Fintech has the ability to provide less costly, efficient and collateral-free avenues for individuals and enterprises through the use of mobile money, mobile-point-of-sale services and crowdfunding that assist them in making payments, obtaining credit and supporting their cash management functions. In this study, the authors developed a digital financial inclusion index using digital payment services data obtained from mobile phones the internet, and an additional conventional financial inclusion index for services provided through conventional financial institutions. Using this index, they established that there was a significant increase in financial inclusion in the years prior to the COVID-19 crisis, more specifically in Africa.

The authors further noted that in a total of eight countries in Africa including Zimbabwe, South Africa and Nigeria, improvements in financial inclusion has been entirely has been primarily driven by Fintech. Additionally, Fintech was responsible for closing the existing gender gaps in financial inclusion this was concluded after establishing that the digital financial inclusion gender gaps were lower on average compared to the gaps from conventional gaps. This was established across the data points especially in countries in Africa, the Middle East and Central Asia. Contrary to these findings, the gender gaps in countries found in Asia-Pacific, Latin America and the Caribbean, increased in the wake of digital financial inclusion compared to conventional financial inclusion, demonstrating that continued use of Fintech widened the gender gap in these regions.

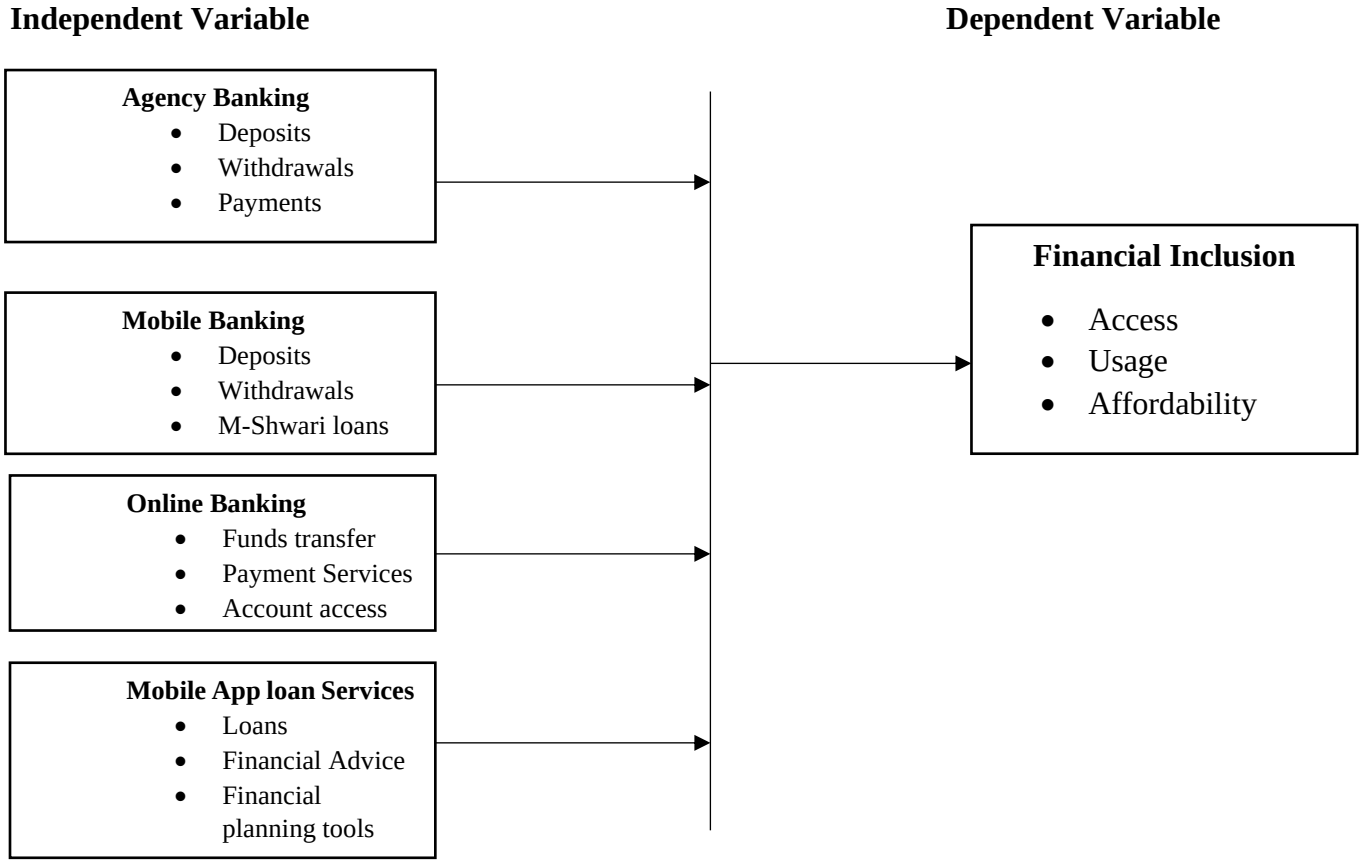
Chen et al. (2021) in a survey of 28 countries established a persistent "Fintech gender gap" which was a key obstacle in financial inclusion. The gap was significantly smaller among products complementing conventional banking services relative to newer products that acted as substitutes. The study also established that more women had a tendency to embrace digital innovations complementing familiar services. The study concluded that the gap in Fintech adoption was primarily based on variations in attitudes towards technology and price. In the study, it was also established that security of digital innovations was a primary concern especially among female consumers.

Tiwari, Schaub & Sultana (2019), conducted a study on barriers to 'last mile" financial inclusion in Northern Kenya. This study was conducted to assess the BOMA Project (BOMA) whose main

goal is to support women at the "last mile" of financial inclusion, especially those living in remote, rural areas, where delivery of financial services is complex and expensive. In this study, it was established that even though financial innovations brought services closer to the people, there were existing barriers to adoption of Fintech in remote areas. Factors such as low levels of literacy, numeracy, and familiarity with mobile technology were significant constraints to the use of financial innovations and thus were a barrier to financial inclusion in rural Kenya. For those that embraced the innovations, they recorded substantial increases in household decision-making power, and education and nutrition expenditure. The study was done in rural Kenya which has different socioeconomic challenges from those within urban settings like Nairobi and hence its findings cannot be applied within Nairobi.

2.5 Conceptual Framework

In determining the effect of Fintech on financial inclusion, The predictor (independent) variable for the study will be Financial innovations indicated by Agency banking, Mobile Banking, Online banking and Mobile App lending services whereas the response (dependent) variables will be financial inclusion indicated by Access, Usage and Affordability.



2.7 Summary of Literature Review

This chapter discussed the literature on the study topic which included the theoretical and empirical studies on Fintech and financial inclusion. The study highlights two key theories which are the diffusion of innovation theory and TAM model. From the empirical study, most confirm that overall Fintech, promotes financial inclusion. The studies reviewed have shown the existence of a conceptual gap in determining the effect of Fintech plays on financial among SME's in urban informal settlements in Nairobi which justifies the need for further examination.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section entails the designs of study, the methods used to collect data and the process of analyzing the data. The methodology shows how the entire study was done, organized and the individuals involved in the research to offer the required information and how it was collected. All this was done to compile useful findings.

3.2 Research Design

This study utilized the descriptive design to determine how the variables relate. A descriptive design. It involves establishing the actual nature of the phenomenon being studied. The primary advantage of this research design is that it does not involve manipulation of variables, rather it observes the phenomenon as it is.

3.3 Population of the study

The study's intended population was all the SMEs operating within urban informal settlements licensed at the Nairobi city council. Data on the population was obtained from the county's Licensing department which shows that there are 4,678, licensed businesses from the area (NCC, 2021).

3.4 Sampling Technique and Sample Size

A sapling technique describes the procedure to be applied in the selection of the representative unit of the population (Brase & Brase, 2016). The study selected a sample from the 4,678 SME's located in Nairobi County using a stratified sampling technique. The study selected the owner of the SMEs and their representative in each organization. For this, 150 SMEs were selected using stratified random sampling techniques; on the basis of the nature of the business. The various strata was based on the SME sector which included manufacturing, services and trade. From the 150 SMES, 50 were from the trade industry, 50 in the manufacturing industry while 50 were in the services industry.

3.5 Data Collection

This study collected primary data. The researcher utilized closed-ended questionnaires to collect primary data from the respondents who included the business owners or their representative in the SMEs. Structured questionnaires, was the source of primary data. The questionnaires had closed ended questions that had a 5 point t-scale where the research participants were required to fill

according to their level of acceptance of the statements. The questionnaires were be sent via Google forms.

3.5.1 Data Validity and Reliability

The study used Cronbach's alpha in testing reliability. Reliability was tested using questionnaires that were duly completed by respondents who were selected randomly. Cronbach's alpha coefficient was be adopted to assess reliability. A figure that's nearer to 1 denoted a higher internal reliability. The recommended coefficient is 0.7. Validity stipulates the extent that a measure measures what it ought to be measuring. It is the ability to produce the accuracy of the results.

3.5.2 Diagnostic Tests

This study tested for normality, linearity, heteroscedasticity, multicollinearity and autocorrelation. Normality tests were conducted to determine if sample data was selected from normally distributed population. The normality of distribution of data can be determined using several methods and fall into two categories: statistical and graphical. According to Smith (2015), normality aids in prediction of scores of response variables and aids in determining the distribution shape. In order to test for normality, this study adopted the Shapiro Wilk test. It is a test that indicates how well a theoretical distribution models the empirical data.

Multicollinearity is a multiple regression model where an independent variable is predicted from analysis of other variables. The study tested for multicollinearity by analyzing the variance inflation factor (VIF) and assessing tolerance (1/VIF). A value of VIF that's more than 3 indicated that the independent variables are collinear.

Homoscedasticity, in a linear regression model, refers to situation where the error term has a normal distribution and has a variance that's constant across all values of the independent variable. The opposite refers to heteroscedasticity, that is where the error term variance is inconstant. A constant regression error (homoscedastic) indicates that the model used is accurate whereas uneven variances would indicate that the sample result is biased.

Linearity is where a response variable depicts a linear relationship with one or more predictor variables. Murshed & Zhang (2016) states that linear relationships can be demonstrated in form of a graph whether the constant and the variable are connected using a straight line. This relationship can also be expressed mathematically where the product of the predictor variable and the slope

coefficient is gotten and added to a constant resulting to the dependent variable. Linearity was tested using ANOVA output table for linear and non-linear components. SPSS version 28 was used to do this. If the results indicate that the deviation from linearity is more than 0.05, the relationship among the independent variables is linearly dependent. If otherwise, then the relationship is not linear.

3.6 Data Analysis

The collected data was coded and processed using SPSS to generate information aided in analysis. The result was presented in table form. Means, percentages, frequencies and standard deviation was used to analyze quantitative data.

3.6.1 Analytical Model

Analysis models help determine the correlation between the variables of the research. The regressed model was utilized in checking the correlation between Fintech and financial inclusion among SME's in urban informal settlements. The relevancy and relationships was determined by multiple regression and correlation analysis techniques where;

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Where;

Y = Financial Inclusion of SMEs

X_1 = Agency Banking

X_2 = Mobile Banking

X3= Online Banking

X_4 = Mobile loan App Services

β_0 = constant of the regression

β_1, β_2, β_3 and β_4 = independent variable coefficients

ε = Residual (error) term

3.6.2 Test of Significance

The study's significance was ascertained at 95% confidence and 5% significance levels. A significance value that is more than the critical value set means that the model is insignificant in modelling the relationship. Otherwise, the model is significant. SPSS was used to execute high-level analysis such as ANOVA, multivariate analysis correlation, multiple regression analysis and chi-square test.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter reports the findings of the study. It will contain a background section which will discuss the demographic details of the study respondents. Additionally, the chapter will report the findings from the descriptive and inferential statistics of the research objectives.

4.2 Response Rate

The response rate is established by comparing the number of completed responses by the number of participants targeted by the study. This rate is also called the completion rate or return rate and is normally given in the form percentages. Table 4.1 illustrates the completion rate for the study.

Table 4.1: Response Rate

Response Rate	Frequency	Percent
Completed	112	74.6
Incomplete	38	25.4
Total	**150**	**100**

From Table 4.1, 135 questionnaires were sent to SME owners and managers in urban informal settlements. From the study outcomes, 112 of the 150 questionnaires issued were correctly filled and returned, which was a 74.6 percent response rate. These findings agree with Kothari (2016), who stated that a study with an above 70% response is adequate for analysis purposes.

4.3 Demographic Characteristics

The first section of the questionnaire obtained data in the general characteristics of the SME's. This included the legal structure of the business, Number of years in operation, sub-sector of and the number of employees.

4.3.1 Legal Structure of SME

Information on the legal structure of the SME's was collected from the respondents. The results are as shown in Table 4.2.

Table 4.2: Legal Structure

Structure	Frequency	Percentage
Sole Ownership	64	57.1
Partnership	32	28.6
Limited Company	5	4.5
Co-operative Society	11	9.8
Total	**112**	**100**

As per Table 4.2 above, sole ownerships made up 57.1 percent, followed by partnerships at 28.6 49.9 percent, Co-operative societies followed at 9.8 percent and last was Limited companies at 4.5 percent. This demonstrates that most of the SME's in urban informal settlements are sole ownerships.

4.3.2 Years in operation

The research wanted to establish the years each enterprise had been in operation. Understanding the number of years in operation is important as it may have an influence on the responses. The findings are in Table 4.3.

Table 4.3: Number of years in operation

No. of Years	Frequency	Percentage
Less than 1 year	32	28.5
2-5 years	54	48.2
6-10 years	20	17.8
Above 10 years	6	5.5
Total	**112**	**100**

Table 4.3 displays that the highest number (48.2%) of the SME's, have been in operation for the last 2 to 5 years, 28.5 percent were less than 1 year, 17.8 percent had been in existence for between 6 and 10 years and lastly 5.5% of them had been in operation for above 10 years. According to the findings, Most of the SME's in urban informal settlements are relatively young businesses. With most of them still in the growing phase, the findings would highlight the role played by Fintech in their growth.

4.3.3 Sub-Sector

The respondents were asked to state the relevant SME sub-sector they were registered under. Table 4.4 outlines the results.

Table 4.4: SME Sub-Sector

Sub-sector	Frequency	Percentage
Trade Sector	44	39.2%
Manufacturing Sector	33	29.5%
Services Sector	35	31.3%
Total	**112**	**100%**

From the respondents gathered, the highest number of SME's in urban informal settlement were actively involved in the trade sector (39.2%) followed closely by the services sector at 31.3 percent and lastly the manufacturing sector at 29.5 percent.

4.3.4 Number of employees

Information on the staffing levels of the SME's was obtained in the study. Table 4.5 shows the findings.

Table 4.5: Number of Employees

Employees	Frequency	Percentage
Less than 5	31	27.6%
5- 10 Staff	54	48.2%
11- 20 Staff	17	15.2%
21-35 Staff	7	6.3%
36-50 Staff	3	2.7%
Total	**112**	**100%**

Results demonstrate that the largest proportion (48.2%) had between 5 and 10 employees, 27.6% had less than 5 employees. 15.2 % had between 11 and 20 employees, between 21 and 35 employees and finally 2.7 % had between 36 and 50 employees. Findings indicated that most of the SME's in urban informal settlements in Nairobi County had approximately less than 10 employees.

4.4 Descriptive Statistics

The following sub-section discusses the descriptive findings base on every variable adopted in the study, and presents them in form of percentages, means and standard deviations.

4.4.1 Agency banking

For agency banking, the standard deviation and mean of the individual attributes of the variable are in Table 4.6 below. The results show that the SME's in urban informal settlements in Nairobi County use agency banking extensively. This is supported by the mean scores of the attributes which were above 4, with a 4.52 mean and a 0.25 Std dev on a 5-point scale.

Table 4.6: Descriptive Statistics for Agency Banking

Statements	N	Mean	Std. Dev
With Agency banking, I can make daily deposits of sales directly to my account thereby avoiding handling too much cash	112	4.62	0.48
Agency banking allows more extended banking hours thereby allowing deposit and withdrawal of funds at the closure of banking hours.	112	4.37	0.47
Agency banking allows me to efficiently pay my employees	112	4.76	0.53
Agency banking has reduced time and costs required to access the enterprise's bank accounts	112	4.41	0.59
Use of Agency banking has reduced my costs of operation	112	4.60	0.49
Agency banking has assisted my business to scale on a higher level while acting as a source of income through agency banking.	112	4.34	0.96
Overall mean Score	**112**	**4.52**	**0.25**

The findings revealed that With Agency banking, the SME owners can make daily deposits of sales directly to their accounts thereby avoiding handling too much cash (Mean=4.62, std. dev=0.48). Furthermore, Agency banking allows more extended banking hours thereby allowing deposit and withdrawal of funds by the SME's at the closure of banking hours (Mean=4.37, std. dev=0.47). Additionally, Agency banking allows the SME's to efficiently pay their employees (Mean= 4.76, std. dev=0.53). It was also revealed that agency banking has reduced the time and costs required to access the enterprise's bank accounts (Mean=4.41, std. dev=0.59). Use of Agency banking has reduced costs of operation for the SME's (Mean=4.60, std. dev=0.49) and that Agency banking has assisted businesses to scale on a higher level while acting as a source of income through agency banking (Mean=4.34, std. dev=0.96). The implication of these scores is that most of the SME's in Urban informal settlements in Nairobi use Agency banking.

4.4.2 Mobile banking

The mean and the standard deviation for the specific mobile banking attributes are in Table 4.7. The results show that the SME's in urban informal settlements in Nairobi County significantly use mobile banking. This is supported by the attributes related to mobile banking mean scores greater than 4, with a 4.56 mean and a 0.27 Std Dev on a 5-point scale.

Table 4.7: Descriptive Statistics for Mobile Banking

Statements	N	Mean	Std. Dev
I am able to save money to my M-shwari account using M-Pesa to raise my loan limit.	112	4.60	0.49
I am aware of Fuliza and I use it during emergencies.	112	4.62	0.58
M-Pesa has enhanced the operational effectiveness of my enterprise.	112	4.44	0.49
I utilize M-pesa to receive payments for services rendered	112	4.53	0.50
I make daily sale deposits through M-Pesa	112	4.48	0.50
I use M-Pesa in settling my suppliers and employees.	112	4.65	0.47
Overall mean Score	**112**	**4.55**	**0.27**

The findings revealed that with mobile banking, the SME owners are able to save money to their M-shwari accounts using M-Pesa thereby increasing their loan limits (Mean=4.60, std. dev=0.49). The findings further revealed that the SME's are aware of Fuliza services and are able to utilize them during emergencies (Mean=4.62, std. dev=0.58). Additionally, M-Pesa has enhanced the operational effectiveness of the enterprises (Mean= 4.44, std. dev=0.49). It was also established that the SME's utilize M-pesa to receive payments for services rendered (Mean=4.53, std. dev=0.50). Furthermore, the SME owners are able to make daily sale deposits through M-Pesa (Mean=4.48, std. dev=0.50) and that they use M-Pesa to pay their employees and suppliers (Mean=4.65, std. dev=0.47). The implication of these scores is that most of the SME's in Urban informal settlements in Nairobi have adopted mobile banking in their operations.

4.4.3 Online banking

The mean and the Std Dev for the online banking are in Table 4.8. The results show that the SME's in urban informal settlements in Nairobi County significantly utilize online banking in their

operations. This is supported by the attributes related to online banking mean values were above 4, with a 4.53 mean and a 0.23 Std Dev on a 5-point scale.

Table 4.8: Descriptive Statistics for Online Banking

Statements	N	Mean	Std. Dev
I am able to transact online easily through online banking portals.	112	4.48	0.50
Online banking allows me to settle my outstanding bills directly through my bank account	112	4.60	0.49
I am able to track my account using online banking.	112	4.57	0.49
I am able to settle my outstanding bills through online banking	112	4.58	0.50
The presence of online banking has minimized loss of cash in my business enterprise	112	4.44	0.50
The banking time and transaction costs has reduced because of online banking adoption.	112	4.54	0.49
Overall mean Score	**112**	**4.53**	**0.23**

The findings revealed that with online banking, the SME owners are able to transact online easily through online banking portals (Mean=4.48, std. dev=0.50). Further, Online banking allows SME's to settle their outstanding bills directly through bank accounts (Mean=4.60, std. dev=0.49). Additionally, findings discovered that online banking assists the SMEs to track their accounts using online banking (Mean= 4.57, std. dev=0.49). The descriptive results also revealed that the SME's are able to settle their outstanding bills through online banking (Mean=4.58, std. dev=0.50). Furthermore, the presence of online banking has minimized loss of cash in majority of the business enterprises (Mean=4.44, std. dev=0.50) and that the banking time and transaction costs have reduced because of online banking adoption (Mean=4.54, std. dev=0.49). The implication of these scores is that most of the SME's in urban informal settlements in Nairobi frequently use online banking while conducting their business.

4.4.4 Mobile loan App services

The mean and the Std Dev for the attributes of mobile loan app services are presented in Table 4.9. The results show that the SME's in urban informal settlements in Nairobi County significantly utilize mobile loan app services in their operations. This is supported by the attributes related to mobile loan app services mean values were greater than 4, with a 4.34 mean and a 0.26 Std Dev on a 5-point scale.

Table 4.9: Descriptive Statistics for Mobile loan App services

Statements	N	Mean	Std. Dev
Mobile loan app lenders allow me to borrow funds to sustain my business	112	4.46	0.50
The presence of mobile loan app reduces the costs required in opening a bank account.	112	4.52	0.50
Through mobile loan app lenders, I can access credit from online digital lenders and financial planning tools.	112	4.49	0.50
Access to mobile loan app allows me to have sufficient cash in times of emergencies.	112	4.54	0.50
I obtain credible financial advice from mobile loan apps	112	4.61	0.58
Costs associated with mobile loan apps are lower than costs from bank loans	112	3.44	1.08
Overall mean Score	**112**	**4.34**	**0.26**

The findings revealed that with mobile loan app services, the SME owners are able to easily borrow funds to sustain their businesses (Mean=4.46, std. dev=0.50). Further, the presence of mobile loan app reduces the costs required in opening a bank account (Mean=4.52, std. dev=0.50). Additionally, mobile loan app services assist the SME's to access credit from online digital lenders and financial planning tools (Mean= 4.49, std. dev=0.50). Further, mobile loan apps allows the SME's to have sufficient cash in times of emergencies (Mean=4.54, std. dev=0.50). Furthermore, the SME's obtain credible financial advice from mobile loan apps (Mean=4.61, std. dev=0.58) however thy revealed that the costs associated with mobile loan apps are not lower than costs from bank loans (Mean=3.44, std. dev=1.08). The implication is that most SME's in urban informal settlements in Nairobi frequently use Mobile lending Apps while conducting their business.

4.4.5 Financial Inclusion

The mean and the standard deviation for the attributes of financial inclusion are presented in Table 4.10. The results show that the presence of Fintech services has significantly enabled financial inclusion among SME's in urban informal settlements in Nairobi County. This is supported by the attributes related to financial inclusion mean scores were more than 4, with a 4.51 mean value and a 0.22 Std Dev on a 5-point scale.

Table 4.10: Descriptive Statistics for Financial Inclusion

Statements	N	Mean	Std. Dev
The available financial technology services have enabled faster payment of services.	112	4.52	0.50
The available financial technology services have lowered the costs of financing for my business.	112	4.50	0.50
The available financial technology services have increased credit access for my business.	112	4.44	0.49
By using financial technology services, the growth of my business has been stimulated.	112	4.50	0.50
The presence of financial technology has increased my savings ability	112	4.49	0.51
The presence of financial technology has allowed me to access more financial services	112	4.59	0.49
Overall mean Score	**112**	**4.51**	**0.22**

The findings revealed that the available financial technology services have enabled faster payment of services (Mean=4.52, std. dev=0.50). Further, the presence of financial technology services have lowered the costs of financing for most enterprises (Mean=4.50, std. dev=0.50). Additionally, the available financial technology services have increased credit access for businesses (Mean= 4.44, std. dev=0.49). Also, by using financial technology services, the growth SME business has been stimulated (Mean=4.50, std. dev=0.50). Furthermore, the presence of financial technology have increased savings ability for most SME's (Mean=4.49, std. dev=0.51). Finally the presence of financial technology has allowed SME's to access more financial services (Mean= 4.59, std. dev=0.49). This implies that financial innovations have enhanced financial inclusion among SME's in urban informal settlements in Nairobi.

4.5 Correlation Analysis

The Pearson correlation was used in the study to establish a link between financial innovations and the level of financial inclusion. The results are in Table 4.11**.**

Table 4.11: Correlation Results

		Financial Inclusion	Agency Banking	Mobile Banking	Online Banking	Mobile loan app Services
Financial Inclusion	Pearson Correlation	1				
	Sig. (2-tailed)					
Agency Banking	Pearson Correlation	.381**	1			
	Sig. (2-tailed)	.000				
Mobile Banking	Pearson Correlation	.315**	.321**	1		
	Sig. (2-tailed)	.001	.001			
Online Banking	Pearson Correlation	.465**	.289**	.299**	1	
	Sig. (2-tailed)	.000	.001	.001		
Mobile loan app services	Pearson Correlation	.316**	.131	.184	.434**	1
	Sig. (2-tailed)	.001	.168	.052	.000	
**. Correlation is significant at the 0.01 level (2-tailed).						
b. Listwise N=112						

Table 4.11 indicated the r coefficient which indicates nature of the relationship and the p value which indicates the overall significance. A 0.381 correlation coefficient and a 0.000 P-value was established in the correlation analysis which indicate a moderate, positive, relationship between agency banking and financial inclusion. This is an indication that agency banking as a Fintech service is a significant financial inclusion enabler. A positive, but moderate relationship exists between mobile banking and financial inclusion, following a 0.315 correlation coefficient and 0.001 P-value finding in the correlation analysis. This is a sign that mobile banking is a key financial inclusion enabler among SMEs in urban informal settlements. Furthermore, a 0.465 correlation and a 0.000 P-value, were established between online banking and financial inclusion indicating a significant, positive, relationship. This is a sign that online banking is a significant financial inclusion enabler. Finally, a 0.316 correlation coefficient and a 0.000 P-value relationship, was found between mobile loan app services and financial inclusion showing a moderate, positive, the two and indicating that the presence of this services has significantly improved financial inclusion among SMEs in urban informal settlements.

4.6 Diagnostic Tests

When establishing the statistical values of variables under study using inferential measures, these models are based on the assumptions that the data used has a normal distribution. However, most of these statistical analyses have errors that need to be established. For this study, the normality, multicollinearity and heteroskedasticity tests were used to confirm the existence or non-existence of these errors. The absence of such errors confirms the data is suitable to be modelled. Normality was established using Shapiro-wilk's test. Multicollinearity was determined by the variance inflation factors and tolerance, while Heteroskedasticity was established using Levene's test. The findings of these tests are below.

4.6.1 Tests of Normality

In testing for normality in the dataset, the Shapiro-Wilk test was used. The purpose of this test is to establish the magnitude of data normalcy by determining if the data is skewed. The Shapiro-Wilk statistics are between 0 and 1, with a value above 0.05 indicating data normalcy. A value less than 0.05 is indicative of data significantly deviating from a normal distribution. This test was used in the study to confirm normality, and from the findings, all the variables had a p-value above 0.05. Table 4.12 shows the test results.

Table 4.12 Test of Normality

	Shapiro-Wilk		
Study variables	**Statistic**	**Df**	**Sig.**
Agency Banking	.871	112	.723
Mobile Banking	.832	112	.784
Online Banking	.799	112	.773
Mobile Loan App Services	.921	112	.815
Financial inclusion	.884	112	.812

From Table 4.12 above all the p values are above the standard limit of 0.05 thereby confirming that all data used was from a population with a normal distribution.

4.6.2 Tests of Multicollinearity

The Multicollinearity assumption established the existence of a correlation between each of the independent variables. To test for his assumption, the variance inflation factor (VIF) is normally used. This is tests works by measuring how the variance of estimated coefficient is inflated above

the case of zero independent variable correlation. A VIF factor of 1 establishes that no two predictor variables have a correlation. A VIF factor of 5 is indicative of multicollinearity and 10 show significant multicollinearity. The tolerance on the other hand measures the effect that one independent variable has on the rest of the independent variables, and is an inverse of VIF as shown in Table 4.13:

Table 4.13: Test of Multicollinearity

Variable	VIF	Tolerance
Agency Banking	1.30	0.769
Mobile Banking	1.27	0.787
Online Banking	1.25	0.800
Mobile loan App Services	1.36	0.735
Mean VIF	1.30	

Table 4.13 indicates that VIF values ranged from 1.27 to 1.36 with tolerance between 0.735 and 0.800. This indicated the absence of multicollinearity among the variables.

4.6.3 Tests of Heteroscedasticity

This assumption is established if variance of the errors of a response variable lack uniformity throughout the data. This error occurs when the error variances vary in relation to the values of the independent variables. In a regression analysis, heteroscedasticity occurs when the residual's spread shift over the range of values being measured. In an ordinary least squares regression, there exists an assumption that residuals are obtained from a population exhibiting constant variance. A high heteroscedasticity value in a regression can significantly distort the results weakening the analysis and increasing a type 1 mistake. Breusch-Pagan / Cook-Weisberg heteroscedasticity test was applied in determining homogeneity in the study. If the test is statistically significant $\alpha = 0.05$, there exists an uneven variance between groups. Table 4.13 shows the findings.

Table 4.14: Test of Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity		
Ho: Constant variance		
Variable: fitted values		
chi2(1)	=	0.7003
Prob > chi2	=	0.6429

From the above results, the null hypothesis of Homoscedastic error was not rejected, since the p value was 0.6429.

4.7 Regression Analysis

The regression model contains the model fitness, the ANOVA and the coefficients of the regression. The results of this analysis were as follows.

Table 4.15: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.558[a]	.312	.286	.1927186

a. Predictors: (Constant), Agency Banking, Mobile Banking, Online Banking, Mobile Loan App Services
b. Dependent Variable: Financial Inclusion

The financial innovations were adequate in explaining financial inclusion as shown in Table 4.15. This is further explained by the R square value of 0.525. As a result, Agency Banking, Mobile Banking, Online Banking, Mobile Loan App Services account for 31.2 percent variations in financial inclusion, and the remaining by factors not considered in the study. Another assumption of these findings is that the model is adequate. The 0.558 R value shows strong correlation between the independent factors and financial inclusion

Table 4.16: Analysis of Variance

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.802	4	0.450	12.126	.000[b]
	Residual	3.974	107	.037		
	Total	5.776	111			

a. Dependent Variable: Financial Inclusion

b. Predictors: (Constant), Agency Banking, Mobile Banking, Online Banking, Mobile Loan App Services

From Table 4.16, it can be ascertained that the model is significant, given a 12.126 F statistic and 0.000 p value. This establishes that financial innovations are good predictors of financial inclusion among SME's. The regression analysis displayed the magnitude of influence the innovations have on financial Inclusion.

Results established a positive notable relationship between agency banking and financial inclusion (β 0.316, P 0.000). It can hence be concluded that rise in agency banking by a unit would cause a 0.316 unit change in financial inclusion. A positive significant correlation was also established between mobile banking and financial inclusion (β 0.405, P 0.000**).**

Table 4.17: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.255	.477		2.632	.000
	Agency Banking	.316	.079	.236	2.728	.000
	Mobile Banking	.405	.073	.125	3.432	.000
	Online Banking	.292	.090	.303	3.231	.000
	Mobile Loan App Services	.342	.076	.131	2.466	.000

a. Dependent Variable: Financial Inclusion

From this, it can be concluded that a unit change in mobile banking subsequently enhances financial inclusion by 0.405 units. Furthermore, a positive significant correlation between online banking and financial inclusion (β 0.292, P 0.000) was found. This means that a unit change in online banking subsequently enhances financial inclusion 0.292 units. Lastly, a positive significant correlation between mobile loan app services and financial inclusion (β 0.342, P 0.000) was found. This means that a unit change in mobile loan app services subsequently enhances financial inclusion 0.342 units

The results were modelled as follows:

$$\mathbf{Y = 1.255 + 0.316X_1 + 0.405X_2 + 0.292X_3 + 0.342X_4}$$

Where

Y = Financial Inclusion,

X_1 – Agency Banking,

X_2 – Mobile Banking,

X_3 – Online Banking,

X_4 – Mobile loan App services

4.6 Discussion of Findings

This study sought to establish the effect of financial innovations on financial inclusion among SMEs in Nairobi's urban informal settlements. Specifically, the study's objective was to determine the effect of financial innovations on financial inclusion among these firms. Primary data was collected using questionnaires and analyzed through descriptive, correlation and regression analysis. The findings indicate that Fintech services have significantly adopted by SMEs in Nairobi's urban informal settlements and has significantly improved financial inclusion.

The findings on Agency banking concur with Waihenya (2014) who studied the relation between agency banking and financial inclusion and established that it is the most popular banking service adopted in Kenya's rural areas which are characterized by poor infrastructure and long distances to nearest financial institutions. In the study it was found to be the most common method of accessing financial institutions hence aiding in financial inclusion. The findings of the current study were however based on SME's in urban informal settlements in Nairobi, which yielded the same findings as the study by Waihenya (2014) that found agency banking as a financial inclusion enabler.

The findings on Mobile banking concur with the study by Antoine and Leo (2017), on mobile money and financial inclusion and established that most of the poor, uneducated and low-income groups derive massive benefits from mobile banking because they are able to obtain faster and more frequent transactions. It also supports findings by Joseph (2018), who established that mobile money technology has a profound impact on financial inclusion in the country. The recommendations from this study were that policymakers should consider mobile technologies when formulating financial inclusion policies. Similar results were posted by Wamuyu (2014), who established that M-Pesa technology significantly impacts financial inclusion within Kenya.

Results on online banking support findings by Donner and Escobari (2018) who noted that online transactions have a significant impact on corporate growth. It also supports the report by the CBK in 2015, which established that online banking surpassed all forms of electronic payments such as use of ATM cards in Kenya, hence being heavily utilized by individuals as well as businesses. The study also established that the number of customers using online banking services had significantly increased during the period. This was supported by DemirgüçKunt et al. (2015) who cited Kenya as the Sub-Saharan Africa leader in the number of online Kenya is the leader in online banking. From the findings, Kenyans a majority of the population in Kenya who use such services surpasses the number of users in other nations in the region. The case applies to SMEs in urban informal settlements who heavily rely on online banking services

Finally, findings on mobile loan app services support findings by Mlady (2016), who stated that these technology-based lenders have made a significant progress towards the lowering of cost of credit thereby enabling more low-income customers access credit facilities. They also support the study by Edward, Delbridge, and Munday (2011), on the impact of innovation on SMEs' financial performance established that innovation notably impacts performance of SME's. They established that the mobile lending apps have significantly bridged the financial inclusion gap and improved access to financial services by low income earners.

This study was based on two theories namely the technology acceptance model and diffusion of innovation theory. The findings of the study are in support of the theories. This theory has influenced technology acceptance. TAM was utilized to discover how technology impacts the performance of Kenya's SME's and how its accessibility impacts financial inclusion, and it was revealed that indeed the SMEs have adopted financial technology which has improved their level of financial inclusion. Diffusion of innovation theory communicates how technologies are adopted in organizations and in the current study it explained how financial technology is adopted and the extent of adoption

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the above study, it discusses the summary of the study, draws a conclusion in relation to the findings and proposes recommendations for policy interventions and for future research based on the outcomes of the objectives of the study. Lastly the chapter discusses the limitations encountered and suggestions for future studies based on the limitations.

5.2 Summary of Findings

The objective was determining the effect of financial innovations on financial inclusion among SMEs in urban informal settlements in Nairobi County. More specifically, the study objective was to determine the effect of innovations like agency banking, mobile banking, online banking and mobile loan App services on financial inclusion among these enterprises. The Descriptive design was suitable in achieving the study objectives outlined. A target sample of 150 respondents were selected, one from every SME in urban informal settlements for the study, of which 112 adequately responded. It was established that the 112 responses were equivalent to 74.6% that was adequate for the study. Data was collected from the 112 respondents through issuance of closed-ended questionnaires that were issued through both drop and pick later method and through google forms. The analysis yielded both descriptive and inferential statistics including mean scores and standard deviations. For the inferential statistics, the Pearson's correlation and regression analysis were applied.

For each of the stated research objectives and the general characteristics of the SME's was provided. From these findings, majority of the SMEs in urban informal settlements were sole ownerships and partnerships. This revealed that most SME's do not have a complicated legal structure. The study also confirmed that majority of the SMEs have 10 or less employees and most have been in existence for between 2 and five years. This might be explained by lack of financial resources to operate in large scale. The study findings reveal that the presence of Fintech positively impacted financial inclusion. The respondents agreed that through the use of financial innovations such as agency banking, mobile banking, online banking and Mobile loan app services, they have been able to access more financial services than before which has improved their enterprises. Using this technology they obtain credit from financial institutions, mobile lending apps have assisted

them gain enough finances to expand, through Agency banking, they have been able to access their bank accounts easily and avoid holding too much cash. Through the mobile loan apps, they are able to obtain loans to cater for operating expenses and that ability to access mobile lending apps enables them to have a quick response to existing business emergencies.

With increased access to payment and savings services enabled through Fintech it was however noted that the cost of mobile loans was significantly higher than the cost of loans from financial institutions. This was observed from the descriptive statistics in which the respondents were asked if the cost of loans was lower for the mobile loan apps for which they gave a moderate response. This indicates that even though mobile loan apps brought services close to the people, their financing costs were much higher compared to costs by established financial institutions. The descriptive statistics regarding financial inclusion revealed that Fintech services have enabled faster payment of services and increased savings, they have also stimulated businesses among SME's by availing credit and providing needed financial services. In overall, they have improved the access and usage of financial services.

5.3 Conclusions

The study found that financial technology has been adopted to a great extent by SMEs in urban informal settlements in Nairobi County. Most of the SMEs utilize agency banking, mobile and online banking and mobile lending apps in their phones to obtain financial services and obtain credit to finance their businesses. The study also concluded that financial technology has a positive impact on financial inclusion. This was shown by the regression and correlation results which support the results as there existed a positive substantial relation between financial innovations and financial inclusion.

The descriptive statistics regarding financial inclusion revealed that since the introduction of financial technology such as agency banking, mobile banking, online banking and mobile loan apps, more SME's have been included in the formal financial services. Financial technology has enabled faster payment services, expanded savings ability, enabled SME's to pay their employees and suppliers easily and access loans to expand their existing businesses.

5.4 Recommendations for Policy and Practice

The study revealed that Fintech positively impacts financial inclusion. The study thus recommends that SMEs in Urban informal settlements should be more vibrant in adopting the financial technology available as this would boost their firm performance since it will allow them to access financial services easily hence being more financially included. To achieve this, the study also recommends policymakers to establish policies that allow SMEs in Urban informal settlements to obtain mobile credit from providers at low cost. This follows the observation from the study which established that the cost of financing from mobile lending apps is higher than conventional financial institutions. Policy makers should establish policies that would lower the cost of financing for the SME's

Another recommendation from this study to the government is that it should create an enabling environment that favors the growth of Fintech firms. This is because of the benefits that these firms create like providing financial services to the excluded and marginalized population in Kenya such as those living in poverty stricken and rural areas in the country. Providing these services would improve the level of financial inclusion in the country and promote economic growth and development.

5.5 Limitations of the Study

In completing this study, heavy reliance was placed on the use of primary data that was obtained using questionnaires, of which a total of 38 participants failed to adequately complete the questionnaires. Some participants also failed to complete the required questions thus compromising the reliability of the results and forcing the researcher to make constant follow-ups to have them completed. Furthermore, a number of respondents had confidentiality concerns while giving their responses. In spite of this, they were assured that their responses were only used for academic purposes.

The focus of this study was on some variables that are assumed to impact financial inclusion among SMEs in Nairobi's urban informal settlements. Specifically, the study focused on Agency banking, Mobile banking, online banking and mobile lending. Realistically, there are other factors likely to impact financial inclusion among the firms like technology adoption, poverty, and illiteracy levels, and other external factors like industry regulations.

To complete the data analysis process, the multiple linear regression model was utilized. The use of this model can at times generate erroneous and misleading findings resulting from changes in variables such as financial inclusion thereby making it impossible for the researcher to accurately generalize the study findings. Also, in the case that any data is added to the model, it may yield different results.

5.6 Suggestions for Further Research

Additional studies should focus on gaps discovered in this study. This study was on effect of Fintech on financial inclusion among SMEs in urban informal settlements in Nairobi County. Therefore, a similar investigation can be done on other SMEs in other areas specifically in rural Kenya or other firms in Kenya for purposes of comparisons. All the factors that influence financial inclusion among SMEs were not exhausted in the study, and therefore future studies should focus on other variables such as growth strategies, knowledge management, literacy levels, and levels of poverty among other variables. Determining how every variable affects financial inclusion, will be useful to policy makers in implementing an appropriate mechanism to enhance financial inclusion.

Finally, the study used the multiple linear regression model to establish the objectives of the study. The model has limitations like errors and misleading findings in case of a change in one variable. Future researchers consider adopting other models like the Vector Error Correction Model (VECM) to explore the different relations between financial innovations and financial inclusion.

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APPENDICES

Appendix I: Questionnaire

This questionnaire is structured to obtain information on the 'effect of Fintech on financial inclusion among SME's in Urban Informal Settlements in Nairobi County, Kenya.' I have invited you to participate in our research by filling out this closed-ended questionnaire to help advance knowledge on this topic. Mark a response with a tick (√) on your choice. The information gathered in this questionnaire will be for academic purpose only and confidentiality will be observed.

PART A: SME PROFILE

1). What is the legal structure of your business

a. Sole ownership [ ]
b. Partnership [ ]
c. Limited company [ ]
d. Co-operative society [ ]

2). How long has your business been in existence? ……..

3). In Which Sub-sector do you operate in?

a. Trade sector [ ]

b. Manufacturing sector [ ]

c. Services Sector [ ]

4). What is the number of employees in your enterprise?

Less than 5 [ ] b) 5 – 10 employees [ ] c) 11 – 20 employees [ ]

d) 21 – 35 employees [ ] e) 36 – 50 employees [ ]

PART B: AGENCY BANKING

Which of the following statements do you agree with the most? On a scale of 1 to 5, how would you rate this? (1 Strongly disagree, 2 Disagree, 3 Neutral, 4 Agree, 5 Strongly Agree)

STATEMENT	1	2	3	4	5
With Agency banking, I can make daily deposits of sales directly to my account thereby avoiding handling too much cash					
Agency banking allows more extended banking hours thereby allowing deposit and withdrawal of funds at the closure of banking hours.					
Agency banking allows me to efficiently pay my employees					
Agency banking has reduced time and costs required to access the enterprise's bank accounts					
Use of Agency banking has reduced my costs of operation					
Agency banking has assisted my business to scale on a higher level while acting as a source of income through agency banking.					

PART C: MOBILE BANKING

STATEMENT	**1**	**2**	**3**	**4**	**5**
I am able to save money to my M-shwari account using M-Pesa to raise my loan limit.					
I am aware of Fuliza and I use it during emergencies.					
M-Pesa has enhanced the operational effectiveness of my enterprise.					
I utilize M-pesa to receive payments for services rendered					
I make daily sale deposits through M-Pesa					
I use M-Pesa to pay my employees and suppliers.					

PART D: ONLINE BANKING

STATEMENT	**1**	**2**	**3**	**4**	**5**

I am able to transact online easily through online banking portals					
Online banking allows me to settle my outstanding bills directly through my bank account					
I am able to track my account using online banking					
I am able to settle my outstanding bills through online banking					
The presence of online banking has minimized loss of cash in my business enterprise					
The banking time and transaction costs has reduced because of online banking adoption					

PART E: MOBILE LOAN APP SERVICES

STATEMENT	**1**	**2**	**3**	**4**	**5**
Mobile loan app lenders allow me to borrow funds to sustain my business					
The presence of mobile loan app reduces the costs required in opening a bank account.					
Through mobile loan app lenders, I can access credit from online digital lenders and financial planning tools.					
Access to mobile loan app allows me to have sufficient cash in times of emergencies.					
I obtain credible financial advice from mobile loan apps					
Costs associated with mobile loan apps are lower than costs from bank loans					

PART F: FINANCIAL INCLUSION

STATEMENT	**1**	**2**	**3**	**4**	**5**
The available financial technology services have enabled faster payment of services.					
The available financial technology services have lowered the costs of financing for my business					
The available financial technology services have increased credit access for my business					
By using financial technology services, the growth of my business has been stimulated					
The presence of financial technology have increased my savings ability					
The presence of financial technology has allowed me to access more financial services					

Thank you for your co-operation