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Effect of digital financing on access to credit among farmers in Kirinyaga County.

Kiragu, Alex
Strathmore Business School
Strathmore University

EFFECT OF DIGITAL FINANCING ON ACCESS TO CREDIT AMONG FARMERS IN KIRINYAGA COUNTY

ALEX KIRAGU

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

Sign:  Date: 7th September 2022

Alex Kiragu

Reg no: 114285/2018

The dissertation of Alex Kiragu was approved by the following:

Sign:  Date: 7th September 2022

Dr. David Mathuva

Senior Lecturer

Strathmore University

Dr. Angela Ndunge

Ag. Executive Dean

Strathmore University Business School.

Dr. Bernard Shibwabo

Director, Office of Graduate Studies

DEDICATION

I dedicate this dissertation to my lovely children, who hold the future; wife; father and mother, especially mum for continuous encouragement; family and friends; and the good hearted people of the County of Kirinyaga who participated in the research.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

ICT	Information Communication and Technology
ANOVA	Analysis of Variance
APR	Annualized Percentage Interest Rate
KCB	Kenya Commercial Bank
NACOSTI	National Commission for Science and Technology
SDG	Sustainable Development Goals
SPSS	Statistical Packages for Social Scientists
USSD	Unstructured Service Data

OPERATIONAL DEFINITION OF KEY TERMS

Access to Credit	Refers to changes in amount of credit accessed per annum (Ahmed, 2013).
Fintech Ecosystem	Refers to start up attractiveness and innovation index (Ekmekcioglu & Barak, 2012).
Fintech Infrastructure	Refers to mobile subscription density, internet density, electricity coverage and grid reliability (Kama & Adigun, 2013)
Regulatory Environment	Refers to level of political instability, strength of legal rights and corruption (Salim & Sulaiman, 2011).
Urgency of Financial Inclusion	Refers to the credit gap, unbanked population, poverty levels and rural population (Muteke, 2015).

ABSTRACT

Access to financing especially in the developing world has been an issue in a long time. Economic development model in the developing works has not been inclusive towards financial inclusion and exclusion but with influx of digital finance the trend has been reversed. Hence, the current study aims at examining the effect of digital finance in access to credit among farmers in Kirinyaga County. Specifically, the study aimed at examining the effect of digital finance infrastructure, digital finance ecosystem and regulatory environment on access to credit. The study was founded on supply leading hypothesis and diffusion of innovation model. The study applied descriptive correlation research design and collect primary data using questionnaires among 338 respondents selected through stratified sampling. Descriptive and inferential statistics analyzed the data that was presented in figures and tables. Results of the study revealed positive and significant effect of digital fintech infrastructure, digital fintech ecosystem and regulatory environment on access to credit among farmers in Kirinyaga County. From the findings it can be concluded that an increase in fintech infrastructure would result in an increase of credit accessibility among farmers in Kirinyaga County. Secondly, an increase in fintech ecosystem would lead to an increase in credit accessibility among farmers in Kirinyaga County. Further, an increase in regulatory framework would lead to an increase in access to credit among farmers in Kirinyaga County. The study recommends management of digital lending financial institutions to innovate lending solutions that can be accessed easily through mobile devices used by most farmers. Stakeholders such a telecommunication companies, commercial banks, technology firms and the government should be involved in establishing a solid financial ecosystem that will help farmers in accessing credit while at the same time protecting their rights. Digital lenders should also provide clear terms for farmers before accessing loans and clearly define the responsibilities of both parties.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Developed and emerging markets have intensified the efforts of promoting financial inclusion. According to Sang, Zakayo and Kibas (2019) financial inclusion is collection of activities and processes aimed at formally and informally enhancing access of affordable, reliable and quality financial services. Awuach and Addaney (2016) allude that through financial access productivity, employment and economic growth has amplified while poverty levels have dwindled. Although, measures have been deployed not everybody has been included in formal financial institutions. Consequently, there is the need for adoption of alternative measures of financial services provision.

Statistics on financial inclusion is Kenya while compared with African and Asian counterparts indicates that the level of financial deepening is higher. It is characterized by use of innovative products and financial services that have opened alternative means for meeting financial demand. Mwai, Njeru and Memba (2020) argue that at least 70% of Kenya adult population is connected with mobile phone. Moreover, there is a positive growth in account registration. Adoption of mobile to undertake banking transactions is dominant through use of it for savings, payments, deposits and withdrawals from banks. By 2019, penetration of banking access was at 31% with 81% mobile phone access where 67% were linked to their bank accounts. Ease of mobile money access is linked to partnership between financial institutions and telecommunication companies to create innovative financial products. This may not be achieved in absence of financial liberalization.

Digital financial have emerged as an alternative source of financing whereby credit services are instant, remotely evaluated and disbursed contingent to positive credit scores (Onay & Ozturk, 2018). Furthermore, digital lenders rely on computerized algorithms and machine learning for credit worthiness examination. Runciman and Gordon (2014) allude that through digital revolution it is easier for credit providers to determine odds of loan repayment among different stakeholders. This was cemented by Marshall, Mueck and Shockley (2015) assert courtesy of real time data analysis it is easier for lenders to develop customized credit evaluation criterion.

Institutions that have incorporated use of data have advantage while sorting, correlating and exploring patterns that may be useful in market segmentation and decision making (Dubey & Gunasekaran, 2015). This approach has forced financial institutions to adopt alternative means of providing financial services to unbanked population. According to Alliance for Financial Inclusion (2018) there are higher odds of financial inclusion in Africa adopting sigmoid growth curve associated with high population growth rate.

Although, financial penetration worldwide is positive, there is need for adoption of innovative approaches and technologically based models to venture into new markets (Cobla & Osei-Assibey, 2018). This would ultimately create an avenue for business growth and economic empowerment more so among newly banked population. Development of innovative financial products may be skewed since there are skewed access of equity, poverty and growth of informal credit providers. Asongu and Odhiambo (2019) allude that incorporation of digital financial services have led to women economic empowerment, minimization of agricultural value chain wastes, elimination of income in-equilibrium,

management of domestic violence and eradication of agricultural wastes in its value chain. Despite of expected benefits from financial inclusion their success is hindered by level of financial liberalization in respective country.

In developed digitization of financial services have been applied as mode of poverty eradication. In China despite of organized financial inclusion, they are challenged by asymmetric poverty levels. This was addressed through specialized financial services for instance agriculturally based banks which managed levels of information asymmetry and minimization of transaction costs. Courtesy of digital innovation China developed Peer to Peer (P2P) online lending, financial assets sales and crowd funding approaches. There was an asymptotic growth in digital financial services from 2013 upon introduction of Yu'ebao online platform and money market fund. This growth was hailed to technological development and response of traditional financial institutions to individual financial needs (Yum, Lee & Chae, 2012).

In America, digitization of financial services has been undertaken through banks and technology-based companies. Rating of Fintech Adoption Index (2017) indicates that at least 50% of Americans have access to digital financial services like lending and savings. Derayal Financial (2017) argues that dominance of P2P lending was hailed to lack of mediation between financial institution and its customers. Yum, et al., (2012) asserted that mobile credit is easily available due to their short-term nature and accessibility with no collateral security. This shows the need for provision of long-term finance. Furthermore, these new approaches can be credited desire to seek gain from alternative financial models. Provision of digital financial services in America is lower compared to developing economies since Americans

have preference on use of credit and debit cards. According to Komarova and Gonzalez (2015) in Europe digital lending is led by individual investors. They initially aimed at eradicated levels of information asymmetry that locked some individuals from accessing credit. In Germany digital lending penetration is lower due to escalating cases of frauds and data threats.

In Africa, digital financial services penetration is contingent to provision of mobile services. for instance, Ghana have recorded commendable growth in mobile money services despite of having four players in mobile sector (Cobla & Osei-Asbey, 2018). Moreover, Batista and Vincente (2013) argue that in Mozambique financial inclusion is achievable contingent to levels of financial innovations. There was call for financial liberalization so as to support financial needs among different groups. Thakur & Srivastava (2013) argue that through digital financing its possible to provide financial services among rural population. The gains of financial inclusion were only possible if financial regulation were supportive to different financial disruption options available.

The growth of digital lending in East Africa is faster as compared to commercial banks loans. This is associated with interpolability of financial services with mobile phone product growth and development (Fanta & Makina, 2019). Moreover, access of digital financial services in Tanzania was at least 35% could easily access more than mobile service provider. Hence, there is need for positive regulation response to financial innovation growth and development.

According to Ndungu, Morales and Ndirangu (2016) the rate of growth of digital credit in Kenya is higher as compared to other East African counties. Furthermore, in some instances, it has recorded 300% growth. This has led to increased acceptance among target consumers. Francis, Blumenstock and Robinson (2017) at least 20% of those who have access to digital financial products they may have sourced for credit at least once. Digital lenders associations of Kenya indicated that there are at least 20 digital lenders with numbers growing spontaneously. There are alternative platforms for digital lending in Kenya, they include use of Sim tool kits, mobile lending apps, payroll-based lending apps and Unstructured Supplementary Service Data (USSD). According to Kaffenberger and Chege (2016) loans provided through digital lending platforms ranges from Kshs 50 to 1 million. Repayment period range from seven to a year. Their major drawback is their oppressive nature through charging of exorbitant interest rates that range from 12% to 621% per annum.

M-Shwari, a digital loan product was introduced in 2012 by Commercial Bank of Africa and Safaricom. The platform has dispersed at least 200 million loans. Similarly, KCB introduced, a mobile lending platform that it relies on to distribute at least 90% of its mobile lending loans (Alliance for Financial Inclusion, 2018). Further, Fuliza an overdraft facility to M-pesa customers have recorded tremendous growth.

Attractiveness of digital lending as tool for financial deepening cannot be ignored (Francis et al., 2017). Although, digital credit is wide spread, there is need for sensitization among consumer to enhance their acceptance. Moreover, despite of high uptake rate of digital financial services the rates of loan default is high. Francis, et al., (2017) approximately 50% of blacklisted borrowers in Kenya had digital loan. This raises concern on allocation of these

loans, consumer protection capacity and the degree of risk associated with these loans (Kaffenberger & Chege, 2016). According to Wanjiru (2016) there is no congruence on how digital on value contribution of digital lending on financial inclusion in specific sectors. In contrast, Fin-access survey (2021) allude that there is a positive grow in financial deepening from 26.7% (2006) to 73.5% (2016) and 82.9% (2019). This have been credited to exponential growth in mobile lending, deployment of transformative financial technologies and innovations and government incentives and policies. Though these findings were generated among Kenyans, there is need for localized study drawing respondents among farmers in Kirinyaga County. Kirinyaga County is considered since the main economic activities are agricultural based and despite of farmers being members of cooperative societies the dominant model of farming is small scale. Could this approach be linked to credit access. Thus, the need for customized study to examine the effect of digital finance on access to agricultural credit in Kirinyaga Central sub-County.

1.2 Statement of the Problem

Developed and developing economies have devised measures aimed at eradicating escalating levels of poverty. Hwang and Tellez (2016) argue that poverty can be eradicated if measures on provision of employment, easing access to factors of production and development of economic stimulus packages. This will be in line with Sustainable Development Goals (SDGs) and World Bank development agenda 2030 (World Bank, 2018). Achievement of these gaols would be possible if financial services are easily accessible among different stakeholders. Majority of small and medium enterprises are excluded from financial institutions. Hence, fintech lenders have penetrated the market to resolve the gap. When

interest rate capping was in place, though it mitigated the cost of credit it had negative externalities, occasioned by reduction in credit lending by commercial banks (Central Bank of Kenya, 2018). Thus, digital lenders proliferated and deployed technology in response to credit demand.

To respond to need for financial inclusion, empirical literature has documented that increased household income access stimulates consumption, investment and access to emergency funds among households (Kama & Adigun, 2013). In contrast, access to exorbitant loans have higher odds of leading to financial distress among households (Ekmekcioglu & Barak, 2012). Moreover, Duvendack and Mader (2019) expensive loans may have no meaningful contribution on economic needs of poor and low-income earners. Hence, the need for localized study to examine co-movement between digital finance and agricultural credit access in Kirinyaga Central sub-county.

Empirical evidence in Kenya by Prashat, Jack and Suri (2019) indicated that digital credit has significant contribution on resilience to economic shocks. Wamalwa, Rugiri and Lauler (2019) documented significant impact of digital credit access and household in-debt acquisition in Kenya. The studies pose gaps that may have been addressed through adoption of customized examination on the effect of digital finance on agricultural credit access in Kirinyaga County.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of the study examined the effect of digital financing on farmers access to credit in Kirinyaga County.

1.3.2 Specific Objectives

Specific objectives of the study were to:

i. Establish the effect of digital credit infrastructure on farmers' access to credit in Kirinyaga County.
ii. Examine the effect of digital credit ecosystem on farmers' access to credit in Kirinyaga County.
iii. Find out the effect of regulatory environment on farmers' access to credit in Kirinyaga County.

1.4 Research Questions

i. Does digital fintech infrastructure have effect on farmers to credit in Kirinyaga County?
ii. What is the effect digital fintech ecosystem on farmers access to credit in Kirinyaga County?
iii. How does regulatory environment affect farmers to credit in Kirinyaga County?

1.5 Significance of the Study

1.5.1 To Management of Digital Lenders

Although, most companies aim at maximizing their profits, there is need for examination on the value contribution of their innovations on different stakeholders. From the study findings, policy makers, management and scholars. Companies need to be socially accountable for their actions, products and services, especially to their stakeholders, which include their customers. This study may assist these companies with their corporate social responsibilities, by given them a picture of what effect their mobile loans are having on the society, specifically low-income earners. This may give them an insight on what they can do better, and which necessary improvements that need to be made to their services.

1.5.2 To Regulatory Authority and Policy Makers

Most industries have regulatory bodies that establish regulatory frameworks which protect both the businesses and consumers. This study aims to advocate for the necessity of a regulatory framework for digital credit, as well as help in making the necessary policies that will protect low-income mobile loan borrowers. It may raise more awareness on issues such as exorbitant interest rates and troublesome repayment terms that have filled the mobile lending industry. It may help to push the agenda of the Financial Conducts Management Bill (a proposal for the licensing and regulation of digital lenders including setting interest caps by the Financial Markets Authority) though the bill is pending in parliament.

The study may provide important insights to mobile loan borrowers. It may assist these borrowers to further assess the effects of mobile loans in their lives and assist them in making informed decisions with regards to digital borrowing.

1.6 Scope of the Study

The study relied on primary data that was collected through issue of questionnaires. The study was limited to 2157 farmers from six farmers' cooperative societies. A sample of 338 farmers was selected through stratified sampling. Descriptive and inferential statistics were used for data analysis. The study was anchored on supply lead hypothesis and diffusion of innovation model. The study was carried out in October 2021 – February 2022.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter the theoretical and empirical literature will be presented. The study will be founded on supply leading hypothesis and diffusion of innovation model. Empirical literature will examine the causality between digital finance and access to credit. Further, conceptual framework will be presented.

2.2 Theoretical Literature Review

2.2.1 Supply Leading Hypothesis

Supply leading hypothesis was documented by Schumpeter (1911). The theory alludes that financial development have value contribution on economic growth in an economy. There is no need of financial intermediaries if there are no transaction, monitoring and information access costs. Escalating levels of these costs have implications on financial access since financial agents may transfer them to customers. This led to development of financial institutions that minimized financial intermediation expenses.

The theory argues that if financial sector is well developed then it should minimize costs that hinders achievement of financial intermediation. To stimulate economic development financial intermediaries should nurture culture of savings, resources mobilization, risk management and portfolio diversification. Through, them Schumpeter (1911) alludes that it

would lead accumulation of human and physical that will nurture technological innovation and changes in states of economy.

The theory supports the study through arguments on how the theory supports the study and enhanced achievement of financial access through adoption of technologically supported products. Thus, to respond to the need for financial inclusion there is need for adoption of technologically based financial products that can be easily integrated in mobile platforms. Owing to growth in usage of mobile phones then it sourcing credit services through mobile platforms among farmers would enhance financial access. The government policies should be aimed at enhancing level of financial liberalization that may ultimately support financial access among heterogeneous groups. There is need for adoption strategies aimed at enhancing mobile subscription density, internet density, electricity coverage and grid reliability. Further, the regulatory environment would be reliable contingent to political stability and adoption of corruption eradication measures.

2.2.2 Diffusion of Innovation Model

Innovation diffusion theory was developed by Rogers (2003) the theory aimed at explaining how an idea or product gains momentum over time within a given population. Technology is perceived to be adopted if an individual incorporates it to achieve change as compared to previous mode of operations. Innovation decision making was perceived to be dependent on individual characteristics (income), social attributes whereby it can be perceived to violate ethical and social norms of elite and perceived attributes of innovations.

Rogers (2003) asserts that there are four main elements of diffusion of innovation. They are innovation, communication channels, time and social systems. Innovation can be defined as new product or idea that is meant to change current state of affairs. Innovations is related to knowledge, persuasion and decision. Technological adoption will be dependent on its capacity to alleviate challenges that may increase resistance to change. Rogers asserts on the need to discuss advantages and disadvantages of technology adoption. Technology outcomes can be classified as functional or dysfunctional, direct or indirect and anticipated or unanticipated.

According to Rogers (2003) there is need for creation of communication channels aimed at creating consensus among different stakeholders involved in technology adoption. Communication can be channelled through mass, social, localite and cosmopolite channels. Innovation diffusion being a social process there is need for creation of interpersonal relationship. In interpersonal relationship there are higher odds of individuals sharing similar characteristics as compared to diffusion that calls for heterogeneity of attributes. Moreover, communication channels can act as the link between internal and external stakeholders. Due to differences of information required, mass media and cosmopolite channels can be used in knowledge stage while localite channels and interpersonal can be used at persuasion stage of decision-making process. Phases of technology adoption are dependent on time five phases. Rogers (2003) argues that social system a set of interrelated components integrated together to solve a problem or achieve common goal.

Rogers (2003) argues that innovation decision process is an information seeking and process activities aimed at uncertainty reduction on its advantages and disadvantages of innovation.

Innovation in a five-stage process comprising of knowledge, persuasion, decision, implementation and confirmation. These phases are achieved in hierarchical manner. In knowledge stage an individual learns about innovation with an aim of understanding how it can achieve desired goals. Knowledge can be classified as awareness knowledge, how knowledge and principal knowledge. Awareness knowledge provides innovation that can create desires for understanding how innovation will work. How knowledge describes how innovation can be used correctly. To increase likelihood of technology adoption there is need for seeking more information on how to use innovation before trial. Principle's knowledge describes operational guidelines of technology. Technology adoption is highly dependent on understanding of its principles.

In persuasion phase individual attitude towards innovation can be changed though it does not lead to acceptance or rejection (Rogers, 2003). Attitude towards innovation is dependent on an individual. Unlike knowledge phase that is cognitive, persuasion is affective. Individual participation in innovation is mostly in persuasion stage. Hence, their opinion is determined by opinions and beliefs of others. In decision stage, individuals have a choice on acceptance or rejection of innovation. Rogers (2003) defined innovation adoption as use of better alternative available to solve problems or achieve desired goals. To increase likelihood of acceptance of innovation then there is need for systematic implementation. Innovation rejection can be passive or active. In active rejection an individual pursues innovation that is not ultimately accepted unlike passive rejection whose decision is made outright.

In implementation phase, an innovation is experimented. While implementing innovation there is need for involvement of all stakeholders to increase likelihood of its acceptance.

Further, technical experts should be actively involved in developing skills of users of technology being adopted (Rogers, 2003). In this phase, innovation is reinvented to meet users' specific needs. The faster the reinvention the faster the acceptance of innovation. In confirmation stage, decision on users' support is sought. Rogers (2003) asserts that the decision can be reversed if there are conflicts. Technology adopted seeks for support of their investment decisions. In this phase, attitude of users is crucial since negative attitude would lead to discontinuance. Discontinuance can be pursued through replacement. Moreover, there can be disenhancement discontinuance due to dissatisfaction and failure of technology meet desired needs.

The level of technological adoption is dependent on relative advantage, this is the degree to which innovation is perceived to be superior to the current program or product being replaced. Compatibility, refers to how consistent the innovation is in line with values, experiences and potential needs of adopters. Complexity, the ease of understanding and using the system. Triability, this is the extent in which innovation can be experimented prior to its adoption. Observability, this is the measure on how technological adoption provides tangible results (Rogers, 2003).

The theory is appropriate for the study since there is need for development measures aimed at enhancing financial access through use of digital models. There is need for development of financial products that are in response to level of digital finance technology infrastructure and digital finance ecosystem. Innovativeness in the financial sector would enhance financial access among start-ups and ease in provision of financial services among banked and unbanked population.

2.3 Empirical Literature Review

2.3.1 Digital Finance Technology Infrastructure and Access to Credit

Investment in Information Communication and Technology (ICT) such as computers and telecommunications are aimed at improving economic importance (Suri, et al., 2019). Incorporation of ICT aids in information sharing, gathering, coordination, quality improvement, response to customer needs and innovation (Karlan & Zinman, 2010). Although, this adoption may not directly impact performance it has implication on optimization of costs. This is achievable through incorporation of ICT infrastructure in reduction of product search and selection of alternative supply of services to target customers (Anderson, et al., 2017). In most instances, ICT investments are adopted by corporate entities is aimed at responding to market changes and volatility in business environment (Ekmekcioglu & Barak, 2012). Moreover, ICT lowers operational costs and amplifies organization performance that may be achieved through discovery of alternative markets. There is no guarantee of sustainable profitability since there are higher odds of emergence of competition, entry of new entrances and technological changes that an organization may not be able to respond to.

Development in the financial is pivotal to achievement of economic growth and investment sustainability. Theoretical support on financial sector development, proponents of growth hypothesis allude that financial intermediary support economic growth through optimal allocation of financial resources through incorporation of market-based lending rates (Noruzy et al., 2013). Financial deepening is credited to be

the yolk of functionality of economic system and support of investment and savings. Some proponents of financial liberalization perceive that increased interest rates would mobilize resources and support innovation to enhance financial services provision to unbanked set. Financial liberalization policies are perceived to be impetus for elimination of distortive policies, administration control and augmentation of aggregate demand in different sectors of the economy. Financial liberalization has positive and inverse contribution in the economic growth. According to Odhiambo (2011) financial liberalization has positive contribution in economic growth but Ahmed (2013) associated with financial fragility and banking crisis in Africa.

2.3.2 Digital Finance Ecosystem and Access to Credit

Financial ecosystem has metamorphosized and developed new financial products and alternative means for provision of financial services in non-traditional platforms (Ekmekcioglu & Barak, 2012). Notable financial innovations deployed by financial institutions include mobile banking, agency banking, credit cards, paperless banking, payroll management among others. These financial innovations have been hailed as sources of financial inclusion. Adoption of mobile money has enhanced access to financial services. Moreover, these innovations have significant contribution to inclusion of excluded rural population.

Andianaivo and Kpodar (2011) allude financial inclusion was achievable through mobile phone development. Kama and Adigun (2013) argue that financial inclusion is possible through infrastructure adequacy and efficiency of technology development. Dupas and

Robisson (2009) argue that some population in developing economies is excluded from formal financial system. This has eroded their production capacity, income and consumption and have increased their exposure to illness and unforeseen events.

According to Salim and Sulaiman (2011) organization innovation can be adopted as source of competitive advantage. This is achievable since an organization better understands its customer needs and response mechanisms towards their rivals. In Malaysia, innovation has been hailed as source of business performance (Noruzy et al., 2013). This was attributed to joint contribution of transformation leadership, knowledge management and organization learning. Boachie-Menshand (2015) purported that at least 50% of firm performance is attributed to innovation. Mugo (2012) argue that organization performance is associated with innovativeness, governance, entrepreneurship, technological development and ownership. Rosti and Sidek (2013) credited firm performance on production. Kojo (2013) allude that among microfinance institutions savings and credit platforms in response to poor and marginalized population that may have no access to traditional platforms. Nader (2011) alluded that availability of phone banking has positive contingent on profit efficiency.

Growth of enterprises is associated with entrepreneurial competencies (Hoffman, 2013). According to Kirzner (2013). entrepreneurial competencies are associated with beliefs, personality, knowledge, skills, attitude, enterprise and behavioural tendencies. Man and Lan (2013) allude that entrepreneurs competencies can be classified into opportunity, organization, strategic, relationship, conceptual and commitment competencies. McClleland (2014) argue that success among enterprises is dependent on their capacity to identify and take advantage of available opportunities. Further, there is need for deployment of

management capabilities that would lead in development of key strategic pillars. According to Henry (2014) a firm must have strategic vision, goals and objectives that would optimize the odds of its survival and position of its optimal service to its target market niche.

2.3.3 Regulatory Environment and Access to Credit

Success of an economy is contingent to strong financial sectors that promotes fund transfer and distribution of financial services (Driga & Dura, 2014). Traditionally, this role had been reserved among banks who were perceived as distributors of financial services this is possible through gathering of information about borrowers and lenders. Providers of financial services ought to be stable and be efficient providers of financial services which would be achievable courtesy of legal, economic and political environment (Driga & Dura, 2014). Traditionally, financial services were mostly provided by banks and were customized to respond to their customers' demands and needs. Bank provide services such as payments, transfer of funds, foreign exchange transactions, financial advisory, safe deposit and bill of finance.

Business regulation and supervision lays foundation on how financial institutions conducts their businesses. According to Mathenge (2007) business regulation enhances information disclosure, compliance with professional ethics, competency in provision of services and marketing of organization products. Business code of conduct provides guidance on management of principal agent relationship. This would be possible if all stakeholders would have equal information access and have clarity of expected code of conduct while dealing with customers.

Digital cash services in Kenya, started in 2007 after M-pesa innovation by Safaricom. M-Pesa was positively received by at least 90% of Safaricom market share. According to Mas (2011) the product is in high demand among customers since it accorded efficiency and convenience among customers. The innovation was timely since despite of many people accessing cell phones they had no access to debit cards, there was unequal distribution of banking services, poor physical infrastructure deterred banks from expanding their branch networks, huge rural population that was not banked and lack of alternative credit provision platforms.

Digital cash transfer platforms can be easily deployed in huge population since they are propelled through technological platforms. According to Chuen (2015) reliance of exiting Safaricom platform would minimize start-up capital and save on time required to develop infrastructural network. Moreover, fintech is easier to adopt whenever there is a clear technology that can address the market need. Furthermore, it can easily penetrate the market thus, easily fulfils unmet market need. According to Mwega (2014) M-Pesa easily penetrated the market since it was recognized by Central Bank of Kenya and accorded lighter regulations upon being recognized as non-banking service. At initial phase of M-Pesa it was excluded from stringent regulation but upon expansion it has been accorded requisite legal requirements. This faster regulation is similar to regulation accorded to peer-to-peer lending in China. It's through financial regulations that investors and consumers' confidence is boosted and security of their finance is assured.

2.4 Summary of the Literature and Gaps

Musyoka (2013) evaluated financial innovation and performance of insurance companies. Financial innovation was hailed as a mechanism of reducing administrative transaction, service and productivity. Innovations were achieved through formation of strategic alliances, increased branch networks and customized institutional innovations. Muteke (2015) reported marginal contribution of institutional, process and product innovation on performance of savings and credit cooperative societies. Kojo and Yazidu (2015) established that product innovation has relationship with performance of microfinance institutions. Atieno (2014) reported that micro finance innovations have influence on access on finance on access on finance by small and medium enterprises. Koech and Makori (2014) revealed that innovation have influence on competitive advantage. Innovation was credited with contribution of flexibility in banking process.

Mobile phones have been adopted as an effective tool for provision banking services (Mishra & Bisht, 2013). Mobile penetration has been hailed as the most effective tool for financial inclusion and deepening. According to Asongu (2016) mobile phone infrastructure and inclusivity has been hailed with sustainability of growth in the financial sector. Success of financial innovation is contingent to quality of regulation in place. In Kenya peer to peer lending are not regulated since traditional banking model has persistently dominated the market (Klein & Mayer, 2011). Furthermore, Swarmy (2010) allude that poorly timed and ill-conceived polices has implications on achievement of financial inclusion and deepening in an economy.

2.5 Conceptual Framework

A conceptual framework is a schematic framework showing the link between variables under examination. In the current study digital financing is operationalized as digital finance infrastructure, digital finance ecosystem and regulatory environment. Digital finance infrastructure was operationalized as mobile subscription density, internet density, electricity coverage and grid reliability. Digital finance ecosystem was operationalized as start-up attractiveness. Regulatory environment was operationalized as political instability, strength of legal rights and corruption. Access to credit was operationalized as changes in amount of credit accessed. Figure 2.1 shows the conceptual framework.

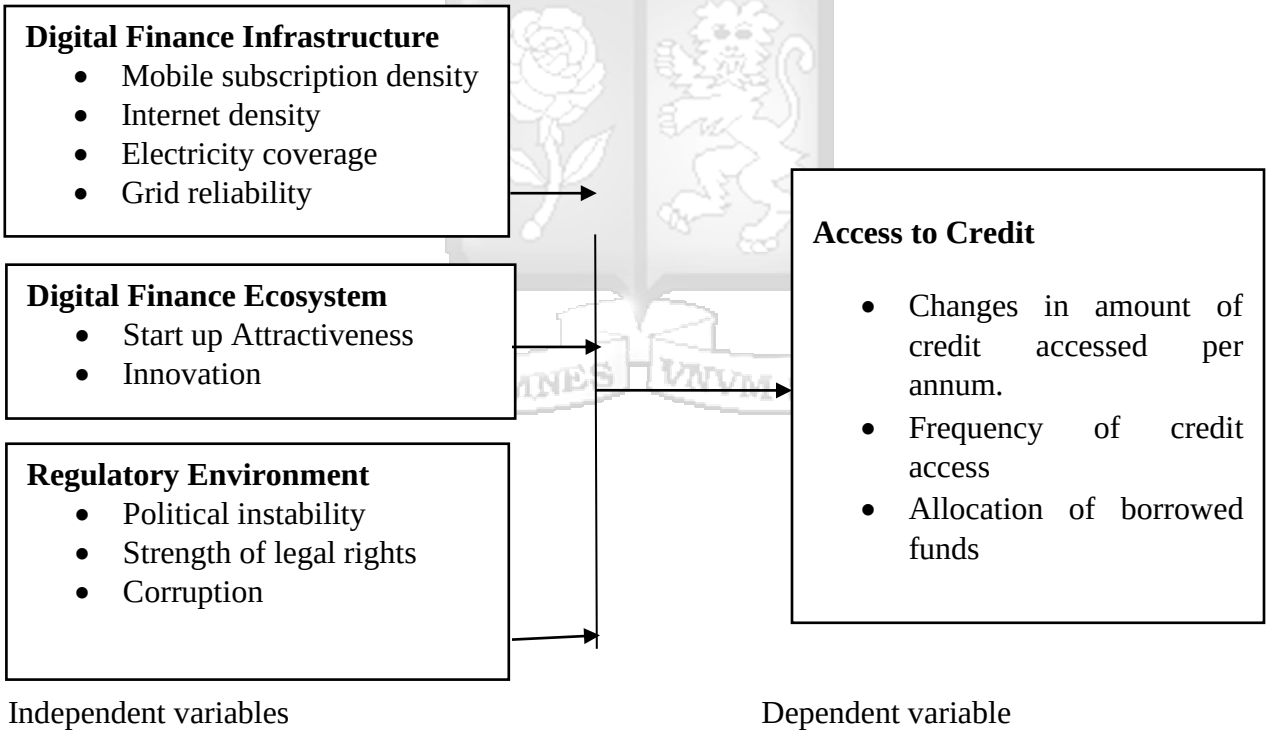


Figure 2.1 Conceptual Framework

Table 2.1 Operationalization of Variables

Variable	Attributes	Scale	Data Analysis	Supporting theory	Supporting literature
Digital finance infrastructure	Mobile subscription density Internet density Electricity coverage Grid reliability	5-point Likert scale	Descriptive statistics, correlation & Regression	Diffusion of innovation model	Anderson, et al., 2017; Karlan & Zinman, 2010; Noruzy et al., 2013; Ahmed (2013)
Digital finance ecosystem	Startup attractiveness Innovation	5-point Likert scale	Descriptive statistics, correlation & Regression	Diffusion of innovation model	Ekmekcioglu & Barak, 2012; Kama and Adigun (2013); Dupas and Robisson (2009)
Regulatory environment	Political instability Strength of legal rights Corruption	5-point Likert scale	Descriptive statistics, correlation & Regression	Supply leading hypothesis	Driga & Dura, 2014; Mas (2011); Chuen (2015)
Access to credit	Changes in amount of credit accessed p.a Frequency of credit access Allocation of borrowed funds	5-point Likert scale	Descriptive statistics		

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The current chapter discusses the methodology that was employed in the study. The key aspects being discussed in the current chapter are research design, sampling procedure and sample size, data collection instruments and data analysis.

3.2 Research Philosophy

This is a belief about the way in which data about a phenomenon should be gathered, analysed and used. It is the foundation of knowledge which assists the researcher to expose, understand and minimize research biases (Sekaran & Bougie, 2013). In determining the research philosophy to adopt, a researcher considers the epistemology and ontology of the paradigm. Three epistemological considerations exist in social sciences which include the positivism, post positivism/ realism and the constructivism /interpretivism (Saunders, Lewis & Thornhill, 2014). Ontology is concerned with the form and nature of reality and what there is to be known about it.

This study was based on the paradigm of positivism because the ontology of positivism paradigm states that reality is real and apprehensible, where the collection and analysis of data enables the testing of theories and proving hypotheses. Further, positivistic philosophical foundation is based on real facts, objectivity, neutrality, measurement and validity of results (Saunders, et al., 2014). Further, positivism philosophy maintains that

knowledge should be based on facts and no abstractions, thus knowledge is predicated on observations and experiments.

3.3 Research Design

According to Kombo and Tromp (2006) a research design can be defined as a guideline showing how the research was carried and the necessary measures which ought to be in place so as to fully control all adverse factors which can influence the output. In addition, Cooper and Schindler (2014) posited that through research design a researcher is able to plan on how to attain research objectives with minimum variation of the output. Moreover, participants activities may be real as manifested by their conducts in real life activities and it can be possible to gather in depth data of the people (Sekeran & Bougie, 2013). The likelihood of study success is dependent on clarification of research goals and objectives, availability of sufficient literature in the study area, accessibility of study information sources and capacity to criticize and identify research gaps in existing literature (Coopers & Schnidler, 2014).

Descriptive correlational research design was adopted in the current study. Oso and Onen (2009) defined descriptive design as a design primarily aimed at describing the situation with key responses on when, how and why in relation to items of interest. The strengths of descriptive research design are that the research can carry out the study without inferring participants activities, participants may exhibit their real behaviours, there are higher chances of obtaining much information since those participating in the study may freely provide it.

3.4 Target Population

According to Saunders et al., (2014) study target population refers to a complete enumeration of the set of individuals with homogenous characteristics under consideration. Population of the study comprised of 2,157 farmers who were drawn from Mitooini II irrigation farmers' cooperative society, Karia irrigation farmers' cooperative society, Rwama farmers' cooperative society, Kandiu irrigation farmers' cooperative society, Kithumbu farmers' cooperative society and Kibirigwi farmers' cooperative society. The cooperatives were identified in collaboration with the Ministry of Cooperative and Trade in Kirinyaga County. The farmers were selected to since they may have relied on digital platforms to access finance. The population is as shown in the matrix below.

Table 3.1 Target Population

Farmers' Cooperative Society	Number of Farmers	Percentage
Mitooni II irrigation	400	19
Karia irrigation	307	14
Rwama	252	12
Kandiu	400	19
Kithumbu	200	9
Kibirigwi	598	28
Total	**2157**	**100**

3.5 Sampling Design and Sample Size

Sampling refers to the process of selecting a subset of the target population (Oso & Onen, 2009). Sampling can be probabilistic or non-probabilistic. According to Sekaran and Bougie (2013) the choice between the two is mutually exclusive and non-probabilistic is deployed when there are clearly defined inclusion and exclusion criteria of respondents. In

probabilistic sampling criterion all respondents have equal chances of inclusion (Saunders, et al., 2014). The sampling frame will be generated from a list of farmers hailing from cooperative societies in Kirinyiga County. Simple random sampling was used and sample size will be determined through use of Yamane formula (Yamane, 1967).

$$\mathbf{n} = \frac{N}{1+N(e^2)}$$

Where: n = required sample size
N = Target population

e = margin of error at 0.05% (standard value of 0.10)

Therefore, the sample size was,

$$n = \frac{2157}{1+2157(0.05^2)} = 338.$$

The sample was distributed as follows in three hubs in Kirinyaga County as in Table 3.2:

Table 3.2 Sample Size

Farmers' Cooperative Society	Number of Farmers	Percentage
Mitooni II irrigation	63	19
Karia irrigation	48	14
Rwama	39	12
Kandiu	63	19
Kithumbu	31	9
Kibirigwi	94	28
Total	**338**	**100**

3.6 Data Collection Instruments

Questionnaires were used to collect primary data. Data collection instruments are tools adopted in research for gathering of the required information (Bryman & Bell, 2015).

Further, Sekaran and Bougie (2013) asserts that a questionnaire is dominant in social sciences since it is easy to administer, can be issued through online platforms, drop and pick approaches and it does not always require a research assistant for its administration.

The questionnaire for the study had three parts; part one sought for background information, part digital financing and the last part on access to credit among farmers in Kirinyaga County. Nominal scale was adopted in the background section and five-point Likert scale were applied in examination of the effect of digital financing on access to credit among farmers in Kirinyaga County.

3.7 Piloting

Sekaran and Bougie (2013) asserts that piloting of research instrument is necessary so as to evaluate the reliability and validity of research instrument as well as its capacity to achieve the research objectives. Through piloting Saunders et al., (2014) argues that weakness and strengths of the research instrument can be easily examined. Piloting of the research instrument was carried out in Nyeri County that neighbours Kirinyaga County and share agriculture as the main economic activity. According to Kothari (2011) piloting should be carried out in at least 10% of the sample size. Thus, in the study piloting was carried among 28 farmers who will be drawn from different projects in Nyeri County.

3.8 Data Analysis

Data collected was quantitatively analyzed through use of Statistical Packages for Social Scientists (SPSS, 23). The background information of the respondents were analysed using

descriptive statistics. According to Sekaran & Bougie (2013) descriptive statistics are statistical tools used to summarize large volumes of data with very few figures.

Descriptive statistics adopted in the study include mean, percentage, frequency and standard deviation. The mean shows the central tendency of the data, the standard deviation measures the dispersion which offers an index of the spread or variability in the data (Sekaran & Bougie, 2013). In other words, a small standard deviation for a set of values reveals that these values are clustered closely about the mean or located close to it; a large standard deviation indicates the opposite.

Exploratory factors analysis (EFA) was carried out to establish the degree of correlation amongst several attributes of study variables. According to Hair, Black, Babin, Anderson and Tatham (2010), attributes with factors loadings exceeding 30% should be retained for subsequent analysis. Though the highly recommended factor loadings threshold is 70% it is difficult to attain in real life situations and consequently empirical scholars have consistently used a range of 0.4 to 0.7 to retain attributes for subsequent analysis.

Inferential statistics to be adopted in the study include Spearman's rank correlation and multiple ordinal regression analysis. Spearman's rank correlation analysis examines the strength of the effect of digital financing on access to credit. Further, multiple regression examined the nature of the effect of digital financing on access to credit in Kirinyaga County. Spearman's rank was used since the variables were measured in ordinal scale of measurement. Spearman's rank correlation was measured using correlation coefficient that will range from +1 to -1. A coefficient of +1, indicates perfect relationship between

independent and dependent variables. A coefficient of -1 indicate inverse effect of independent on dependent variables. A coefficient of 0, indicates that there is no relationship between independent and dependent variables (Sekaran & Bougie, 2013). Ordered regression model was applied and the control effect of gender, age, marital status and education level on access to credit. Ordered logit was applied since the access to credit, digital fintech infrastructure, digital fintech ecosystem, regulatory environment and access to credit were in ordinal scale while gender, marital status, age and education level were categorical. Regression model was of the form:

$$\text{Logit } (Yi) = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + €$$

Y = Access to credit

X_1 = Fintech infrastructure

X_2 = Fintech ecosystem

X_3= Regulatory environment

X_4 = Gender

X_5 = Age

X_6= Marital status

X_7= Education level

α = y intercept, the value of access to credit when all factors are zero.

3.9 Diagnostic Tests

Ordered logit regression modelling is anchored on four main assumptions that states that dependent variable should be ordered, at least one or more predictor variable can be continuous, categorical or ordinal. Thirdly, predictor variables should not be affected by multicollinearity and parallel regression ought to have similar coefficients. Currently, access to credit, digital fintech infrastructure, digital ecosystem and regulatory environment were measured in a five-point likert scale that ranged from strongly disagree, disagree, neutral, agree to strongly agree. Control variables which were gender, age, marital status and education level were categorical. Multicollinearity was examined using Spearman's rank correlation and if it may be greater than 0.8 between two predictor variables then multicollinearity is an issue and consequently model respectification ought to be carried out. The test for uniformity of parallel regression coefficients was carried out with a null hypothesis that there were the same against an alternative that there differed.

3.10 Research Quality

3.10.1 Validity of the Research Instrument

Validity examination is an examination of the research instrument to ensure that it measures what it is expected to. Sekaran and Bougie (2013) that validity is the level in which research tools evaluates what it purports to be measuring. Validity can be broadly classified into face validity, content validity, criterion validity and discriminant validity. Face validity is actual appearance of research instrument to measure items of interest. Its main drawbacks are; its anchorage on people institution while evaluating their conduct and some known research

tools can be modified and adopted in subsequent studies (Saunders et al., 2014). Face validity will be examined through comparison of research instrument with tools adopted by past studies.

Content validity is ability of research instrument to cover what it was intended to. Its main drawback is inability to evaluate its relevance quantitatively hence subjecting it subjective examination (Sekaran & Bougie, 2013). Content validation of the research tool will be examined by discussion of the research tool with experts who may guide in evaluating inclusion of all attributes that ought to be considered in a study. Criterion validity is examination of similar in scoring as per known criterions. In discriminant validity there is no conformity in responses from heterogeneous group (Cooper & Schnidler, 2014).

3.10.2 Reliability of the Research Instrument

According to Oso and Onen (2009) a research instrument is said to be valid if it yields similar results after repeated number of trials. Cronbach's alpha was used as an internal consistency reliability test, Saunders et al., (2014) argues that the method is appropriate if every component instrument is measured by more than one response. Reliability is the test of the likelihood of achieving similar findings if research instrument is administered in different groups (Oso & Onen, 2009). Also, it is the ability of research instrument to yield stable results.

Cronbach's alpha a coefficient was used to test for reliability. According to Kothari (2011) Cronbach's alpha is a coefficient of reliability that gives an unbiased estimate of data generalizability. An alpha coefficient higher than 0.70 indicates that the gathered data has a

relatively high internal consistency and could be generalized to reflect opinions of all respondents in the target population. After obtaining an alpha coefficient of higher than 0.70, questionnaires were then issued to the respondents. Results in Table 3.3 indicates that all reliability coefficients were reliable since the highest was 0.786 for access to credit and the least 0.745 for digital fintech infrastructure.

Table 3.3 Reliability Analysis

Variable	Number of Items	Cronbach Alpha Coefficient	Decision
Digital fintech infrastructure	6	0.745	Accepted
Digital fintech ecosystem	8	0.763	Accepted
Regulatory environment	8	0.752	Accepted
Access to credit	5	0.786	Accepted

3.11 Ethical Consideration

Cover letters was affixed to the questionnaires provided explaining the nature of the study and assuring the respondents confidentiality provided. The respondents were also be given instructions on how the questionnaires were completed and returned. The rationale behind this is to help reduce the likelihood of obtaining biased responses. The respondent's name was not be captured in any section of the questionnaire.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.1 Introduction

This chapter presents the findings gathered from the respondents. The first section presents the response rate followed by demographic information, descriptive analysis and inferential statistics.

4.2 Response Rate

The selected sample was 338 respondents where all respondents were issued with questionnaires for data collection. Out of 338 questionnaires, 206 questionnaires were dully filled. This formed a response rate of 61% of which according to Mugenda is sufficient for statistical analysis since he indicated that a 50% rate is sufficient and 60% is good. Therefore, a response rate of 61% was sufficient for analysis and reporting. The response rate was enhanced through prior communication and visit to respective cooperative society offices upon which data was mined that aided in data collection through use of google forms.

Table 4.1 Response Rate

Questionnaires	Frequency	Percent
Returned	206	61
Un-returned	132	39
Total	**338**	**100**

4.3 Demographic Information

The study sought demographic information of gender, age, marital status and religious. Results in Table 4.2 indicates that 50.5% of respondents were female and 49.5% were male. Regarding age distribution, 44.2% aged 36 to 45 years, 29.6% aged 31 to 35 years and 13.6% aged 26 to 30 years while there were only 2.4% who aged between 18 to 25 years. Concerning education levels, 41.3% were secondary school graduates and 13.6% had university qualifications.

Table 4.2 Demographic Information

		Frequency	Percent
Gender	Male	102	49.5
	Female	104	50.5
Age	18-25	5	2.4
	26-30	28	13.6
	31-35	61	29.6
	36-45	91	44.2
	46-60	21	10.2
Marital status	Married	167	81.1
	Separated/divorced	5	2.4
	Single	26	12.6
	Widow/widower	8	3.9
Education level	College	57	27.7
	Postgraduate	2	1
	Primary	34	16.5
	Secondary	85	41.3
	Undergraduate	28	13.6
	Total	**206**	**100**

4.4 Descriptive Statistics

Descriptive statistics that include mean, median, standard deviation was applied to analyze the data. Respective findings are summarized as shown.

4.4.1 Descriptive Statistics on Digital Finance Infrastructure

The first objective of the study examined the effect of digital finance infrastructure on access of finance. Results in Table 4.3 indicates that majority agreed (mean = 4.2) agreed that access of financial services through USSD aids in financial access. Secondly, majority agreed (mean = 4.4) that they have options of accessing internet that aids in digital financing. Thirdly, majority agreed (mean = 4.4) that their region has reliable internet that aids on digital financial access. Further, majority agreed (mean = 4.1) either reliability of internet aid in access of digital finance or non-intermittent digital finance platform aid in access of credit. In addition, agreed (mean = 3.9) that ease of use of mobile lending platform aids in digital finance access.

Table 4.3 Descriptive Statistics on Digital Finance Infrastructure

	n	Mean	Std. Dev
Access of financial services through USSD aids in financial access	206	4.2	0.6
We have options of accessing internet that aids in digital financing	206	4.4	0.6
Our region has reliable internet that aids on digital financial access	206	4.4	0.6
Reliability of internet aid in access of digital finance	206	4.1	0.7
Non-intermittent digital finance platform aid in access of credit	206	4.1	0.7
Ease of use of mobile lending platforms aids in digital finance access	206	3.9	0.4
Overall average		**4.2**	**0.6**

4.4.2 Descriptive Statistics on Digital Finance Ecosystem

The second objective of the study examined the effect of digital finance ecosystem on access to credit. Results in Table 4.4, majority agreed (mean =3.9) that ease of use of mobile lending platforms aids in digital finance access. Secondly, majority mean =4.3 agreed ease of transactions in digital platforms aids in digital financing. Further, mean =4.4 agreed relational attributes in digital financial platforms aids in financial access. Moreover, mean = 4.4 agreed that agreed that ideological features of digital lending platforms aid in provision of financing services. In addition, mean = 4.0 agreed that innovativeness of digital financial services providers aids in financial inclusion. Furthermore, mean=4.3 agreed that proactiveness of digital financing aids in financial inclusion. Finally, mean = 4.3 agreed that risk taking of digital lenders aid in access of financial services.

Table 4.4 Descriptive Statistics on Digital Finance Ecosystem

	n	Mean	Std. Dev
Ease of use of mobile lending platforms aids in digital finance access	206	3.9	0.4
Ease of transaction in digital platforms aids in digital financing	206	4.3	0.7
Relational attributes in digital financing platforms aids in financial access	206	4.4	0.6
Ideological features of digital lending platforms aid in provision of financial services	206	4.4	0.6
Innovativeness of digital financial services providers aids in financial inclusion	206	4.0	0.8
Proactiveness of digital financing aids in financial inclusion	206	4.3	0.6
Risk taking of digital lenders aid in access of financial services	206	4.3	0.6
Average		**4.2**	**0.6**

4.4.3 Descriptive Statistics on Regulatory Environment

The third objective studied the effect of regulatory environment on access of finance. Results in Table 4.5 indicates that mean = 4.0 agreed that the state of political stability in their region have created demand for financial services. Secondly, mean =4.4 agreed that legal requirement of digital lenders has effect on access to digital finance. Further, mean =4.3 agreed that some digital financing apps are unreliable due to changes in regulations. In addition, mean = 4.4 agreed that digital financing has led to changes in mobile financing services legislations. Moreover, mean =4.0 agreed that digital financing has positive contribution in financing liberalization. There was an agreement mean = 4.3 that digital financing has led to clarity of financial rules and regulations. There is need for agricultural subsidies since mean = 4.2 agreed that lack of agricultural subsidies has led to use of digital financing. In addition, mean = 3.9 agreed that sporadic agricultural sector regulations have led to use of digital financing.

Table 4.5 Descriptive Statistics on Regulatory Environment

	n	Mean	Std. Dev
The state of political stability in our region have created demand for financial services	206	4.0	0.3
Legal requirement of digital lenders has effect on access to digital finance	206	4.4	0.5
Some digital financing apps are unreliable due to changes in regulations	206	4.3	0.6
Digital financing has led to changes in mobile financing services legislations	206	4.4	0.5
Digital financing has positive contribution on financial liberalization	206	4.3	0.5
Digital financing has led to clarity of financial rules and obligations	206	4.0	0.7
Lack of agricultural subsidies have led to use of digital financing	206	4.2	0.6

Sporadic agricultural sector regulations have led to use of digital financing	206	3.9	0.4
Overall average		**4.2**	**0.5**

4.4.4 Descriptive Statistics on Access to Credit

An examination on the access of credit in Table 4.6 indicates that majority mean = 4.1 agreed that through digital financing they can access finance promptly. Secondly, mean 4.3, agreed that through digital financing they have managed to develop credit history. Further, there was an agreement (mean = 4.4) that either credit repayment patterns aid an individual in accessing more credit or planning on how to spend money aids in repayment of borrowed funds. Finally, mean = 4.2, agreed that they always ensure borrowed funds are allocated to intended needs.

Table 4.6 Descriptive Statistics on Access to Credit

	n	Mean	Std. Dev
Through digital financing I can access finance promptly	206	4.1	0.4
Through digital financing I have managed to develop my credit history	206	4.3	0.6
Credit repayment patterns aids me in accessing more credit	206	4.4	0.6
To aid on credit repayment I plan on how to invest borrowed funds	206	4.4	0.6
I always ensure borrowed funds are allocated to intended needs	206	4.2	0.6
Overall average		**4.3**	**0.6**

4.5 Exploratory Factor Analysis

From the exploratory factor analysis results in Table 4.6 digital financing has led to clarity of financial rules obligations has the highest factor loading of 0.555 followed by legal requirement for digital lenders with a factor loading of 0.533 and digital lending has an implication on financial liberalization has a factor loading of 0.571. Further, proactiveness of digital financing aids in financial inclusion has a factor loading of 0.508 and innovativeness having effect on financial inclusion has a factor loading of 0.537. The four extracted factors accounted for 55%.

Table 4.7 Exploratory Factor Analysis

	1	2	3	4
Digital financing has led to clarity of financial rules and obligations	0.555			
Legal requirement of digital lenders has effect on access to digital finance	0.533			
Relational attributes in digital financing platforms aids in financial access	0.45			
Digital financing has led to changes in mobile financing services legislations	0.434			
Through digital financing I have managed to develop my credit history	0.428			
Digital financing has positive contribution on financial liberalization		0.571		
Our region has reliable internet that aids on digital financial access		0.518		
I always ensure borrowed funds are allocated to intended needs		0.401		
To aid on credit repayment I plan on how to invest borrowed funds			0.517	
Proactiveness of digital financing aids in financial inclusion			0.508	
Reliability of internet aid in access of digital finance			0.478	
Non-intermittent digital finance platform aid in access of credit			0.401	
Innovativeness of digital financial services providers aids in financial inclusion				0.537

Through digital financing I can access finance promptly	0.467
Sporadic agricultural sector regulations have led to use of digital financing	0.42
Some digital financing apps are unreliable due to changes in regulations	0.418
Total variance explained	54.99%

4.6 Spearman's Correlation Analysis

Spearman's rank correlation coefficient was applied to examine the strength of the effect of access to credit and digital fintech ecosystem, digital fintech infrastructure and regulatory environment. Results in Table 4.8 indicate that there was a positive and significant effect between digital finance infrastructure and access to credit (rho = 0.611, p value < 0.05). Secondly, there was a positive effect of digital fintech ecosystem and access to credit (rho = 0.597, p value < 0.05). Thirdly, regulatory environment has positive and significant effect with access to credit (rho = 0.672, p value < 0.05). There was no multicollinearity among independent variables since none of them had correlation coefficient greater than 0.7.

Table 4.8 Spearman's Rank Correlation Analysis

	1	**2**	**3**	**4**	**5**	**6**	**7**
Access to credit (1)	1	.614**	.578**	.575**	0.036	0.047	-0.079
		0.000	0.000	0.000	0.608	0.505	0.259
		206	206	206	206	206	206
Fintech Infrastructure (2)		1	.583**	.516**	-0.028	-0.011	-0.036
			0.000	0.000	0.693	0.874	0.612
			206	206	206	206	206
Fintech Ecosystem (3)			1	.614**	-0.013	-0.007	-0.087
				0.000	0.858	0.924	0.216
				206	206	206	206
Regulatory Environment (4)				1	-0.057	0.026	-0.061
					0.416	0.708	0.385
					206	206	206
Age (5)					1	-.235**	0.02
						0.001	0.777

	206	206
Marital status (6)	1	-.254**
		0.000
		206
Education level (7)		1

** (p value < 0.05)

4.7 Diagnostic Test

Results in Table 4.9, indicates that there was no enough evidence to support rejection of the null hypothesis that parallel regressions have different slope coefficients since none of the test had p value less than 0.05. Hence, it can be concluded the most to examine effect of digital fintech ecosystem, digital fintech infrastructure and regulatory environment on access to credit among farmers in Kirinyaga County.

Table 4.9 Diagnostic Test

Test	Chi square	Df	P value
Wolfe Gould	16.68	9	0.542
Brant	21.86	9	0.054
Score	25.49	9	0.362
Likelihood ratio	18.81	9	0.632
Wald	19.62	9	0.620

4.8 Ordinal Regression Analysis

Simple ordinal regression analysis was carried out to examine the examine the effect of respective predictor on access to credit and multiple regression evaluated joint effect of fintech infrastructure, fintech ecosystem and regulatory environment on access to credit. In model 1 the final likelihood is -272.22, likelihood chi square of 12.06 and p value of 0.000. Thus, there is a significant prediction of digital fintech infrastructure while compared with a

model with nil predictors. Digital fintech infrastructure has positive and significant effect on access of credit among farmers in Kirinyaga County. Hence, we can conclude that unit increase in digital fintech infrastructure increases by 0.5 in the log odds of access to credit.

In model 2 the final likelihood is -272.80, likelihood chi square of 12.90 and p value of 0.000. Thus, there is a significant prediction of digital fintech ecosystem while compared with a model with nil predictors. Digital fintech ecosystem has positive and significant effect on access of credit among farmers in Kirinyaga County. Hence, we can conclude that unit increase in digital fintech ecosystem increases by 0.345 in the log odds of access to credit.

In model 3 the final likelihood is -273.18, likelihood chi square of 13.24 and p value of 0.000. Thus, there is a significant prediction of regulatory environment while compared with a model with nil predictors. Regulatory environment has positive and significant effect on access of credit among farmers in Kirinyaga County. Hence, we can conclude that unit increase in regulatory environment increases by 0.122 in the log odds of access to credit. In model four and five all predictors and control variables have positive and significant effect on access to credit. Hence, an increase in each of them increased the logs for access of credit.

Table 4.10 Ordered Logit Regression Analysis

	Access to Credit				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Digital fintech infrastructure	0.5 (.205)**			.504(.235)**	.624(.224)**
Digital fintech ecosystem		.345 (.117)**		.347(.148)**	.369(.123)**
Regulatory environment			.122(.052)**	.057(.020)**	.048(.023)**
Gender					.047(.022)**
Age					.004(.002)**
Marital status					.574(.185)**
Education level					.16 (.056)**
Cut1	5.07 (1.50)	4.42(1.55)	3.49 (1.45)	6.77 (2.46)	7.81 (2.58)
Cut2	3.36 (1.47)	2.71 (1.52)	1.79 (1.42)	5.06 (2.43)	6.03 (2.55)
Cut3	2.65 (1.46)	2.00 (1.51)	1.07 (1.42)	4.34 (2.43)	5.25 (2.55)
Cut4	.09 (1.46)	.55 (1.51)	1.47 (1.43)	1.78 (2.42)	2.55 (2.53)
Log likelihood	-272.22	-272.80	-273.18	-271.730	-263.36
LR chi square	12.06	12.90	13.24	33.30	19.78
P value	0.000	0.0000	0.0000	0.000	.0001
Pseudo' R^2	.038	0.026	0.045	.2550	.3641

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter is a presentation of study findings summary and conclusion from the findings highlighted and recommendations based on the findings gathered from the respondents. Conclusions and recommendations drawn were focussed on addressing the objectives of the study.

5.2 Discussion

The study aimed at addressing heterogeneous gaps that arose from theoretical, conceptual, contextual and methodological aspects. The primary purpose of the study was to examine the effect of digital financing on farmers access to credit in Kirinyaga County. The study specifically, examined the effect of digital financial infrastructure, digital financial ecosystem and regulatory environment on access to credit. Descriptive research design was applied and primary data sourced through administration of questionnaires. The study applied descriptive and inferential statistics to analyze the data. Results of the study revealed positive and significant effect of digital finance infrastructure, digital financial ecosystem and regulatory environment on access to credit among farmers in Kirinyaga County.

5.2.1 Digital Fintech Infrastructure and Access to Credit

The first objective of the study of the study indicated that there was a positive and significant effect of digital fintech infrastructure and access to credit. The results of the study are in agreement with Suri et al., (2019) who reported that ICT are tools of enhancing economic importance. This was in agreement with Karlan and Zinman (2010) who reported that information technology enhances information sharing, coordination and quality improvement. Further, Ekmekcioglu and Barak (2012) who alluded that ICT lowers operational costs and enhance organization performance through new market penetration. Moreover, Odhiambo (2011) argued that financial liberalization would enhance positive contribution on economic growth.

The study established that through digital financing farmers can easily access credit as opposed to accessing credit from financial institutions such as commercial banks in the country. The study also found out that digital loans are essential for farmers' credit accessibility needs since it much easier to access it through digital lending platforms. In addition, it was established that digital loan qualification is not pegged on possession of a bank account, that is farmers are not required to open a bank account for them to access credit through digital lending platforms. The study findings concur with that of Kama and Adigun (2013) who indicate that financial inclusion is possible through infrastructure adequacy and efficiency of technology development. The study found out that acquisition of mobile phone that supports mobile lending apps aids in financial access.

These findings concur with that Ekmekcioglu and Barak (2012) revealed that that financial ecosystem has metamorphosized and developed new financial products and alternative means for provision of financial services in non-traditional platforms. Notable financial innovations deployed by financial institutions include mobile banking, agency banking, credit cards, paperless banking, payroll management among others. These financial innovations have been hailed as sources of financial inclusion. Adoption of mobile money has enhanced access to financial services. Moreover, these innovations have significant contribution to inclusion of excluded rural population. The findings also revealed that, reliability of internet connection plays an essential role in accessing digital finance.

5.2.2 Digital Fintech Ecosystem and Access to Credit

The second objective of the study reported positive and significant effect of digital fintech ecosystem and access to credit. The findings were in support of Ekmekcioglu and Barak (2012) alluded, financial innovations by financial institutions aids in financial intermediation efficiency. These findings were in support of Andianaiyo and Kpodar (2011) who argues that financial inclusion is achievable through mobile banking innovation. Further, Salim and Sulaiman (2011) argue that organization innovation acts as a source of competitive advantage. This in tandem with Boache-Menshand (2013) who asserts that at least 50% of performance is attributed to innovation. Furthermore, Nader (2011) asserts that profit efficiency is linked to incorporation of mobile banking owing to its level of penetration.

This study established that there is a significant relationship between fintech ecosystem and access to credit. The findings revealed that ease of use of mobile lending platforms enhances

accessibility of digital finance. The findings also revealed that innovativeness of digital financial services providers enhances financial inclusion. The findings showed that the ease of transaction in digital platforms aids digital financing. Further, the findings are in support of diffusion of innovation model that alludes that innovative technological approaches have disrupted traditional business models. This has impacted significantly in access to credit, supply has been bridged surplus saving units while demand side has responded on the needs of deficit saving unit.

5.2.3 Regulatory Environment and Access to Credit

The third objective of the study revealed positive and significant effect of regulatory environment on access to credit. The findings are in agreement with Driga and Dura (2014) who alluded that strong financial sector amplifies transfer and distribution of financial services. Further, Mathenge (2007) alludes that through business regulation the level of information disclosure, compliance with professional ethics and competency in provision of services and marketing are contingencies of achievement of organization objectives. Moreover, Mwega (2014) allude that the penetration of M-pesa in Kenya was amplified by financial liberalization.

The study established that legal requirement for digital lenders influences credit accessibility. These findings are in line with Noruzy et,al (2013) who indicated that financial deepening is credited to the yolk of functionality of economic system and support of a solid legal framework. The authors further revealed that financial liberalization perceive that increased

interest rates because of legal requirements would mobilize resources and support innovation to enhance financial services provision to unbanked set.

5.3 Conclusion

The first objective of the study sought to determine the effect of fintech infrastructure on credit access among farmers in Kirinyaga County. It was established that fintech infrastructure is statistically significant to credit accessibility. The study therefore concludes that a unit increase in fintech infrastructure would result in an increase of credit accessibility among farmers in Kirinyaga County.

Furthermore, the study sought to determine the effect of fintech ecosystem on credit access among farmers in Kirinyaga County. This study established that there is a statistically significant relationship between fintech ecosystem and credit accessibility among farmers in Kirinyaga County. The study therefore concludes that a unit increase in fintech ecosystem would lead to an increase in credit accessibility among farmers in Kirinyaga County.

The last objective of this study sought to determine the effect of regulatory environment on credit access among farmers in Kirinyaga County. The findings established the existence of a significant and positive relationship between regulatory framework and access to credit. This study therefore concludes that a unit increase in regulatory framework would lead to an increase in access to credit among farmers in Kirinyaga County.

5.4 Recommendations

5.4.1 Practical Recommendations

This study revealed that an increase fintech infrastructure increases access to credit, The study therefore recommends digital lenders to ensure they are building a solid financial technology infrastructure to support access to credit among farmers. Digital lenders need to build an infrastructure that allows farmers to access credit in the most effective way possible, putting in a place a system that is easy to use and provides sufficient information to farmers regarding digital loans.

This study also established that an increase in financial ecosystem would result in an increase in access to credit among farmers. Therefore, this study recommends that digital lenders involve all stakeholders in financial technology sector to effectively deliver credit to farmers. Lastly, this study established that an increase in regulatory framework would lead to an increase in access to credit among farmers. The study therefore recommends that digital lenders should align their digital lending services with the existing regulations pertaining to lending in order to foster trust among farmers. Digital lenders should also provide clear terms for farmers before accessing loans and clearly define the responsibilities of both parties.

5.4.2 Policy Recommendations

Based on the study findings there is need for management of farmers cooperative societies in Kirinyaga County to develop customized digital financing products that may avail credit among themselves. Localized digital financial product may incorporate local dialect and mix

USSD code with google applications for ease of use among those who may not be conversant with complicated phones. There is need for indoctrination of financial literature programs among farmers so as to guide them on the most appropriate model for input and output analysis. The study therefore recommends management of digital lending financial institutions to innovate lending solutions that can be accessed easily through mobile devices used by most farmers. This would be crucial in increasing farmers' accessibility to credit as well as an opportunity for digital lenders to explore unexploited markets.

5.4.3 Areas for Further Studies

This study sought to determine the effect of digital financing on access to credit among farmers in Kirinyaga County. The study only targeted farmers in Kirinyaga County, therefore the study recommends replication of the study in different sectors such as Small and medium-sized enterprises. This study was also limited to four variables that is urgency of financial inclusion, fintech infrastructure, fintech ecosystem and regulatory environment. The current study was limited to use of primary quantitative data, there is need for subsequent studies to adopt mixed methods. Further, there is need for consideration of secondary data so as to examine long and short run effect of digital financing on access to credit. Stakeholders such a telecommunication companies, commercial banks, technology firms and the government should be involved in establishing a solid financial ecosystem that will help farmers in accessing credit while at the same time protecting their rights.

5.5 Limitations of the Study

The study context was farmers cooperative societies in Kirinyaga County thus the findings ought not to be generalized in any other sector. Thus, conclusions ought not to be drawn beyond the current unit of observations. In Kenya, farmers maybe grouped into cooperative societies that aids them to access financial support, though this may not deter them from pursuing finance from external sources. Influx of digital lending platforms may have precipitated access to financial services especially among the unbanked population. The study was limited to digital finance and access to credit. Digital finance was operationalized as digital finance infrastructure, digital finance ecosystem and regulatory environment. The study is limited to this definition whose contraction or expansion may vary study findings. Further, the study gathered quantitative data through administration of questionnaires. Quantitative data may fail to incorporate qualitative views that may have implications on the findings. Moreover, the study fitted ordered logit regression model that is anchored on restrictive assumptions. Despite of these assumptions the quality of study findings has not been diluted.

REFERENCES

Ahmed, A. D. (2013). Effects of financial liberalization on financial market development and economic performance of the SSA region: An empirical assessment. Economic Modelling, 30, 261–273.

Alliance for Financial Inclusion (2018). Digital transformation of microfinance and digitization of microfinance services to deepen financial inclusion in Africa. Retrieved from: https://www.afi-global.org

Andrianaivo, M. & Kpodar, K. (2011). ICT, Financial inclusion, and growth: Evidence from African countries. IMF Working paper WP/11/73. International Monetary Fund.

Asongu, S., & Odhiambo, N. M. (2019). Mobile banking usage, quality of growth, inequality and poverty in developing countries. *Information Development, 35*(2) 303–318.

Atieno, M. D. (2013). Effect of microfinance innovations on access to finance by Small and Medium Enterprises in Kenya: A Case of Microfinance Institutions in Kenya. Unpublished MBA project, University of Nairobi, Kenya.

Awuah, S.B. & Addaney, M. (2016). The interactions between microfinance institutions and Small and Medium Scale Enterprises in the Sunyani Municipality of Ghana. *Asian Development Policy Review, 4*(2), 51-64.

Batista, C., & Vincente, P. C. (2013). Introducing mobile money in rural Mozambique: Evidence from a field experiment, NOVAFRICA Working Paper 1301.

Bryman, A., & Bell, E. (2015). Business research methods. (4th Ed.). Upple. Malmö: Liber AB.

Cobla, G. M., & Osei-Assibey, E. (2018). Mobile money adoption and spending behaviour: the case of students in Ghana. *International Journal of Social Economics, 45*(1), 29–42.

Cooper, D. R., & Schindler, P. S. (2014). *Business research methods.* (12th Ed.). New York: McGraw-Hill/Irwin

Demirguic-Kunt, A., Leora Klapper, Dorothe Singer, Saniya Ansar and Jakes Hass. (2018). The Global Findex Database 2017: Measuring Financial Inclusion and Fintech Revolution. Washington, DC: World Bank

Derayah Financial Corp. (2017). A Concept Study on Peer-to-peer lending, October 2017. Retrieved on 5th April, 2021 from http://derayah.com

Dubey, R. & Gunasekaran, A. (2015). Education and training for successful career in Big Data and Business Analytics. *Industrial and Commercial Training, 47*(4),174-181.

Dupas, P. & Robinson, J. (2009). Savings Constraint and Micro enterprise development: Evidence from a field experiment in Kenya. NBER Working Paper 14693, National Bureau of Economic Research, Cambridge, MA.

Duvendack, M., & Mader, P. (2019). Impact of financial inclusion in low- and middle-income countries: a systematic review of reviews. Retrieved from https://www.researchgate.net

Fanta, A., & Makina, D. (2019). Extending Financial Inclusion in Africa. Oxford, UK: Academic Press.

Francis, E., Blumenstock, J., & Robinson, J. (2017). Digital credit: A snapshot of the current landscape and open research question. Retrieved from https://people.ucsc.edu

Greene, W.H. (2008). *Econometric analysis.* (6th Ed.). Pearson Prentice Hall, Upper Saddle River.

Gujarati, D. N. (2012). *Basic econometrics.* (4th Ed.). New York: Tata McGraw Hill.

Hoffmann, T. (2013). The meanings of competency. *European Journal of Industrial Training, 21*(5),262-282.

Hwang, B. & Tellez, C. (2016). The proliferation of digital credit deployment. Retrieved from https://www.cgap.org

Kaffenberger, M., Totolo, E., & Soursourian, M. (2018). A digital credit revolution -Insights from borrowers in Kenya and Tanzania. CGAP, Working Paper.

Kama. U & Adigun. M (2013). Financial inclusion in Nigeria: Issues and challenges. Central Bank of Nigeria, Abuja Nigeria.

Karlan, D., Kendall, J., Mann, R., Pande, R., Suri, T., & Zinman, J. (2016). Research and impact of digital financial services. The National Bureau of Economic Research. Retrieved from https://www.nber.org.

Kirzner, I. M. (2013). Entrepreneurial discovery and the competitive market process: an Austrian approach. *Journal of Economic Literature, 35*(13),60-85.

Kojo, I. H. S. D., & Yazidu, U. (2013). Financial characteristics and innovations in microfinance institutions in Ghana. *American Journal of Rural Development, 1*(3), 40-48.

Kojo, S. (2013). Exploring innovations in microfinance institutions in northern Ghana. *Business and Economic Research, 3*(1), 442-456.

Komarova, Y. & Gonzalez, L. (2015). Competition against common sense: insights on peer-to-peer lending as a tool to allay financial exclusion. *International Journal of Bank Marketing, 33*(5), 605-623.

Kombo, D.S., & Tromp, D. L. (2006). *Proposal and thesis writing.* An introduction. Nairobi: Paulines Publications Africa.

Kothari, C. R. (2011). *Research methodology. Methods and techniques*. New Age International Publishers. New Delhi. India.

Man, G. & Lau, E. (2013). Entrepreneurial competencies and the performance of SMEs in the Hong-Kong service sector. PhD dissertation. Hong Kong University.

Mugo, J. G. (2012). The effect of financial innovation on the growth of micro-finance Institutions in Kenya. Unpublished MBA project, University of Nairobi, Kenya.

Muteke, S. M. (2015). The relationship between financial innovation and financial performance among Savings and Credit Co-operatives Societies in Mombasa County, Kenya. Unpublished MBA Project, University of Nairobi, Kenya.

Muyoka, J. E. (2013). Relationship between financial innovations and financial performance of MFIS companies in Kenya. Unpublished MBA Project, University of Nairobi, Kenya.

Mwai, A., Njeru, A., & Memba, F. (2020). Moderating effect of bank size on relationship between financial innovation and financial deepening of listed commercial banks in Kenya. *American Based Journal, 8*(11), 16-28.

Ndungu, J., Morales, A., & Ndirangu, L. (2016). Cash in on the digital revolution. Financial Development. Retrieved from https://www.imf.org

Noruzy, A., Dalfard, V.M, Azhdari, B., Nazari-, S., & Rezazadeh, A. (2013). Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: An empirical investigation of manufacturing firms. *International Journal of Advanced Manufacturing and Technology, 6*(4), 1073- 1085.

Odhiambo, N. M. (2011). The impact of financial liberalization in developing countries: Experiences from four SADC countries. Addis Ababa: Organisation for Social Science Research in Eastern and Southern Africa.

Onay, C. & Öztürk, E. (2018). A review of credit scoring research in the age of big data. *Journal of Financial Regulation and Compliance, 26(*3),382-405.

Prashat, B., Jack, W., & Suri, T. (2019). Fintech and household resilience to shocks: Evidence from digital loans in Kenya. Retrieved from https://www.nber.org

Rogers, E.M. (2003). Diffusion of innovations (5th Ed.). New York: Free Press.

Rosli, M.M., Sidek, S. (2013). Innovation and firm performance. Evidence from Malaysian small and medium enterprises. University Malaysia Kelantan, Malaysia.

Runciman, B. & Gordon, K. (2014). Big data: Opportunities and challenges. Swindon, GB: BCS, The Chartered Institute for IT.

Salim, I. M., & Sulaiman, M. (2011). Impact of organizational innovation on firm performance. Evidence from Malaysian based ICT companies.

Sang, M. C., Zakayo, C., & Kibas, P. B. (2019). Influence of financial literacy on entrepreneurial performance among micro and small enterprises in Kericho County, Kenya. *International Journal of Economics, Commerce and Management, 7*(10), 489-505.

Saunders, M., Thornhill, A., & Lewis, P. (2014). *Research methods for business students.* (5th Ed.). Prentice Hall.

Schumpeter, J. A. (1911). The theory of economic development. Harvard University Press.

Sekaran, U., & Bougie, R. (2013). *Research methods for business.* (6th Ed.). John Wiley & Sons Ltd.

Suri, T., Jack, W., & Stoker, T. (2012). Documenting the birth of a financial economy. *PNAS, 109*(26), 10257–10262.

Thakur, R., & Srivastava, M. (2013). Customer usage intention of mobile commerce in India: an empirical study. *Journal of Indian Business Research, 5*(1), 52–72.

Wamalwa, P., Rugiri, I., & Lauler, J. (2019). Digital credit, financial literacy and household indebtedness. Retrieved from https://www.kba.co.ke

Wanjiru, M. N. (2016). Management practices of unsecured loans in commercial banks in Kenya: A case study of CFC Stanbic Bank Limited. Unpublished Masters in Business Administration Thesis, USIU-A, Nairobi.

World Bank (2018). Bankers without borders. Washington DC: World Bank.

Yamane, T. (1967). Statistics: An introductory analysis. (2nd Ed.), New York: Harper and Row.

Yum, H., Lee, B., & Chae, M. (2012). From the wisdom of crowds to my own judgment in microfinance through online peer-to-peer lending platforms. *Electronic Commerce Research and Applications*, *11*(5), 469–483.

APPENDICES

Appendix I Introduction Letter

Date ……

To

The Managing Director

…… Farmers' Cooperative Society

P.O Box……..

Dear Sir/Madam

REF: REQUEST FOR DATA ON EFFECT OF DIGITAL FINANCING ON FARMERS ACCESS TO CREDIT IN KIRINYAGA COUNTY

I am a postgraduate student at Strathmore Business School currently undertaking the underlined research. Your farmers' cooperative society have been selected and its members will be issued with questionnaires. Kindly help me to gather the required data that will be used purely for academic purposes.

Yours' Sincerely

Alex Kiragu.

Appendix II Questionnaire

My name is Alex Kiragu, currently pursuing post graduate program at Strathmore University Business School. This research seeks to examine the effect of digital finance on farmers access to credit in Kirinyaga County.

To maximize compliance with confidentiality your name should not appear anywhere in the document.

Section A: Demographic Characteristics

1. Kindly indicate the name of your cooperative society…….

Gender Male ( ) Female ( )

Age……

What is your marital status?

Single ( ) Married ( ) Widow/widower ( ) Separated/Divorced ( ).

How many years have you been in school……

What is your religious affiliation?

Catholic ( ) Protestant ( ) Muslim ( ) Hindu ( ) Traditionists ( )

Section B: Digital Financing

In this section, please tick against an answer that best describes your views concerning digital finance on access to credit among farmers in Kirinyaga County.

1- Strongly disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly agree.

	Fintech infrastructure	**1**	**2**	**3**	**4**	**5**
a	Acquisition of mobile phone that supports mobile lending apps aids in financial access					
b	Access of financial services through USSD aids in financial access					
c	We have options of accessing internet that aids in digital financing					
d	Our region has reliable internet that aids on digital financial access					

e	Reliability of internet aid in access of digital finance					
f	Non-intermittent digital finance platform aid in access of credit					
	Fintech ecosystem	**1**	**2**	**3**	**4**	**5**
a	Ease of use of mobile lending platforms aids in digital finance access					
b	Ease of transaction in digital platforms aids in digital financing					
c	Relational attributes in digital financing platforms aids in financial access					
d	Ideological features of digital lending platforms aid in provision of financial services					
e	Innovativeness of digital financial services providers aids in financial inclusion					
f	Proactiveness of digital financing aids in financial inclusion					
g	Risk taking of digital lenders aid in access of financial services					
	Regulatory Environment	**1**	**2**	**3**	**4**	**5**
a	The state of political stability in our region have created demand for financial services					
b	Legal requirement of digital lenders has effect on access to digital finance					
c	Some digital financing apps are unreliable due to changes in regulations					
d	Digital financing has led to changes in mobile financing services legislations					
e	Digital financing has positive contribution on financial liberalization					
f	Digital financing has led to clarity of financial rules and obligations					
g	Lack of agricultural subsidies have led to use of digital financing					
h	Sporadic agricultural sector regulations have led to use of digital financing					

Section C: Access to Credit

On a five point likert scale, indicate your level of agreement on how the following statements be describes your access to credit.

1- Strongly disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly agree.

	Access to credit	**1**	**2**	**3**	**4**	**5**
a	Through digital financing I can access finance promptly					
b	Through digital financing I have managed to develop my credit history					
c	Credit repayment patterns aids me in accessing more credit					
d	To aid on credit repayment I plan on how to invest borrowed funds					
e	I always ensure borrowed funds are allocated to intended needs					

Appendix III Ethical Research Approval

Strathmore UNIVERSITY

14th October 2021

Mr Kiragu Karimi Alex,
karimi.alex@strathmore.edu

Dear Mr Kiragu,

RE: Effect of Digital Financing on Access to Credit Among Farmers in Kirinyaga County

This is to inform you that SU-IERC has reviewed and **approved** your above **SU- master's** research proposal. Your application reference number is **SU-IERC1057/21.** The approval period is **14th October 2021 to 13th October 2022.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-IERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-IERC within 48 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-IERC within 48 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to SU-IERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and also obtain other clearances needed

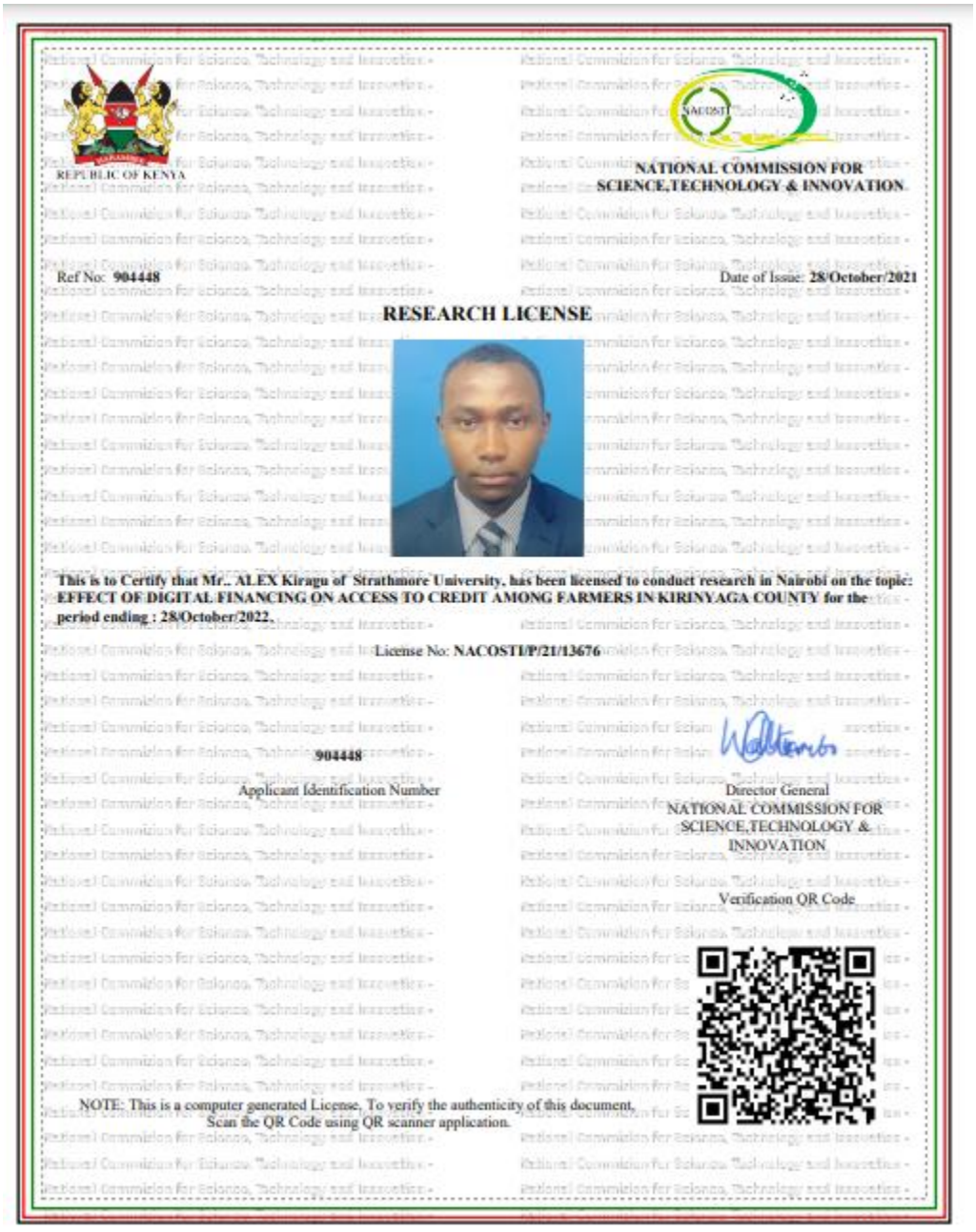
Yours sincerely,

Prof Fred Were,
Chairperson; SU-IERC

STRATHMORE UNIVERSITY INSTITUTIONAL ETHICS REVIEW COMMITTEE (SU-IERC)
14 Oct 2021
TEL: +254 (0)70303400
P.O BOX 59857-00200
NAIROBI-KENYA

Ole Sangale Rd, Madaraka Estate. PO Box 59857-00200, Nairobi, Kenya. Tel +254 (0)703 034000
Email admissions@strathmore.edu www.strathmore.edu

Appendix IV NACOSTI Research Permit



REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **904448**

Date of Issue: **28/October/2021**

RESEARCH LICENSE

This is to Certify that Mr.. ALEX Kiragu of Strathmore University, has been licensed to conduct research in Nairobi on the topic: EFFECT OF DIGITAL FINANCING ON ACCESS TO CREDIT AMONG FARMERS IN KIRINYAGA COUNTY for the period ending : 28/October/2022.

License No: **NACOSTI/P/21/13676**

904448

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix IV Cooperative's Letter request for engagement

Date ..19/01/2022.....

To:

The Manager

Kandiu Irrigation Farmers' Cooperative Society

P.O Box...210-...10301... KIANYAGA.

Dear Sir/Madam

REF: REQUEST FOR DATA ON EFFECT OF DIGITAL FINANCING ON FARMERS ACCESS TO CREDIT IN KIRINYAGA CENTRAL CONSTITUENCY

I am a postgraduate student at Strathmore Business School currently undertaking the underlined research. Your farmers' cooperative society have been selected and its members will be issued with questionnaires. Kindly help me to gather the required data that will be used purely for academic purposes.

Yours' Sincerely

KANDIU IRRIGATION F.C.S.
P.O Box 210
KIANYAGA

Alex Kiragu.

RWAMA F. C. S
RECEIVED
20 JAN 2022
P. O. Box 2466, EMBU

Date ...20/01/2022..

To:

The Manager

Rwama Farmers' Cooperative Society

P.O Box....20466 EMBU

Dear Sir/Madam

REF: REQUEST FOR DATA ON EFFECT OF DIGITAL FINANCING ON FARMERS ACCESS TO CREDIT IN KIRINYAGA CENTRAL CONSTITUENCY

I am a postgraduate student at Strathmore Business School currently undertaking the underlined research. Your farmers' cooperative society have been selected and its members will be issued with questionnaires. Kindly help me to gather the required data that will be used purely for academic purposes.

Yours' Sincerely

Alex Kiragu.

Date ...01/02/2022...

To:

The Manager

Mitooni II Farmers' Cooperative Society

P.O Box.....227-10304 KUTUS

Dear Sir/Madam

REF: REQUEST FOR DATA ON EFFECT OF DIGITAL FINANCING ON FARMERS ACCESS TO CREDIT IN KIRINYAGA CENTRAL CONSTITUENCY

I am a postgraduate student at Strathmore Business School currently undertaking the underlined research. Your farmers' cooperative society have been selected and its members will be issued with questionnaires. Kindly help me to gather the required data that will be used purely for academic purposes.

Yours' Sincerely

Alex Kiragu.

MITOONI PHASE TWO IRRIGATION CO-OP SOCIETY LTD. DATE 01/02/2022 RECEIVED P.O. Box 227 KUTUS

Date ...20/01/2022...

To:

The Manager

Kibirigwi Farmers' Cooperative Society

P.O Box.....31.....KARATINA

Dear Sir/Madam

REF: REQUEST FOR DATA ON EFFECT OF DIGITAL FINANCING ON FARMERS ACCESS TO CREDIT IN KIRINYAGA CENTRAL CONSTITUENCY

I am a postgraduate student at Strathmore Business School currently undertaking the underlined research. Your farmers' cooperative society have been selected and its members will be issued with questionnaires. Kindly help me to gather the required data that will be used purely for academic purposes.

Yours' Sincerely

Alex Kiragu.

KIBIRIGWI FARMERS CO-OPERATIVE SOCIETY LTD.
01 FEB 2022
P. O. Box 31, KARATINA
TEL: 061-72103 / 0725-059912

Date ..21/01/2022..

To:

The Manager

Karia Irrigation Farmers' Cooperative Society

P.O Box....1174....KERUGOYA.

Dear Sir/Madam

REF: REQUEST FOR DATA ON EFFECT OF DIGITAL FINANCING ON FARMERS ACCESS TO CREDIT IN KIRINYAGA CENTRAL CONSTITUENCY

I am a postgraduate student at Strathmore Business School currently undertaking the underlined research. Your farmers' cooperative society have been selected and its members will be issued with questionnaires. Kindly help me to gather the required data that will be used purely for academic purposes.

Yours' Sincerely

Alex Kiragu.

KARIA IRRIGATION
21 JAN 2022
P. O. Box 1173-10300,

Date ...15/01/2022...

To:

The Manager

Kithumbu Farmers' Cooperative Society

P.O Box....64.....KAGIO.

Dear Sir/Madam

REF: REQUEST FOR DATA ON EFFECT OF DIGITAL FINANCING ON FARMERS ACCESS TO CREDIT IN KIRINYAGA CENTRAL CONSTITUENCY

I am a postgraduate student at Strathmore Business School currently undertaking the underlined research. Your farmers' cooperative society have been selected and its members will be issued with questionnaires. Kindly help me to gather the required data that will be used purely for academic purposes.

Yours' Sincerely

Alex Kiragu.