

**DETERMINANTS OF ACCESS TO CREDIT BY
INDIVIDUALS IN KENYA**

By

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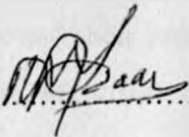
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**Research Paper submitted to the School of Economics, University of
Nairobi, in Partial Fulfillment of the Requirements for the Award of the
Degree of Master of Arts in Economics**

September, 2009

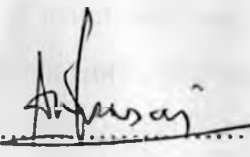
DECLARATION

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

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This research paper has been submitted for examination with our approval as university supervisors

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Dr. Joy Kiiru

ACKNOWLEDGEMENT

I am overly grateful to the Almighty, to whom all knowledge, wisdom and power belong for sustaining me in good health, sound judgement and strength to move on and complete my masters studies.

I am greatly indebted to my supervisors, Prof. W. Masai and Dr. J. Kiiru, who worked hand in hand with me to produce this research paper. Their tireless effort in guiding me write this paper and their positive criticism is highly appreciated. I however bear sole responsibility for any errors and/or omissions in this paper. This paper also benefited much from the constructive comments of Dr. Wambugu, Dr. M. Sichei and Dr. S. Ouma to whom I am extremely grateful.

Special thanks go to the University of Nairobi and the School of Economics particularly for sponsoring my postgraduate studies and by extension the African Economic Research Consortium. Also appreciated is the Central Bank of Kenya for availing the data used in this study.

I am greatly indebted to my dear parents Mr. and Mrs. Mwangi not forgetting my siblings for their prayers, moral and financial support and constant encouragement throughout my studies. I wish you God's blessings. My sincere appreciation also goes to my Uncle Mr. Simon Ndereba Muriuki and family for ensuring my comfort during the study period.

Last but not least my vote of thanks goes to all the masters class 2007/2008, my friends Edward, Mwai and Mathu for friendship, academic and moral support. Lastly, special thanks go to Ann Nyakio Nganga for her invaluable support and for standing with me all through my masters program.

DEDICATION

This research paper is dedicated to my loving parents, Mr. Michael Mwangi Kariuki and Mrs. Mary Wamuyu Mwangi to whom I owe so much for their undying love and sacrifice all my life.

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DEFINITION OF KEY TERMS AS USED IN THE STUDY

- Banked** : Individuals who claim to have access to credit from any financial institutions which operates more or less like a bank.
- Unbanked** : Individuals for whom no records exist as to where they seek credit facility.
- Formal credit** : Credit services obtained from Banks, SACCOS, MFI's, Government, Employer or Building Society.
- Informal credit**: Credit obtained from friends/relatives, ASCA's, ROSCA's, informal lenders or buyers of harvest.
- Financially Excluded**: Individuals for whom no records exist as to where they seek credit services.
- Cluster** : Location where an individual hails from, either rural or urban

ACRONYMS AND ABBREVIATIONS

KIHBS	Kenya Integrated Household Budget Survey
MFI	Micro Finance Institution
ASCA	Accumulating Savings and Credit Association
ROSCA	Rotating Savings and Credit Association
SACCO	Savings and Credit Cooperative Organization
GDP	Gross Domestic Product
CBK	Central Bank of Kenya
MDG	Millennium Development Goals
FSD	Financial Sector Deepening
MSE	Micro and Small Enterprise
MPC	Marginal Propensity to Consume
CBS	Central Bureau of Statistics
ERSWPC	Economic Recovery Strategy for Wealth and Employment Creation

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ABSTRACT

Access to credit remains a farfetched goal to the vast majority in Kenya. This is, despite the government efforts to deepen access through measures such as encouraging financial institutions to lower the lending rates. Over 75% of the total Kenyan population remain unbanked, with 49% of the banked accessing credit from friends and relatives. Viewed against the background of the growing evidence of the rising cost of living, the reduced access becomes a matter of concern. Enhanced access to credit is crucial due to the immense role that it plays in smoothing the consumption behaviour of individuals while at the same time boosting investment. This in turn leads to a reduction in poverty levels. In furthering this goal, the study tries to investigate the factors that either enhance or hinder access to credit by individuals.

The study utilized the financial access 2006/2007 national survey data. Bivariate probit and multinomial logit models were estimated to investigate the factors that determine choice of credit source by individuals in Kenya. Middle aged persons were observed to have more access to credit than the elderly. Their preference for formal credit was greater than that of informal credit. While financial institutions have for a very long time relied on credit rationing by using interest rates, there is need to change and instead make use of factors such as individual characteristics. Despite interest rates being high in formal institutions, access to credit from the formal financial institutions remained high. Distance to financial service provider was found to be a barrier to credit access from both the formal and informal sources.

On the other hand education level and age of individuals were found to contribute to increase in access to credit services. The study also established that women are more credit constrained than men. However since the study focused on access to credit from all sources, women were found to be more active in the credit market than men. There is need for the government to encourage increased productivity to raise the income of individuals as income leads to increased access to credit.

CHAPTER ONE: INTRODUCTION

1.1 Background

The financial sector in any country has a major role to play as a pillar to the operations of the other sectors of the economy. Easy access to credit¹ plays a critical role in the alleviation of poverty and suffering as per the MDG's. The government in conducting its mandate must ensure that the general welfare of the vast majority is enhanced. This can be partly achieved by empowering the general populace through access to affordable credit facilities.

Regarding the major impediments to the fast development of the financial system in Kenya, Fuchs and Beck (2004) postulate that wide interest rate spread between lending and deposit rates, limits access to financial services due to the high cost of services. This is discussed together with the limited number of strong and reputable financial institutions as well as the degree of uncertainty that lead to credit rationing.

The improvement of financial access, orderly development of SACCO's and MFI's, low cost of financial services and development of legal reforms form important pillars to the improvement of the performance of the financial sector. Financial systems play a critical role by acting as an intermediary between the surplus units and deficit units. Besides this, they help to achieve economies of scale in areas like information and gathering, risk pooling, portfolio diversification, accommodating varying liquidity preferences of savers and borrowers. This helps economic agents to decide on what financial services to pursue and from where.

Existence of varying externalities and information asymmetries however, limit the efficiency and effectiveness of financial system. This calls for prudent regulation of the financial sector through government involvement. However, care must be practised to avoid financial repression which may emanate from the application of double standards by the government (Wafula et al. 2004).

¹ Cash, goods or services given to an individual for which he/she pays for later.

The Economic Recovery Strategy for Wealth and Employment Creation (ERSWP) perceives access to credit as a significant factor in enhancing employment, economic growth and alleviation of poverty (GoK, 1968). Poverty remains largely a rural phenomenon facing most households (KNBS, 2006). The situation has been worsened by failure to access credit from the mainstream formal financial institutions like banks, insurance companies and microfinance.

In 2003, the Kenya government launched vision 2030 which aspires to create a vibrant and globally competitive financial sector aimed at creating more jobs and promoting reduced cost of borrowed capital i.e. interest rates. This will be achieved together with reducing the share of population without access to financial services from 85% to below 70% at present (GoK, 2008). A number of reforms also need to be put instituted to facilitate the transformation of the large number of small banks into few strong ones in Kenya.

Cost of borrowed funds is a key determinant to household access to credit. The decline in interest rates on loans from 30.4% in 1997 to 13.2% in 2005 coupled with an increase in lending by the financial sector enabled households to access credit easily (GoK, 2006). Financial liberalization stimulates economic development through the establishment of financial institutions. Successful liberalization however can only take place under an environment of a stable macroeconomic environment and sound banking system (Pradhan and Pill, 1997).

FSD Kenya (2008) postulates that close to 50% Kenyans living in rural areas are less likely to use banking services due to credit constraints. Only 26.4% (approximately 4.6 million of the estimated 17.4million adults in Kenya in 2006) of the total adult population in Kenya have access to formal financial services from banks, insurance companies, SACCO's and MFI's. 35.2% rely on ASCA's, ROSCA's among other informal financial groups. 38.4% are considered to be financially excluded as no records exist of where they

seek financial services. The report recommends more research into this issue with interventions being put in place to improve credit access.

1.2 Kenya's Financial Sector Development

The financial sector of any country consists of specialised and non specialised financial institutions, of organised and unorganised financial markets and of financial instruments and services that facilitate transfer of funds (Wafula, 2004). Kenya's financial system comes fourth in size after agriculture, manufacturing and public sector (GoK, 2005). The financial sector facilitates the establishment and development of the other sectors through a multiplier effect.

Competition in this sector accounts for the paradigm shift in major financial institutions which now concentrate on medium sized enterprises rather than the large corporate customers. Microfinance institutions have been very instrumental in Kenya for their role in serving new start ups and small enterprises which may not afford service from banks. This role has also been widely performed by ROSCA's, ASCA's and SACCO's (Chavas and Van de Brink, 1997).

The first financial institutions to be developed in Kenya were guided by the colonial rules through the colonial banking ordinance (1948). This was later followed by the establishment of Banks most of them being subsidiaries of the foreign banks. The operation of both the Banks and Non Bank Financial Institutions is governed by the Banking Act Cap 488 of the laws of Kenya (GoK, 1973).

The Central Bank of Kenya was established in 1966 under the Central Bank Amendment Act, Cap 481 to monitor the functioning of the monetary sector of the economy. The years that followed saw the establishment of cooperative societies, self help groups and microfinance institutions to offer credit services. However due to the varying needs, expectations and characteristics of the households, formal financial institutions have been very careful in the design of their products to reduce exposure to risk.

1.3 Commercial Banking Sector

Kenya's development of the Commercial Banking Sector stems from the trade connections that existed between Kenya and India at the end of the 20th century. This explains the reason why National Bank of India (NBI) was the first financial institution to set foot in Kenya. NBI commenced operation in Mombasa in 1896. Standard Bank of South Africa (SBSA) and National Bank of South Africa (NBSA) were to later join in 1910 and 1916 respectively.

Barclays Bank came as a result of amalgamation between National Bank of South Africa and Colonial Bank and Anglo Egyptian Limited in 1926. Central Bank of Kenya (CBK) which has the mandate to oversee the operations of these financial institutions came to be in 1967. By then, only eight foreign banks were in operation. They included: Bank of Baroda, Bank of India, Barclays Bank, General Bank of Netherlands, Habib Bank, National and Grindlays Bank, Ottoman and Standard Bank. Local Banks namely Cooperative and National Banks emerged in 1968. By 1986, 15 foreign and 9 local banks had been established (CBK, 1998).

Despite the fast growths in the financial sector, the institutions were still struggling with a myriad challenges which included oligopolistic tendencies, skewed geographical distribution, high non performing loans among others. These, coupled with imprudent lending practises and the inability to meet maturity obligations and statutory requirements led to imminent collapse of major banks between 1984 and 1986. An attempt by the government to prevent collapse of a number of NBFI's triggered the establishment of Consolidated Bank through amalgamation of one bank and nine NBFI's in 1989. The end of the 20th century saw most financial institutions either go into liquidation or put under statutory management.

Besides external factors, reasons such as poor lending practises, mismanagement, fraudulent activities, conflicting interest by shareholders who also served as managers, poor recovery of non performing loans, insider lending and undercapitalisation, engagement in risky ventures as well as acute market fluctuations were at play. The

market failure led to active government involvement to strengthen the institutions. The government raised the minimum capital requirements, carried out government divestiture from the banking system, encouraged merging of small banks to tap economies of scale, tightened bank regulations and improved the supervision of the banking system (CBK, 1998). By the year 2004, foreign banks accounted for over 50% of the total assets, loans and deposits, the rest going to local banks (Wafula, 2004).

1.4 Problem statement

Whereas access to credit propels economic activities, available evidence indicates that most people especially the poor are financially excluded due to credit rationing. This acts as a major obstacle to consumption smoothing and investment by individuals. According to FSD Kenya (2008) close to 70% of the total adult population in Kenya has no access to credit. Further, only 30.7% have a formal or informal access to credit services. The vision 2030 has launched a campaign to lower the percentage of adult population without access to credit to below 70%. The practise of credit rationing by financial institutions using interest rates has locked out most poor individuals as only large scale borrowers who expect higher returns can bear the high cost of borrowing (Stiglitz and Weiss, 1981). Due to the potential for adverse selection resulting from information asymmetry between lenders and borrowers, lenders are often discouraged from using the interest rate as a way to ration credit.

Access to basic needs for the vast majority of those individuals without access to credit remains a challenge. This is because they are not able to raise additional finances from the credit facility to supplement their meagre incomes and smooth their consumption behaviour. Most rural individuals particularly rely on informal credit facility from buyers and sellers of consumer goods like shops and farmers. However, where there is no full information about the level of risk and credit worthiness of the individual, access to credit facility from both formal and informal lenders is constrained.

An understanding of individual's demographic and socioeconomic characteristics serves to lower the information asymmetry that has characterised lenders and borrowers and

thus deepen access. This will lead to consumption smoothing and increased investment. Besides, such information can be used by the Central Bank of Kenya (CBK) to institute reforms aimed at improving and streamlining the operations of the financial sector. It will also enhance the removal of liquidity constraints thus encourage the exploitation of investment opportunities by individuals which ultimately lead to improved living conditions. With better knowledge regarding individual characteristics, financial institutions will also be in a better position to design products suited for the varying needs of the individuals rather than concentrate on credit rationing to minimize default rate.

1.5 Research Objectives

The general objective of this study is to establish the factors which determine individual access to credit in Kenya. The specific objectives of the study are:

- i) To establish the factors that enhances individual access to credit from formal, informal or non participation in credit market.
- ii) To investigate the factors limiting access to credit in Kenya.
- iii) To draw policy implications and make recommendations regarding access to credit in Kenya.

1.6 Justification of the study

This study will help in answering questions regarding the degree of substitutability between seeking credit facilities from either formal or informal sources. Besides, the study will inform on the market share held by each source of credit and action that can be taken by the credit service providers to maintain or raise the market share. The findings of the study can guide policy makers in designing credit programs which are tailored to customer needs. The CBK on its part is interested to know where attention should be directed in order to institute reforms aimed at improving the performance of the financial sector in terms of increased efficiency and overall stability. This will also be significant in shedding light on local and foreign investors interested in establishing financial institutions like Banks, MFI's among others. It will be interesting also to link people's pursuit of credit on the basis of gender, age, marital status and level of education. This

study will try to assess how the interaction of individual demographic characteristics like age and gender affect access to credit.

1.7 Organisation of the Study

The rest of this study is organised as follows; chapter two is the literature review and provides theoretical basis of access to credit, previous empirical studies and an overview of the literature. Chapter three presents the research methodology including econometric model specification, data sources and measurement of variables used in the study. Chapter four presents the findings of the study while chapter five summarises the study and draws recommendations for policy.

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical Literature Review

The most influential model of the demand for credit by household is the permanent income hypothesis (Friedman, 1957) which assumes the presence of perfect capital markets. This model further assumes that economic and political institutions do not matter, even though they determine the structure and costs of human interaction. On the contrary developing countries, especially low-income countries are characterized by institutional rigidities in the capital markets that deny the sustainability of the neo-classical assumptions of well functioning markets, perfect competition and mobility of factors of production. With institutions playing a critical role in determining the performance of economies, it is perhaps no surprise that credit channels plays a critical role as safety nets to cushion the poor against income loss or transitory changes in income as well as counter situations where the state is too weak to implement effective market policies.

Financial markets in developing countries are also characterized by ubiquitous information asymmetry and weak mechanisms to enforce formal contracts forcing them to look for alternatives in the informal sector which act as risk sharing mechanisms (Cox and Fafchamps, 2007). For example, Individuals are highly likely to receive financial support in form of loans from close relatives such as parents, spouses, and children. In addition, knowledge regarding the cost of capital for investment and its determinants influences investment decisions. Individuals are therefore interested in knowing the price to pay for the form of capital they settle on.

Walras theory of capital and interest divided between the stock of capital and the income flows arising from that stock. He argued that capital was not used up in the production process, but rather provided services and it was the services that entered the production process. The price of capital services is determined by their demand and supply. Capital stock comes under the rule of cost-of-production pricing which is subject to the law of cost of production (Walras, 1874). However, at the same time, Walras proposed that the price of capital stock is equated to the capitalized net income of capital services, which in

turn depends on the price of capital services. In his theory of money Walras (2006) appeared to support a strong public policy to regulate the money supply in order to ensure the preservation of economic equilibrium. His arguments were motivated by his concern for the wage earners who are usually the first to suffer in times of economic crisis.

The theory of capital market inflation postulates that the value of long-term security markets is determined by a disequilibrium inflow of funds into those markets. The resulting overcapitalization of companies leads to increased fragility of banking and undermines monetary policy and stable relationships between short- and long-term interest rates. This is in line with suggestions by Keynes in his theory of the speculative demand for money. Capital market inflation also creates an unstable financing structure in the capital market as a whole, (Jan Toporowski, 2000)

The theory of perfect capital markets developed by Modigliani and Miller (1958) postulates that it is possible for economic agents to spend beyond their income levels. Individuals can therefore borrow to meet their recurrent expenditure against their future incomes. The credit acquired from financial institutions helps in smoothing their consumption behaviour while at the same time promoting investment practises.

The pecking-order hypothesis (Myers, 1977) argues that economic agents finance their needs in a hierarchical fashion. They first use internally available funds before settling on debt and equity. This ranking is theoretically explained by the relative costs of the sources of financing, coming from information asymmetries.

Credit rationing arises due to the existence of a wedge between what a lender is willing and is able to lend. Stiglitz and Weiss (1981) argue that the wedge results from the exclusive choice of the lender to supply less than what the market demands. Information asymmetry explains the reason why financial institutions practise credit rationing.

Due to adverse selection in credit markets, lenders cannot be able to distinguish between borrowers of various degrees of risks and hence rather than risk their investments they either raise the interest rates or ask for high collateral to cushion themselves against risk

of default. This however only attracts large scale borrowers who expect higher returns (Stiglitz and Weiss, 1981). Due to the lenders preferences running counter to borrower wishes, the lenders result to setting interest rates below market clearing rates but ration their credit to minimize risk of loss. Similar studies on information asymmetry have been carried out by Russell and Jaffee (1976) and Akerlof (1970). Use of non price factors is recommended in credit rationing.

Diamond (1984) argues that the relationship between financial institutions and firms also determines access. Those organizations with close relationships are seen to have more access to credit. Relationship with a single bank may reduce risk and hence the cost of credit, i.e. interest rates may be reduced. This is due to reduced incidence of moral hazard and improved knowledge of the firm which ultimately reduces adverse selection.

The establishment of the informal financial institutions is a direct result of the many deficiencies associated with seeking financial assistance in the formal financial institutions. As such people revert to the micro finance institutions where they can acquire funds with ease and fewer restrictions. Most formal financial institutions like banks perceive loans extended to the poor households to be very risky and therefore impose many restrictions on them by demanding collateral which they cannot afford. Due to their poor status in life, their marginal and average propensity to consume is so high (Keynes, 1936), implying that, given financial assistance, they will first try to meet their basic needs before thinking of how and where to invest their money. Such challenges being faced by the poor have attracted the international community to try to improve the welfare of the people in line with Millennium Development Goal (1) so as to alleviate poverty and suffering. The government of Kenya has also through the development banks tried to bridge the gap by extending funds to the poor through various channels. However, the goals are yet to be attained.

Failure by formal financial institutions to offer credit services has forced most individuals to look for alternative means of raising funds from informal sources. Information asymmetry reduces information on how and where it is most convenient to access funds.

Agriculture being the main stay of the Kenyan economy has been worst hit since failure to access funds by the farmers has greatly reduced the productivity with most people resorting to small scale businesses whose returns are comparably higher than those obtained from agricultural activities.

With the collapse of the Agricultural Development Corporation (ADC) in the late eighties, reduced commitment by the government to give incentives to willing farmers in terms of provision of farm inputs and marketing of their produce, the farming industry also went to a standstill before microfinance institutions took up that role in enhancing increased productivity. Today, most of those preconditions have been relaxed, with many people now being able to access funds even without collateral. Most important is that, even with produce from the farm like milk, one is extended some financial assistance.

The stiff competition that has characterised the Kenyan financial institutions has forced banks to adopt a door to door campaign to market their products to maintain their market share and remain relevant. The fact that, the whole world is redirecting its efforts towards the less privileged in society has acted as a wake to the mainstream financial institutions to be on the lookout or else risk being forced out of the market. The international agencies have also come out publicly that, they are only ready to work with those institutions that are involved in providing funds to small groups.

2.2 Empirical Literature

Empirical studies aiming to identify credit constrained individuals are based on two major approaches. Most of the studies follow an indirect approach based on the sensitivity of current consumption to transitory income as indicated in the permanent income hypothesis (Hall, 1978; Hall and Mishkin, 1982; Hayashi, 1985; Browning and Lusardi, 1996 and Besley, 1995). It is assumed that, with standard convex preferences, and in the absence of liquidity and borrowing constraints, transitory income shocks should not affect consumption (Diagne et al., 2000; Zeldes, 1989). Violation of this hypothesis informs of the existence of credit constraints in the market. These indirect tests could result in imprecise estimates of the effects of credit constraints. Besides,

uncertainty leads to precautionary behaviour and a dependence of consumption on transitory income even in the absence of credit constraints.

The second but a more direct approach, exploits information about the status of loan applications of households (Feder et al., 1989; and Jappelli, 1990). The method involves collecting data to establish those with access and those who are excluded. This approach is grounded on the level of access to credit markets to identify credit constraints. Feder et al's survey of China targeting 187 agricultural households sought to establish whether households would have liked to borrow more institutional credit at the going interest rate than they were granted. Non-borrowing households were asked about their reason for not borrowing. Those who were unable to access credit were classified as credit constrained. This method has also been used by; Barham et al (1996), Zeller (1994) and Barham and Boucher (1994). In this study on Kenya, the analysis goes a step further by investigating the probability choosing either a formal credit source or an informal credit source by individuals who participate in the credit market.

Japelli (1990) used the direct method to analyze the data from the 1983 US survey on consumer finances targeting 2971 households to determine who is constrained. He established that close to 19% of the total households appeared to be credit constrained. His definition of credit constrained individuals was similar to that of Zeller (1994). It incorporated those who reported rejected application of credit or those who reported being granted less than what they initially applied for. Those who didn't apply for fear of being denied were also included.

In a survey of 6 provinces in Indonesia, Johnson and Morduch (2007) targeting 1428 households who applied for a Bank Rakyat Indonesia (BRI) microloan, the results revealed that of the 40% poor households judged creditworthy, only 14% had recently borrowed over the past 3.5 years despite their proximity to the service provider. The main reason for not borrowing was lack of adequate income. While loans for small businesses were desired, respondents' highlighted broader household needs, including paying for

school fees, medical treatment, and home repair as reasons to borrow. Despite the dire need for cash, most households appeared uncomfortable taking credit.

Zeller (1994) used the direct method in a study targeting formal lenders and credit groups in Madagascar and established that demographic characteristics of households namely age and education had a positive relationship to informal credit access.

Marge Sults (2003) analyzed a survey of 3000 Union Bank of Estonia (UBE) customers to investigate Estonian households and their borrowing behaviour. The study found that 33% admitted being credit constrained. The proportion of those constrained stood at 36.1% for women as opposed to 28.8% for men. In terms of age, the most constrained age group was 26-35 years standing at 40.6%. The least was 18-25 years at 28.8%. Post graduate holders were least constrained at 28.6% while the most constrained were secondary holders at 35.5%. In terms of income, those with high income were least constrained. Regarding household size, those with large families appeared to have less credit constraints than those with small ones. Those with two children were more constrained at 35.8% while those with five children stood at 31.9%.

Navajas and Tejerina (2006) reviewed various surveys of household businesses in Ecuador, Guatemala, Nicaragua, Panama, and the Dominican Republic. They established that roughly 20% of the households had applied for a loan. Among those who didn't apply for a loan, 42% argued that they did not need a loan while close to 60% cited high service cost as the reason for not applying.

Barham, Boucher and Carter (1996) surveyed 201 producer households in Guatemala and established that 34% of the households were constrained by private banks. Of the 34%, 28% were also fully constrained by the credit unions and 27% were partially constrained by the credit unions.

Contrary to the theory of the optimization of consumption which argues that household consumption is constrained by its lifetime budget constraint, empirical studies have

shown that consumption is more sensitive to temporary increase in income rather than a permanent increase in income, perhaps because households suffer from credit constraints. Campbell and Mankiw (1989) investigated the link between consumption, income and interest rates and found that transitory changes in income influence consumption even in the absence of credit constraints.

The difficulties faced by households in obtaining credit, their characteristics as well as the determinants of the likelihood of being rationed out of the credit market and the volume of loan accessed by households have also been studied. For example Diagne (1999) establishes that, the composition of household assets appears to be much more important as a determinant of household access to formal credit than the total value of household assets or landholding size. The ownership of large tracts of land and large share of livestock in the total value of household assets is no guarantee to the access of funds from formal financial institutions. However, landholding size remains a significant determinant of access to informal credit. He further argues that, despite the poor household's possessing both livestock and land, their desire to involve themselves in other non-farm activities may be greatly constrained by lack of capital. Failure to engage in non-farm activities limit their wealth accumulation since most of the surplus produce actually goes to waste due to lack of markets and the fast perishability of the produce. These findings are in line with those of Bhuiya et al (2001) in a study carried out in Bangladesh targeting rural women and their experience with micro-credit providers, which established that micro credit mostly benefits the financially well up persons.

Another study (Diagne, Zeller and Sharma, 2000) surveyed 404 households in Malawi established that 61% of those in credit programs experienced either formal or informal credit constraints. 92% of those who have never participated in any credit program gave credit constraints as the major reason.

In terms of gender, Mayada et al (1994) found from a survey of Ecuadorian microenterprises that women were discriminated against in access to credit from formal financial institutions. Despite few women having applied for credit, less credit was

extended to women than men. But Zeller (1994) in a study using data from Madagascar found that gender had no impact on access to credit.

Wright and Mohieldin (1996) in their study on formal and informal credit markets in Egypt tried to quantify the size, role and interaction of both formal and informal financial markets. Whereas formal loans financed investment projects, informal loans were mainly for consumption smoothing and were mainly directed to those people with lower standards of living. Despite the informal markets giving smaller loans, it was observed to be more vibrant and active than formal markets.

Rasmussen et al. (2005) surveyed the microfinance sector in Bangladesh and established that 10 percent of households are too poor to be able to use the micro credit offered. Households were credit rationed due to poverty implying that, those with more income are likely to have more access to credit. The authors argue that for these people, other services like grants, special services, and savings vehicles may be more useful.

Imperfect information, moral hazard and adverse selection greatly influence the supply of and demand for credit. Formal financial institutions are especially faced with this problem. The informal financial institutions are designed in such a way that those problems are addressed (Chavas et al. 1997). An assessment of informal institutions revealed that moral hazard in informal financial institutions is lower than in the formal institutions due to reduced information asymmetry.

Freixas and Rochet (1997) also focus on information asymmetry distinguishing between moral hazard, adverse selection and the costly state verification model which is a stage after the moral hazard. These asymmetries are found to be the sources of credit rationing since they push the market away from perfect equilibrium. Capital market imperfections can suppress the aggregate accumulation of capital, the rate of return on investments, technology adoption, and productivity (Hubbard and Kashyap, 1992). Besides, inefficient legal systems diminish collateral leading to a credit constrained equilibrium hindering

economic agents from taking advantage of all their investment opportunities despite the guarantees they can provide.

Bali Swain (2002) analyzed household survey data collected in India and targeting 761 farm households. The study established that 72% of the households reported that they were credit constrained. Rationing of households by the formal markets is based on the assumption that all households have a positive demand for formal credit and consider it to be a cheaper source of borrowing. The probability of accessing credit by households with large tracts of land was found to be higher than that of households with smaller pieces of land. In terms of credit rationing, the study found that only 29% had access to formal credit.

When deciding between formal and informal loans, borrowers appear to concern themselves more about the non cost attributes of the informal loans they have access to than about the relative cost of the two types of loans (Udry, 1994). For individuals who are already in a credit program, formal and informal credit does appear to be substitutable.

Kochar (1997) established that 26% of the 2415 households who participated in a debt and investment survey in India reported being credit constrained. The choice made by households in their search for financial agent is determined by both the observed and latent variables. They may include the limitations associated with choosing one agent and not the other as well as the utility to be derived from the choice made. Diagne Aliou (1999) argue that the unobserved attributes are more important than even the rates of interest charged.

Magill and Meyer (2005) in a survey of 17,000 micro enterprises in Ecuador established that only one out of six respondents interviewed had requested for loan in the past 12 months. Of those who had not requested for loan, about half did not want credit at all. 37% did not want to be indebted while 14% felt that they did not need a loan.

2.3. Overview of the Literature

The literature reviewed supports the permanent income hypothesis as the most influential consumption theory. However it has been noted that contrary to expectations of permanent income hypothesis where only permanent changes in income affect consumption, transitory changes in income have a role to play (Campbel and Mankiw, 1989). Regarding the approach to be used, the direct method by Japelli (1990) appears to be more robust. This method was used to counter the shortcomings of the indirect method where factors such as uncertainty was observed as leading to precautionary behaviour among households which ultimately led to changes in the consumption behaviour due to transitory changes in income even in the absence of credit constraints.

Regarding the determinants of access to credit, empirical literature indicates that increase in income raises access to credit. This was supported by Johnson and Morduch (2007), Diagne (1999), Bhuiya et al (2001) and Marge Sults (2003). People with more wealth captured in terms of household assets, size of land and number of livestock are found to have greater access to credit. Rassmussen et al (2005) puts it rightly by his argument that poverty is indeed a credit constraining factor. Bali Swain (2002) shares similar sentiments through his findings that more resource endowment enhances access to credit.

Age and education appeared to play greater role in the informal credit markets. Zeller (1994) established that highly educated persons preferred loans from informal markets than formal ones. In general, more educated persons were less constrained according to Marge Sults (2003). In terms of age, the study argued that persons falling between 26-35 years were more constrained than those less than 26 years of age. The study further argued that big families were less constrained.

Other determinants cited included gender where Mayada et al (1994) claimed that women are especially discriminated against in formal financial markets. However, according to Zeller (1994), gender appeared to have no impact. Navajas and Tejerina (2006) cited high service cost as a major constraint.

CHAPTER THREE: METHODOLOGY

3.1 Conceptual Framework

The current study adopts a direct approach as used by (Jappelli, 1990 and Marge Sults, 2003) where data on the credit status of households has been collected. This approach focuses on those who applied and received credit, those who applied and were denied and those who never applied for credit. While both studies explored those with access and the credit constrained, the current study seeks to extend this study by distinguishing the level of access with respect to formal and informal institutions. This is besides capturing the impact of the interaction between age and gender.

An individual will choose that credit program which yields maximum benefits and one that cost less. In pursuit of this objective, the individual will therefore draw a comparative analysis on the various choices available in the market. However, a number of constraints limit his utility maximization objective.

First, access to credit from both the formal and informal channels requires a certain amount of collateral. At times the security demanded is unaffordable. Secondly, institutions may require the individual/group goodwill of guarantors. This requirement acts as a major hindrance. Banks especially do not approve of just any signatory presented, they have to scrutinize them. Most of the people for fear of the borrower running bankrupt will therefore not agree to be signatories. This makes it even harder for the poor individuals to access funds from the formal financial institutions. At least the informal institutions will agree to signatories from friends and close relatives.

Third, with information asymmetry, it becomes increasingly hard for the individual to know the most optimal choice to make. This results in credit rationing by financial institutions. Most financial institutions will not disclose all the information about their products. It is only after receiving the services when one learns about the hidden costs. This acts as a disincentive to individuals influencing them from seeking funds in such institutions.

3.2 Theoretical Model

This study is motivated by McFadden's random utility model (RUM). An individual is faced with various alternatives. The utility function can be written as:

$$U_{ij} = U_j(x_{ij}, z_{ij})$$

Where;

U_{ij} represents the utility derived by individual i , from choice of alternative j

x_{ij} represents the observed characteristics of individual i and alternative j chosen

z_{ij} represents the unobserved characteristics of individual i and alternative j chosen

This approach incorporates both the observable and unobservable characteristics of individuals and the alternatives they choose.

The Additive Random Utility Model is specified as follows;

$$U_{ij}(x_{ij}; z_{ij}) = V_j(x_{ij}; \beta) + \varepsilon_{ij}$$

$$\varepsilon_{ij} = U_{ij}(x_{ij}; z_{ij}) - V_j(x_{ij}; \beta)$$

Where;

$V_j(x_{ij}; \beta)$ is the observable or deterministic portion of the utility estimated while

ε_{ij} is the unknown utility.

β represents the estimated coefficients of the explanatory variables

Assuming that the individual faces two choices, A and B and that the choices are made randomly, A is chosen if;

$$V_A(x_{iA}; \beta) + \varepsilon_{iA} > V_B(x_{iB}; \beta) + \varepsilon_{iB}$$

$$V_A(x_{iA}; \beta) - V_B(x_{iB}; \beta) - (\varepsilon_{iB} - \varepsilon_{iA})$$

let

$$g(x_i, \beta) = V_A(x_{iA}; \beta) - V_B(x_{iB}; \beta)$$

$$\eta = (\varepsilon_{iB} - \varepsilon_{iA}) = [U_{iB}(x_{iB}, z_{iB}) - V_B(x_{iA}; \beta)] - [U_{iA}(x_{iA}, z_{iA}) - V_A(x_{iA}; \beta)]$$

$$C_i^* = g(x_i, \beta) - \eta_i$$

Where: C_i^* is the latent variable which drive one in choosing a certain alternative

x_{ij} and z_{ij} are as defined above.

β represents the estimated coefficients of the explanatory variables

$V_A(x_{iA}; \beta) + \varepsilon_{iA}$ is the utility derived from choice of alternative A where $V_A(x_{iA}; \beta)$ is the observable or deterministic portion of the utility estimated while ε_{iA} is the unknown utility.

$V_B(x_{iB}; \beta) + \varepsilon_{iB}$ is the utility derived from choice of alternative B where $V_B(x_{iB}; \beta)$ is the observable or deterministic portion of the utility estimated while ε_{iB} is the unknown utility.

$g(x_i, \beta)$ is the observable difference in utilities from choice of alternative A and not B.

η (Eta) is the unobservable difference arising from the omission of other variables.

The latent variable incorporates both the observable $g(x_i, \beta)$ and the unobservable (η_i) differences in utility.

This implies that the choice made by an individual is guided by the difference in utility from the various alternatives available. Individual i is assumed to choose alternative A if $U_A > U_B$. The errors ε_{iA} and ε_{iB} arise from omitted variables, measurement errors and specification errors arising from the functional choice.

3.3 Model specification

This study makes use of a bivariate probit model to determine the probability of accessing credit from formal financial markets and the factors that drive the access. In addition, a multinomial logit model is used to establish the factors that determine access to credit from either a formal or an informal financial market. The utility maximisation objective from the consumption of consumer goods is enhanced through availability of credit which increases the availability of funds to individuals. An individual chooses alternative A if the total benefits surpasses those of all other alternatives, 'j' in the individual choice set.

This can otherwise be stated as:

$$U(Z_A, \alpha_i) \geq U(Z_B, \alpha_i) \forall j \Rightarrow A \succ B \in C$$

Where:

U is the utility function of the choice made.

Z_A, Z_B represent vectors of attributes describing alternatives A and B respectively

α_i is a vector of individual characteristics which drive his choice

$A \succ B$ which implies that alternative A which is to the left is preferred to alternative B

$\forall j$ refers to all alternatives, j , in the choice set

The demographic variables will include age, gender, marital status and level of education while the socioeconomic variables will assume factors like individual earnings. Proximity to financial institutions as well as processing and interest rate charges will also be analysed.

$$C = f(r, Y, A, G, A_G, M, E, D, HH, L, A^2)$$

Where; $C = \text{Access to credit}$

$r = \text{Interest charges which also serves as a risk factor}$

$Y = \text{Individual earnings}$

$A = \text{Age of the individual}$

$G = \text{Gender}$

$A_G = \text{Interaction of Age and Gender}$

$M = \text{Marital status}$

$E = \text{Level of Education}$

$D = \text{Distance from the Financial Service Institutions}$

$HH = \text{Household size}$

$L = \text{Location whether urban or rural}$

$A^2 = \text{Age squared}$

3.3.1 Bivariate Probit estimation

The main issue in this case is to establish the factors that drive access to credit from the formal financial markets. Use of bivariate probit model is motivated by the correlation between the error terms ε_1 and ε_2 since the choice of formal credit is conditional on one being banked.

The bivariate probit is specified as follows Green (2003):

$$c_1^* = x_1\beta_1 + \varepsilon_1, \quad c_1 = 1 \quad \text{if} \quad c_1^* > 0, \quad 0 \quad \text{otherwise}$$

$$c_2^* = x_2\beta_2 + \varepsilon_2, \quad c_2 = 1 \quad \text{if} \quad c_2^* > 0, \quad 0 \quad \text{otherwise}$$

$$E[\varepsilon_1 | x_1, x_2] = E[\varepsilon_2 | x_1, x_2] = 0.$$

$$Var[\varepsilon_1 | x_1, x_2] = Var[\varepsilon_2 | x_1, x_2] = 1$$

$$Cov[\varepsilon_1, \varepsilon_2 | x_1, x_2] = \rho$$

This specification says that C_2 is observed when $C_1^* > 0$ but C_2^* need not take on any meaningful value when $C_1^* \leq 0$

The bivariate normal Cumulative Distribution Function (CDF) is specified as follows.

$$prob(X_1 < x_1, X_2 < x_2) = \int_{-\infty}^{x_1} \int_{-\infty}^{x_2} \phi_2(z_1, z_2, \rho) dz_1 dz_2, \text{ otherwise stated as}$$

$$\Phi_2(x_1, x_2, \rho)$$

Differentiation of the above function yields the Probability Density Function (PDF) which gives the marginal effects.

The density function is specified as follows:

$$\phi(x_1, x_2, \rho) = \frac{e^{-(1/2)(x_1^2 + x_2^2 - 2\rho x_1 x_2)(1-\rho^2)}}{2\pi(1-\rho^2)^{1/2}}$$

The subscript 2 in the CDF Φ_2 and PDF ϕ_2 stands for a bivariate normal distribution.

3.3.2: Multinomial logit model

The credit seeking behaviour of an individual can also be captured as a multiple choice problem and estimated using multinomial logit. The errors in this model are assumed to be identically and independently distributed (iid) across both alternatives and individuals. The assumption that error terms are extreme value or Gumbel distributed closely

approximates the normal distribution hence producing closed form solutions (Greene, 2003)

$$C^* = \beta_0 + \beta_1 r_i + \beta_2 Y_i + \beta_3 A_i + \beta_4 G_i + \beta_5 A - G + \beta_6 M_i + \beta_7 E_i + \beta_8 D_i + \beta_9 III_i + \varepsilon_i$$

Where C^* is the latent variable on the observed choice.

$$C_i^* = 0, 1, 2, 3, \dots, J$$

The three main alternatives considered are formal, informal and the financially excluded. Formal institutions in this case refer to Banks, SACCO's, MFI's, Government, Employer and Building Society. Informal institutions refer to ASCA's, ROSCA's, Family/friends, Informal lenders and Buyers of harvest while those who don't choose any of these alternatives are considered to be the financially excluded. Besides the socioeconomic characteristics of individuals, preference for the above choices has been explained by factors such as geographical separation and interest charged by formal financial institutions.

Assume there are J alternatives and the dependent variable y is defined to take value j if the j th alternative is taken, $j = 1, 2, \dots, J$

The probability that alternative is chosen is j

$$p_j = \Pr [y=j] \quad j = 1, 2, \dots, J$$

For maximum likelihood estimation, multinomial density function given the three sources of credit is defined as follows:

$$f(y) = p_1^{y_1} \times p_2^{y_2} \times p_3^{y_3} = \prod_{j=1}^3 p_j^{y_j}$$

The likelihood function will be specified as follows

$$L = \prod_{i=1}^{4420} \prod_{j=1}^3 p_{ij}^{y_{ij}}$$

$$\text{where; } p_{ij} = \frac{e^{\beta_j x_i}}{\sum_j e^{\beta_j x_i}}$$

Where;

p_{ij} is the probability that the i^{th} individual chooses alternative j .

y_{ij} is the choice of alternative j by the i^{th} individual.

Maximum likelihood estimates are obtained through maximizing the log likelihood function. Predicted probabilities can then be computed.

The probability of choosing either formal credit or informal credit is specified as follows:

$$\Pr [y=1] = \frac{e^{x\beta^1}}{1 + e^{x\beta^1} + e^{x\beta^2}}$$

$$\Pr [y=2] = \frac{e^{x\beta^2}}{1 + e^{x\beta^1} + e^{x\beta^2}}$$

3.4 Description of variables and expected signs

The table below presents the various variables targeted in this study to explain individuals' preferences for their choice of a suitable source of credit. The base category among the various credit sources is the financially excluded.

Variable	Description	Expected sign	Explanation
Interest rate	1 for those who consider interest rates in formal markets to be high, 0 otherwise.	Negative	The higher the cost, the lower the access (GoK, 2006, Fuchs and Beck, 2004))
Stable incomes	Proxied using dummies capturing the individual's main activity that earns him/her money. 1-Reliance on Remittances and transfers; 2-Self employed in agricultural sector; 3-Self employed in business or Non-agricultural sector. 4-Waged or employed in any sector;	Positive	Transitory changes in income affect consumption (Campbel and Mankiw, 1989)
Age	Age of respondents in years	Positive	Access at intermediate age is higher (Zeller, 1994)
Level of	This is captured using years of	Positive	The higher the education , the

Education	schooling		higher the demand (Zeller, 1994)
Gender	1-Male (Reference dummy); 2-female	Negative for women	Women are discriminated against (Mayada et al, 1994)
Age Gender	Random selection of age category and gender	Positive	Likely to be positive for intermediate aged males (Zeller, 1994; Mayada, 1994)
Marital Status	1-Single (reference dummy); 2-Divorced; 3-Widowed; 4-Married/living with Partner; 5-Dont know	Positive	Based on the household constitution
Household Size	Number of family members in household	Positive	Large families are less constrained (Marge Sults, 2003)
Distance from Credit Source	1-Credit service provider is very far (Reference dummy); 2-far; 3-not so far; 4-near	Negative	Despite being close to credit source, households were still rationed (Johnson and Morduch, 2007)

3.5 Data

The analysis is based on Financial Access, 2006 survey data, collected by the Financial Sector Deepening (FSD) Kenya, in collaboration with the Central Bank of Kenya and the Kenya National Bureau of Statistics (KNBS). FSD is an organization founded in 2005 with an aim of accelerating growth of the financial markets to stimulate wealth creation and poverty reduction by low income households and small enterprises. The data contains information on 4420 households in Kenya. The households were selected randomly throughout the country based on the rural and urban clusters. Individuals were later selected from those households to give their response on their banking status. A structured questionnaire was used to collect the data.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1: Introduction

This chapter presents a comprehensive presentation of the findings of the study. The chapter provides a tabular presentation of the descriptive statistics before presenting the findings on the banking status of individuals in Kenya and the factors that drive the choices made. Both probit and multinomial logit results have been reported.

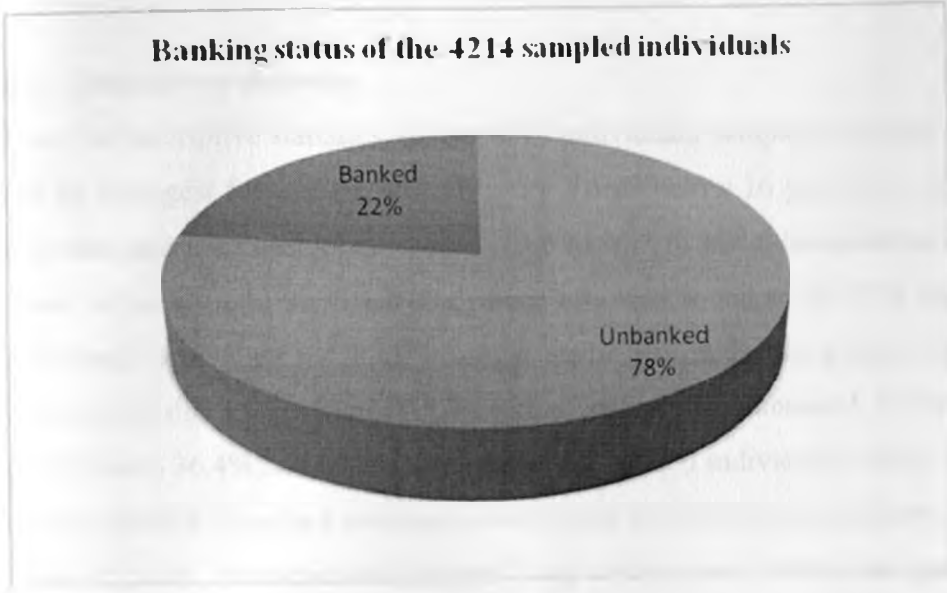
4.2: Descriptive Analysis

A total of 4214 individuals expressed their preference for a certain source of credit. This section therefore systematically presents both the descriptive and econometric analysis of access to credit. Table 4.1 below shows the distribution of access to credit by the 4214 individuals sampled. Loans from friends and relatives (12.79%) appeared to be quite popular as compared to the other sources of credit. Banks accounted for only 1.335 of the total market share.

Table 1: Distribution of choice of credit source made by individuals in Kenya

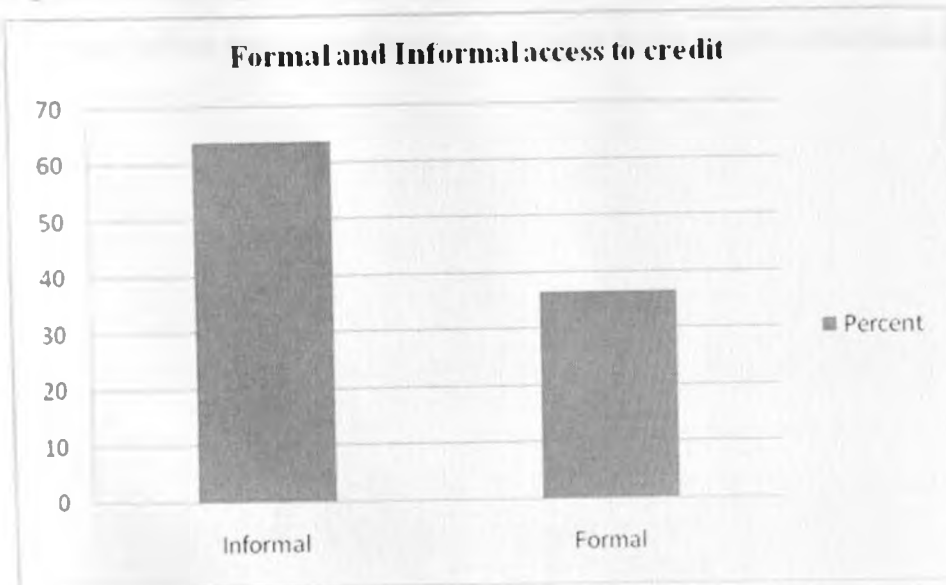
distribution	Frequency	Percentage share
Unbanked	3,271	77.62
Commercial Banks	56	1.33
SACCO	115	2.73
MFI	33	0.78
Govt. Inst.	27	0.64
Employer	27	0.64
ASCA	59	1.40
Family/friend	539	12.79
Informal lender	34	0.81
Buyer	42	1.00
Building society	11	0.26
Total	4,214	100.00

Figure 1: Banking status



In general, close to 78% of the entire Kenyan population remain excluded from the credit markets as indicated in the figure below. Only 22.43% have access to credit in Kenya. This represents 3269 and 945 individuals who are unbanked (financially excluded) and banked respectively.

Figure 2: Banking status between formal and informal access to credit



Of the 945 banked individuals, 36.40% preferred a formal access to credit while 63.60% preferred informal credit. This is represented in figure 2 above.

4.2.1: Descriptive statistics

From the descriptive statistics, of the 4214 individuals sampled, the oldest was 90 years and the youngest focused on was 18 years. Those below 16 years were not investigated since they are not considered to be mature enough to make independent decisions as to where to seek credit services. The mean age was found to be 37.4 years. Only 945 individuals equivalent to 22.43% sought credit from a certain known source of credit. This implies that a whopping 77.57% of Kenyans remain unbanked. 344 and 601 persons equivalent to 36.4% and 63.6% represented the banked individuals whose choice of credit source could be classified as being either formal or informal respectively. For the formal choice of credit, more married/persons living with spouse (79.9%) had greater preference when compared to the singles, widowed and divorced persons.

In terms of education, 45% of those interviewed appear to have attained primary education. Secondary education and above accounted for 36% while 18% represent persons without basic education. 19.15% of the 945 banked individuals had completed secondary education level. This compared to the 11.85% of those without any form of education but with access to credit implies that higher education deepen access to credit. The figure below represents the education status of the sampled individuals.

Figure 3: Education Status

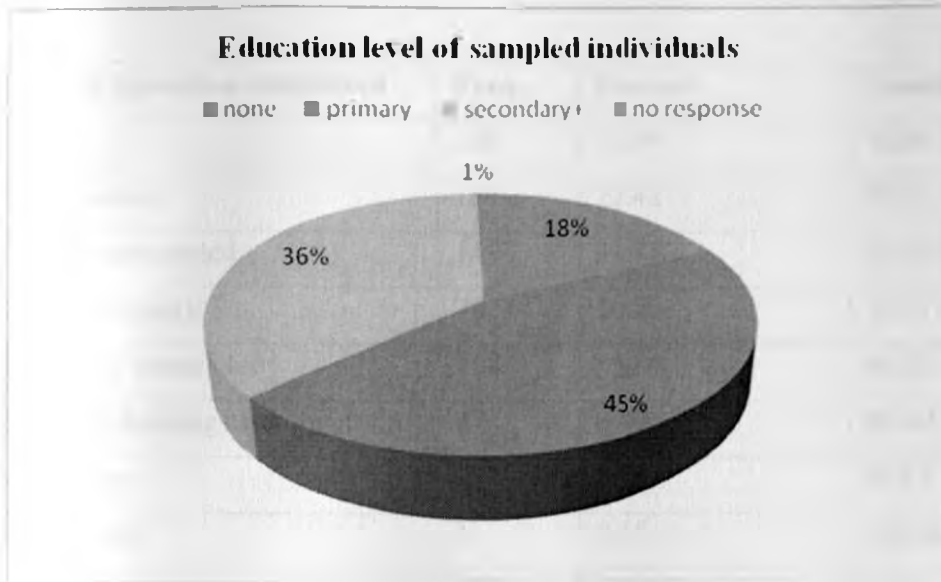


Table 2: Education status of formally banked individuals

Highest education level completed	Freq.	Percent	Cum.
None	8	2.33	2.33
some primary	33	9.59	11.92
primary completed	40	11.63	23.55
some secondary	26	7.56	31.10
secondary completed	91	26.45	57.56
technical training after	87	25.29	82.85
University	58	16.86	99.71
no response	1	0.29	100.00
Total	344	100	

Only 31.10% of the formally banked individuals had attained at most some secondary level schooling. This, compared against 75.37% in the case of informally banked individuals clearly indicates that higher education is an important determinant to credit access in formal markets than informal markets.

Table 3: Education status of informally banked individuals

Highest education completed	Freq.	Percent	Cumulative
None	108	15.84	15.84
some primary	187	27.42	43.26
primary completed	149	21.85	65.10
some secondary	70	10.26	75.37
secondary completed	108	15.84	91.20
technical training after	47	6.89	98.09
University	12	1.76	99.85
no response	1	0.15	100.00
Total	682	100.00	

More women than men appear to be banked in Kenya. Out of the 945 banked individuals, 486 representing 51.43% were women. This is slightly more than the banked male individuals. This may be explained by the degree of independence and level of aggressiveness with which ladies are handling issues in the contemporary society. The fact that more females representing 56.17% were interviewed could be a contributing factor. Cumulatively, more women than men i.e. 38.15% and 31.73% were single, divorced or widowed implying that those women were more independent in their judgement and this is reflected in their banking status. Due to their number in the sample size, they also form a majority in the unbanked population implying that in as much as most of them are banked quite a big number of women remain financially excluded. This is illustrated in the figure below.

Figure 4: Gender based participation in credit markets

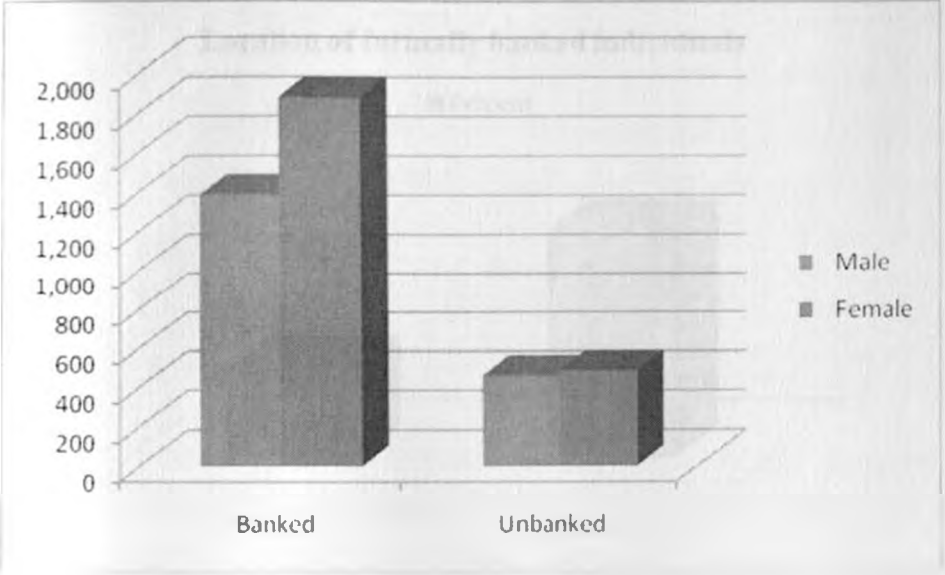
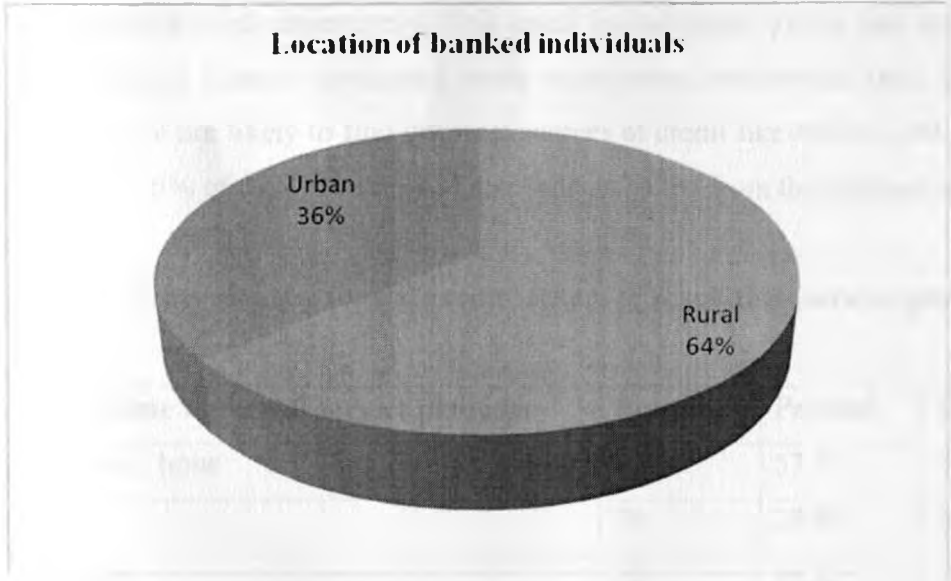
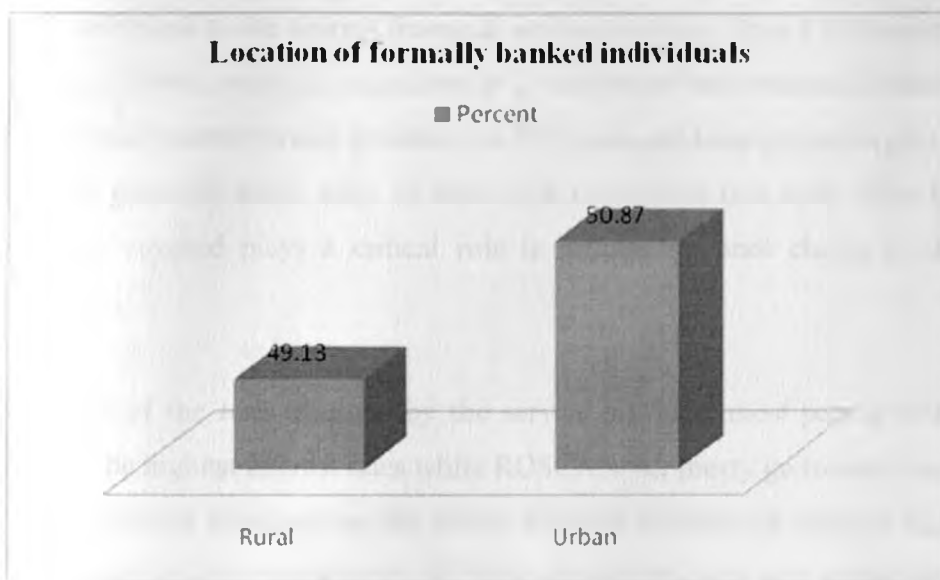


Figure 5: Classification of banked individuals by cluster



The figure above depicts that majority of the sampled individuals who were observed to have borrowed from any financial institution came from the rural areas. This is represented by 63.92% and 36.08% of the 945 for rural and urban respectively.

Figure 6: Classification of formally banked individuals by cluster



Regarding the location of formally banked individuals, slightly more urban dwellers had a formal access to credit than rural dwellers. This is represented by 50.87% and 49.13% for urban and rural respectively. This could be explained by the fact that most formal institutions are found in developed towns where urban dwellers hail from. It is in the rural areas that we are likely to find informal sources of credit like ASCA's, ROSCA's among others. 67.96% of the 4214 sampled respondents hailed from the rural areas.

Table 4: Time taken by formal credit seekers to reach their service provider

Travel time to formal service provider	Freq.	Percent	Cum.
less than 1 hour	179	57.37	57.37
1 hour	78	25.00	82.37
half a day	35	11.22	93.59
a whole day	8	2.56	96.15
more than a day	2	0.64	96.79
you do not travel	10	3.21	100.00
Total	312	100.00	100.00

Of the 312 individuals with credit access from formal sources, 57.37% walked less than one hour to get to the nearest financial service provider. Only 3.21% covered the shortest distance. 0.64% which is equivalent to 2 individuals had to travel for more than a day to get to their nearest service provider. 84.10% took one hour or less to get to their financial service provider while only 15.90% took more than one hour. This implies that the distance covered plays a critical role in influencing ones choice of financial service provider.

In terms of the rates charged by the service provider, most people believe that Banks charge the highest interest rates while ROSCA's like merry go rounds charge the least. Despite having a perception that formal financial institutions charge a higher interest rate as opposed to informal sources, 87.50% who felt this way still settled for a formal loan. Only 12.5% were influenced by the perception to choose a loan other than formal. In aggregate 51.50% of those who felt that interest rates in formal financial institutions are high are banked with any financial institution. Only 7.38% of those who didn't consider the rates to be high are banked. This clearly indicates that interest rate is not a major determinant in choice of credit source.

5.6% of the banked population received some money from friends/family within the country at least once per month while 32.83% received income less often. This shows an inverse relationship between the frequency of income receipt and access to credit. Individuals who receive income less often have more access to loans than those who receive income regularly.

Table 5: Current loan users for specific credit sources

Credit Source	Number	% share
Bank	104	9.17
Sacco	164	14.46
MFI	43	3.79
Government	49	4.32
Employer	47	4.14
ASCA	81	7.14
Family/friends	562	49.56
Informal money lender	36	3.17
Buyer	43	3.79
Building society	5	0.40
Total	1134	100

4.2.2: Econometric Analysis

This section presents the regression results of the estimated model. Using maximum likelihood estimation technique, a bivariate probit model is estimated to establish the probability of accessing credit from formal financial markets given that one is banked. Use of this model is motivated by the assumption that the error terms of the two dependent variables namely, the banked and the formally banked are correlated. The multinomial logit results presents an alternative way of estimating access to credit in Kenya, where one is formally banked, informally banked or financially excluded.

4.2.3: Bivariate probit results

Under the assumption that the error terms are normally distributed, the bivariate probit regression revealed that age, gender and cluster type are negatively related to access to credit. However, the more educated a person is, the more likely it is that the person will be able to access credit. Similarly, the life stage and income have a positive dependence with access to credit.

This study is mainly interested in the marginal effects which give the predicted probabilities. The table below however gives the coefficients which can act as a guide in pointing to the direction or the sign whether a positive or a negative relationship exist. In this case variables like household size, gender where the respondent is male, distance to service provider and the square of age appear to have a negative impact on access to credit. On the other hand location, age, level of education from secondary, marital status where one is married, frequency of receiving income, interest charged by banks and the interaction of age and gender seem to enhance access to credit. This is illustrated in table 6 below.

Table 6: Bivariate probit estimation

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Marginal effects after biprobit							
$y = \text{Pr}(\text{choice}=1, \text{formal}=1)$ (predict)							
= 0.21516974							
Variable	Banked individuals		Formally banked		Marginal effects		
Choice	Coef.	z	Coef.	z	dy/dx	z	Mean
Location	-0.07399	-0.79	-0.02022	-0.2	-0.00591	-0.2	1.42358
Hh size	-0.01867	-0.6	0.023108	0.7	0.006755	0.7	2.67948
Age	0.017184	0.72	0.000315	0.01	9.21E-05	0.01	39.745
Gender	-0.13221	-0.71	-0.08586	-0.42	-0.0251	-0.42	1.46638
Education	0.021174	1.89	0.077545	6.33	0.022668	6.25	9.79039
Marital status	0.055522	1.43	0.134438	3.09	0.0393	3.06	3.32751
Distance	-0.02794	-0.85	-0.01011	-0.28	-0.00296	-0.28	1.78515
Income	0.122525	2.92	0.191607	4.28	0.056011	4.23	2.82795
Age squared	-0.00025	-1.16	-2.5E-05	-0.11	-7.33E-06	-0.11	1775.7
Interest	1.21705	14.01	1.149446	11.05	0.318423	12.78	0.538865
Age_gender	0.01887	0.61	0.020274	0.57	0.005927	0.57	7.99738
Number of obs = 1145							
Wald chi2(22) = 415.91							
Log likelihood = -856.8855							
LR test chi2(1) = 560.787							

The Wald test statistic implies that the parameters or coefficients of the explanatory variables are significantly different from zero, justifying their inclusion in the model. The Wald test assumes a Chi-square distribution. This is also supported by the Likelihood Ratio (LR) test statistic which is also significant. The Log likelihood statistic shows the point at which the sample mean converges to the population mean. In this case it converged after 19 iterations.

The variables, education, marital status, income and interest are significant since the calculated values of z are greater than the critical values. They take 6.25, 3.06, 4.23 and 12.78 respectively.

Given that one is banked, the study tries to investigate the factors which either enhances access to credit from a formal source or those that limit access. In this case, household size, age, level of education, marital status, income, interest charged by formal financial institutions and the interaction of age and gender have a positive relationship to formal credit access. However, location where one hails from an urban area, gender given that one is male, distance from the financial service provider and the square of age appear to have an inverse relationship to formal credit access.

The study is however interested in marginal effects which gives the probability of accessing credit by individuals subject to infinitesimal changes in household characteristics. Looking at the predicted probabilities in table 4.6 above, it is evident that as age increases by 1 year from a mean of 39.75 to 40.75, the probability of accessing credit from a formal source increases marginally. The probability of access to credit by men is also lower than that of women. More women than men have access to credit in Kenya. For men, the probability of accessing credit is 2.5% lower than that of women. This may be explained by the difference in the number of women sampled which was greater than that of men. However, in line with sentiments echoed by Mayada et al (1994) more women than men remain financially excluded. This is reflected in figure 4.4.

As the distance of separation from a service provider increases, the probability of access to credit declines by 0.29%. Married people appear to have a 3.92% higher probability of accessing credit than a non married people. This may partly be explained by the pooling

of incomes by both husband and wife who may now be more endowed such that they can afford to raise collateral for loan.

Regarding the cost of servicing loans expressed in terms of interest rates charged by the financial service providers, persons who consider interest rates from formal financial institutions to be high have their probability of accessing credit being raised by 31.84%. The square of age variable does have much change on the probability of accessing credit. Middle aged men however have a higher probability of accessing credit from formal sources as opposed to the younger men. This is indicated by the interaction of age and gender which gives a 0.59% higher probability.

Access to credit in the formal sector can be explained using the following model;

$$\text{Formal access} = 3.18 - 0.02hh - 1.15r_i + 0.02location - 0.19Y_i - 0.0003A_i + 0.09G_i - 0.02A_iG_i - 0.13M_i - 0.08E_i + 0.01D_i + 0.00002Asq + \varepsilon_i$$

The individual characteristics appear to be influential in determining the level of access to credit and where to access the credit. In this case, the Household size, location where one hails from the urban area, gender and level of education are positively related to credit access from a formal service provider. However, as one grows old, the relationship changes since the individual starts consuming the accumulated savings and therefore has no incentive to borrow. On the contrary, the middle aged persons borrow more to smooth their consumption so that their consumption pattern remains uniform. This is in support of Milton Friedman Permanent Income Hypothesis.

The distance covered to get to the financial service provider is inversely related to the level of credit access. However, the positive sign in the distance coefficient contradicts the existing literature where distance is considered as a limiting factor to credit access since people prefer going to the nearest service provider. This result may be explained by a sampling error or the fact that, more consideration is laid on factors other than distance when deciding on whether to seek credit.

The same is true for interest rates which is a policy variable in this study. High interest rates in the formal sector limit access to credit from the formal financial institutions as people are always rational in their decision making process and therefore prefer more to less at the least cost.

The positive sign for the location imply that individuals who hail from the urban areas have more access to credit from the formal financial service provider than their rural counterparts. This may be explained by the fact that most formal institutions are situated in the urban areas making it much easier for residents in the urban areas to access the credit services.

For marital status, transition from single status to married status leads to reduced access to credit from the formal sector. This is explained by the negative sign of the marital status coefficient. This may be explained by the increased level of integration in the society which makes friends and relatives develop more trust and may encourage informal lending and borrowing.

Number of persons in a household also determines access to credit. It is expected that as the household size increases, so does the demand and access to credit. This could be explained by the increased needs.

Increase in income raises the amount of money available to present as collateral for any loan. When the frequency of receiving income reduces, the income outlay also goes down lowering the possibility of accessing credit. This statement is supported by the negative coefficient of income where individuals who receive income after one month have reduced access to credit from the formal credit service providers.

4.2.5: Multinomial logit estimation

This estimation technique tries to investigate the probability of accessing credit from the formal or informal credit sources. This is aimed at informing on the factors that explain choice of a formal or an informal loan. The variables household size, education, age

squared, interest and the interaction of age and gender are significant. They take values, 1.84, 1.91, 1.2, 8.03 and 1.04 respectively. This is captured in the table below.

Table 7: Access to credit from Formal and Informal Sources

Choice	Formal Pred prob. 0.15649253				Informal Pred prob. 0.19137984				Mean
	Coef.	z	dy/dx	z	coef.	z	dy/dx	z	
Location	-0.11404	-0.59	-0.00907	-0.38	-0.19964	-1.05	-0.02748	-0.98	1.42358
Hh size	0.044074	0.67	0.008987	1.08	-0.10581	-1.62	-0.01769	-1.84	2.67948
Age	0.010029	0.19	0.00071	0.11	0.020502	0.43	0.00287	0.41	39.745
Gender	-0.22386	-0.54	-0.01866	-0.36	-0.36375	-0.96	-0.04959	-0.89	1.46638
Education	0.10772	4.35	0.01481	4.77	-0.01972	-0.88	-0.00628	-1.91	9.79039
Marital status	0.221268	2.6	0.029264	2.73	-0.00185	-0.02	-0.00691	-0.61	3.32751
Distance	-0.01151	-0.16	-0.00025	-0.03	-0.04222	-0.62	-0.00619	-0.61	1.78515
Income	0.395975	4.25	0.051018	4.33	0.041789	0.5	-0.00539	-0.44	2.82795
Age squared	-0.00014	-0.29	-2.04E-06	-0.03	-0.00054	-1.22	-0.00008	-1.2	1775.7
Interest*	2.290599	10.77	0.234016	10.39	1.772642	9.71	0.18679	8.03	0.53887
Age_gender	0.022849	0.32	0.001006	0.11	0.06712	1.07	0.00970	1.04	7.99738
Number of obs =		1145		Log likelihood = -911.88757					
LR chi2(22) =		353.18							
Prob > chi2 =		0.0000							
Pseudo R2 =		0.1622							

The Likelihood Ratio (I.R) test statistic implies that the parameters or coefficients of the explanatory variables are significantly different from zero, justifying their inclusion in the model. It assumes a Chi-square distribution. The pseudo R² postulates that only 16.22 of the variations in the dependent variable have been explained. -911.88757 gives the point at which the function is maximized i.e. the point at which the sample mean converges to the population mean.

A comparative analysis is drawn to assess the probability of an unbanked person accessing either a formal or an informal loan.

Urban individuals have a 0.9% lower probability of accessing credit from a formal lender than their rural counterparts. However, when it comes to credit from an informal lender, their probability of access is reduced further by 2.75%. Increase in household size by one unit lowers the probability of accessing credit from an informal source while it raises the probability of a formal credit access. This is represented by 0.90% and -1.76% for formal and informal respectively.

As the age of an individual increases from 39.75 to 40.75, the probability of accessing credit from a formal and informal source rises by 0.07% and 0.29% respectively. Middle aged persons have a higher probability of accessing credit than elderly persons. At the same time as they grow up and as their living standards improve, people tend to have more preference for formal sources as opposed to informal sources.

More women appear to have greater access to credit in formal institutions than men. This may however be as a result of the high number of women sampled which is higher than that of men. The probability of accessing credit from a formal source by men is 1.87% lower than that of women. A similar trend is found in informal institutions even though the probability is a bit lower since it stands at 4.96% lower probability to that of women. Despite this, more women than men are financially excluded as indicated in figure 4.4.

Advancement in education raises the probability of accessing credit from a formal source by 1.48% while it reduces the reliance on informal loans by 0.63%. Persons without education are generally credit constrained. A general belief exists that, more educated persons are rational in their judgement and only venture in businesses where the returns exceed the risks and therefore are in a better position to repay the extended loans than the uneducated ones.

Married persons have a 2.93% higher probability of accessing credit from a formal source than an informal source. Their probability of accessing credit informally is 0.69% lower

than that of unmarried persons. The pooled incomes may raise the amount of money available to pledge as collateral for a loan. The institution of marriage is also highly regarded in the contemporary society and therefore married persons are trusted more.

Distance from the financial service provider reduces the probability of accessing credit in both the formal and informal sources. However, the probability of accessing credit from an informal source is reduced by a bigger margin. This takes values of 0.03% and 0.62% for formal and informal sources respectively. It is widely expected that informal credit facilities are more customised and tailored to customer needs. The same applies for the location of informal service providers. Where the facilities are located a far distance away, the customers may opt for formal sources as opposed to informal sources.

Regarding the main activity that earns income to an individual, movement from self employment to waged/employed status raises the probability of accessing credit from the formal source by 5.1% while it lowers the probability of accessing credit from informal source by 0.54%. This could be explained by the fact that formal financial institutions base their credit facilities on the ability to pay which is explained by the frequency with which a person earns income. For the informal sector, income is not a major factor since the degree of societal integration is what matters most.

Regarding the interaction of the age and gender of a person, men in the upper age groups remain constrained although the degree of being constrained is greatly reduced. The probability of accessing credit from formal and informal sources increases by 0.1% and 0.98% respectively.

As the age of a person increases, the probability of accessing credit from both the formal and informal source reduces although the change in access is almost insignificant since it is almost zero. This is explained by the fact that old people rely on accumulated savings rather than fresh borrowings especially where they have reached their retirement age and therefore they are not eligible for loans since they may not be in a position to repay the extended loans.

Contrary to expectations, interest rates in the formal financial sector appear to have a positive impact on credit access. For persons who consider interest rates in formal financial markets to be high, their probability of accessing credit from a formal financial institution remains higher than that of informal institutions. This is represented by 23.40% and 18.68% for formal and informal respectively.

CHAPTER FIVE: CONCLUSIONS AND POLICY IMPLICATIONS

5.1: Conclusions

The main aim of this study was to investigate the determinants of access to credit by individuals in Kenya. In particular the study aimed at investigating the factors that enhance access to credit and those that limit access. This was based on the fact that only 22% of the total sampled population have access to credit, 36% of whom use credit from formal sources while 64% rely on informal sources. 78% of the total sampled population were found to be credit constrained.

This study has established that indeed individual demographic and socioeconomic characteristics influence ones access to credit. Looking at gender, regression results indicate that more women than men have access to credit. This is especially so in the formal financial institutions. However, the numbers of women who are financially excluded remain higher than that of men

The age of a person appear to have a quadratic relationship with the middle aged persons having a higher access than the elderly persons. However the change in access to credit is insignificant as ones grows old. Similarly, the more educated persons have a higher access to credit than the uneducated persons. Persons with higher education were observed to have increased access to credit.

Interest rates ought to have a negative relationship with credit access due to the increased cost. This study established that interest rates are not a major factor which influences access to credit. Despite the perception that interest rate especially in formal financial institutions were high, access to credit from such institutions remained high.

Distance on the other hand served as a hindrance to accessing credit since individuals prefer walking shorter distances. Access to credit is reduced for both formal and informal credit although the reduction is bigger in the informal credit service providers.

Individuals would therefore prefer to cover short distances to get to their financial service provider.

5.2: Policy Implications

This study focused on the determinants of access to credit in Kenya and particularly centred on the two main classifications of financial institutions namely the formal and informal. The study established that despite the spirited campaigns stepped up by the government to raise access, more remains to be done.

Of the total sampled population, only 22.43% are banked in Kenya. Out of the banked population, 36.4% bank with formal financial institutions while 63.6% bank with informal financial institutions. This portrays that more people have a strong preference for the informal credit service providers. Little has been done in evaluating the role played by the informal sector besides putting some regulatory measures. There is therefore need to introduce an Act of Parliament that will see the operations in the informal sector governed and regulated like in the formal sector.

Economic empowerment of masses is very important in any economy. This can be enhanced through increased participation in the labour markets as a result of increased creation of jobs and self employment. This will help in raising income which could in turn be used as collateral when applying for loans. The government must therefore step in to ensure that more jobs are created and for the self employed, the government should ensure that raw materials are acquired at affordable prices besides creating markets for the finished goods. Since rural residents rely heavily on agricultural produce, the government should provide subsidies for the farm inputs and introduce high yielding and fast maturing crops so that the frequency of receiving earnings can be raised.

Regarding the cost of credit, 78.31% of the banked population consider interest rates in the formal institutions to be high. This limits the degree of accessing credit. The government must therefore put up measures to ensure that the interest rate spread between the deposit and lending rates is reasonable to prevent exploitation of the

customers. Since domestic borrowing crowds out private investments due to the increased interest rates, the government should resort to other mechanisms to bridge the budget deficit other than use of the contractionary monetary policy. The government must also encourage increased production and which will ultimately lead to self sustenance and reduce dependence on imports. This however calls for adequate measures like introduction of irrigation schemes which will see agricultural production increasing. Besides, the government should encourage shift from overreliance on primary exports like tea and coffee to other products.

Besides smoothing consumption, credit serves to boost production and investments. Farmers therefore rely on credit to purchase farm implements and equipments as well as the raw seeds and fertilizer. The government should therefore help fund the establishment of credit programmes designed to finance farmers. Besides the government should introduce loan facilities for farmers and issue them at concessionary rates.

Reforms should also be instituted in the financial sector to avoid collapse of financial institutions since this may lead to huge losses as well as loss of trust in the financial system. Some of the stiff requirements which include licences which are expensive to acquire should be scrapped to encourage more people to venture in this market. However, this must be accompanied by rules and regulations to avoid exploitation of unsuspecting customers by investors out there to defraud people.

Since education enhances access to credit, the government must ensure that the free primary education is extended to secondary and tertiary levels since this will lower the unbanked population. The government should be ready to support the bright students without the financial capacity to pay fees. This can be done by increasing the money allocated towards bursary funds. The CDF funds also need to be monitored to ensure that students benefit from the same. More tertiary institutions should also be established. In doing this, the government must ensure that courses under study are relevant and applicable outside the classes so that more people can employ themselves given the knowledge acquired.

5.3: Recommendations for further research

- Significance of the informal financial sector in Kenya
- Distinguishing criteria between formal financial markets and informal financial markets
- The banking status in Kenya factoring in the distinct characteristics of various regions

5.4: Limitations of the study

- The main challenge in this study emanated from the small number of banked individuals especially for various sources of credit like government and microfinance institutions. This greatly limited the analysis of the institutions using estimations like multinomial logit which could have seen this study present the probability of accessing credit from specific institutions.
- Most variables under study were captured as dummy variables and this greatly limited the analysis of various aspects without falling into dummy traps.
- Certain variables like income and interest rates were not captured well necessitating the use of proxies to capture the variables.

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APPENDICES

Annex I. Table of Choice of credit source based on age

respondent age	Choice		
	Unbanked	Banked	Total
18 - 24 years	741	156	897
25 - 29 years	522	152	674
30 - 34 years	440	143	583
35 - 39 years	340	141	481
40 - 44 years	296	99	395
45 - 49 years	225	82	307
50 - 54 years	179	58	237
55 - 59 years	138	44	182
60 - 64 years	119	25	144
65+ years	269	45	314
Total	3269	945	4214

Annex II: Choice of formal loan

Respondent age bracket	Formally banked	Total
18 - 24 years	32	32
25 - 29 years	46	46
30 - 34 years	57	57
35 - 39 years	71	71
40 - 44 years	40	40
45 - 49 years	41	41
50 - 54 years	23	23
55 - 59 years	16	16
60 - 64 years	8	8
65+ years	10	10
Total	344	344