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The Influence of Social Capital Dimensions on Household Participation in Micro-Credit Groups and Loan Repayment Performance in Uasin Gishu County, Kenya

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THE INFLUENCE OF SOCIAL CAPITAL DIMENSIONS ON HOUSEHOLD PARTICIPATION IN MICRO-CREDIT GROUPS AND LOAN REPAYMENT PERFORMANCE IN UASIN GISHU COUNTY, KENYA

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A Thesis Submitted to the Graduate School in Partial Fulfillment for the Requirements of the Master of Science Degree in Agricultural and Applied Economics of Egerton University

EGERTON UNIVERSITY

APRIL, 2013

DECLARATION AND APPROVAL

I declare that this thesis is my original work and has not been presented in this or any other university for the award of any Degree or Diploma.

Signature ------------------------------------- Date--

Kangogo Daniel Kipkurui

KM17/2718/10

APPROVAL

This thesis has been presented to the Graduate School for examination with our approval as university supervisors.

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DEDICATION

I dedicate this work to my parents Mr. Francis K. Tibai and Mrs. Esther Kangogo, brothers and sisters for their sincere support and understanding during my study period.

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ABSTRACT

Lack of access to credit is a key obstacle for economic development of transitional economies such as Kenya. The underlying problem is related to information asymmetry combined with the lack of collateral by low income households. Microfinance led group lending model offer a new way to deal with this problem without resorting to collateral requirements. The core issue in group lending is that it systematically exploits elements of social capital that inherently exist in groups into an incentive contract that substitutes collateral; a formal bank conventional requirement of lending that is virtually unavailable to the poor. This study sought to ascertain the influence of social capital dimensions on households' participation and repayment performance in micro-credit groups in the study area. The study was conducted in Moiben Division, Uasin Gishu County, Kenya based on a sample of 174 households selected using a multi-stage sampling technique. The data was collected using a personally administered structured questionnaire. In the analysis descriptive statistics, Heckman two stage and a Tobit regression models were employed. The results show that individual and group borrowers had significant differences in gender, age, farm size, years of education, income and land tenure. It was established that household size, farm income and distance to the nearest financial institution positively influenced a household to join micro-credit group. On the other hand age, gender, years of education, farm size and interest rate were found to be significant and negatively influenced household decision to join micro-credit groups. The level of household participation in micro-credit groups measured by the number of loan borrowings was significantly and positively influenced by age, total income, years of experience in group borrowing and decision making index while farm size, heterogeneity index and density of membership had a negative affect on household number of loan borrowings. Lastly, the results on group loan repayment performance using the Tobit model revealed that experience in group borrowing, number of visits by loan officer, peer pressure, meeting attendance index and heterogeneity index positively and significantly influenced loan default rate while gender, household size, distance to the nearest financial institution and density of membership were significant but negatively influenced household loan repayment performance. The study therefore recommends that MFIs should increase awareness and encourage poor households to form micro-credit groups. These institutions are obliged to provide training to households on group dynamics in order to take advantage of social capital existing within well organized and managed groups.

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LIST OF ABBREVIATIONS

AERC   - African Economic Research Consortium

AFC   - Agricultural Finance Corporation

ASCAs   - Accumulating Savings and Credit Associations

CBK   - Central Bank of Kenya

FAO   - Food and Agriculture Organization

FSD   - Financial Sector Deepening

GDP   - Gross Domestic Product

Ha   - Hectares

IMR   - Inverse Mills Ratio

KES   - Kenya shillings

Km   - Kilometers

K-Rep   - Kenya Rural Enterprise Programme

KWFT   - Kenya Women Finance Trust

MFC   - Micro-finance Credit

MFIs   - Microfinance Institutions

MLE   - Maximun Likelihood Estimation

PRIDE   - Promotion of Rural Initiatives and Development Enterprises.

RoK   - Republic of Kenya

ROSCAs   - Rotating Savings and Credit Associations

SACCO   - Savings and Credit Cooperative Societies

SMEP   - Small and Micro Enterprise Programme

SMEs   - Small and medium enterpises

WEDCO   - Women Development Company

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Access to credit is known to accelerate household and national economic development (Pederso, 2003; FAO, 2006). Recent financial access surveys show that access to credit is a major problem especially in the rural areas (FSD, 2006 and CBK, 2009). The 2009 survey showed that 50 percent of the rural individuals had never used any credit service compared to 61.7 percent in 2006. In particular the rural households who face limited access to credit have volatile and relatively low incomes and majority of them engage in agriculture for food, income generation and meeting other household financial obligations (Petrick, 2002). These households suffer from income shocks due to fluctuations in weather and consumption prices aggravated by seasonality in crop production. Such households try to smooth income and reduce risk by diversifying economic activities.

In Kenya, access to credit particularly remains a mirage to a majority of the growing population. Combined to those who have access to microfinance institutions (MFIs) and Savings and Credit Cooperative Societies (SACCOs), more than half of the adult population is excluded from formal bank credit (CBK, 2009). According to FSD (2009) about 60.4 percent of the Kenyan population do not have access to credit markets. Viewed against a growing evidence of rising cost of living, low or no access to credit inhibits both investment and consumption smoothing thus accelerating poverty levels. This lack of access to credit by poor rural households has negative consequences for agricultural and non-agricultural productivity, income generation and household welfare (Diagne and Zeller, 2001). The situation threatens the capacity of the poor rural households in their quest for sustainable production and enterprise expansion.

Access to financial resources is constrained by both internal and external factors. Internally, small scale households lack creditworthiness and management capacity, hence have trouble securing funds for their activities such as procuring raw materials, agricultural inputs, farm mechanisation, adoption of improved agricultural technologies and investing in plant and equipment. From the external perspective, they are regarded as insecure and costly entities to deal with because they lack required collateral and have the capacity to absorb only small amount of funds from financial institutions. They are consequently rationed out in their access to credit because of high intermediation costs, including the cost of monitoring and enforcement of loan contracts.

To take care of the financial needs of low income households, a number of alternatives institutions to bank credit have emerged. These include MFIs, SACCOs, Accumulating Savings and Credit Associations (ASCAs), government, employers, informal lenders, buyers of harvest, local shops and family/friends. MFIs particularly have an advantage over traditional banks and largely favour Small Medium Enterprises (SMEs) since they are unable to meet conventional bank criteria such as producing tangible collaterals. Instead, MFIs depend on cash-flow based lending, credit scoring, prior lending experience with the client and group lending which gives them a competitive edge over conventional banks. Despite this the main challenges facing MFIs are lack of credit lines and high cost of their credit to potential borrowers.

This study focuses on the group lending approach which is aimed at providing credit to individual members of a micro-credit group. Group lending approach makes use of group guarantee mechanism making loans accessible to the low income households who lack collaterals (Mejeha and Ifenkwe, 2007). The approach has existed and continue to exist in Kenya with the latest being government led women and youth enterpise funds. These were designed to improve credit access to women and the youth who tend to be marginalized by formal credit markets (RoK, 2006). Group lending approach has led to emergence of MFIs that lend through groups to overcome collateral problems (Mosley, 1996; Ouma, 2002). Institutions using this model in Kenya include Promotion of Rural Initiatives and Development Enterprises Limited (PRIDE), Kenya Women Finance Trust (KWFT), Faulu Kenya, Kenya Rural Enterprise Programme (K-Rep), Women Development Company (WEDCO), Small and Micro Enterprise Programme (SMEP) among others (RoK, 2006). According to (Zeller *et al.,* 2002) and Ghalak (1999) the unique feature of associating creditworthiness with membership of a group increases peer pressure for loan repayment while membership restrictions provides enough collateral for the financial institutions. Similar institutions such as Grameen Bank in Bangladesh and BancoSol in Bolivia have recorded considerable success in delivering credit to the poor members of the society (Armendariz and Morduch, 2005).

The success of group lending approach in accessing credit and lowering default rates relies heavily on social capital (Grootaert, 1999). In group lending approach, microfinance institutions extend credit to individuals in a group with greater value attached on organized groups depicting the importance of social capital. The MFIs rely heavily on the notion that borrowers can utilize their social capital to overcome problems such as adverse selection, moral hazard, and contract enforcement associated with asymmetric information in credit

markets (Gomez and Santor, 2001). Social capital is defined by Narayan and Woolcock (2000) as the intangible norms and networks that enable people to act collectively especially in the rural areas. These intangible resources include amount of expectations and obligations linked to being member of a group. The underlying dimensions are the characteristics of the social relationships of individuals that will shape their set of expectations, obligations and finally influence their capacity to coordinate, cooperate and to engage in any form of exchange.

The fundamental function attributed to social capital is the ability of people to group together to obtain some collective benefit. These benefits are for the entire group as well as captured by individuals within the group (Warren, 2008). Mwangi and Ouma (2012) demonstrated that social capital enables people to attach greater value in their groups which facilitate collective action. This is because a group is comprised of people who interact directly, frequently and in multi-faceted ways (Bowels and Gintis, 2002). Groups lower uncertainty and reduce transaction costs thereby fostering economic activity at the micro level, while at the same time providing a new analytical tool to explain some macro phenomena like rural development differentials. As argued by Pitt and Khandker (1998), the level of attachment, social ties and integration is very high in the rural areas. This could be partly explained by the degree of homogeneity in the economic activities that people engage in, the family ties as well as the cultural practice. Credit groups enable access to private information unavailable to credit markets, monitor members' behaviour and punish individual members who go against the social norms (loan defaulters). According to Mwangi and Ouma (2012) sharing information among group members reduces transactions costs, the sense of belonging facilitates collective decision making while the solidarity and reciprocity that emerge from the networks diminish opportunistic behavior.

Putnam (1993) demonstrated that social capital has quantifiable effects on different aspects of human beings using different proxies. Narayan and Pritchett (1997) developed a number of indicators/dimensions related to village associations, activities, norms and trust. These indicators include density of membership, group heterogeneity, member cash contribution, member labour contribution, meeting attendance and participation in group decision making. Existence of these dimensions bind groups of borrowers together as a form of social collateral. Any deviation from the norms guiding the group may lead to sanctions or exclusion (Mwangi and Ouma, 2012). Accordingly, groups substitute the traditional collateral and poor legal frameworks required in enforcing loan contracts, both of which keep them away from accessing formal credit.

Majority of the small-scale households in Uasin Gishu County suffer from limited access to formal credit due to lack of collaterals. Joining micro-credit groups presents an option to increase access to credit and improve loan repayment performance. This is exhibited by the proliferation of micro-credit groups all over the County though a number of these groups have been dissolved due to loan default (Keror, 2012). For most of them belonging to a micro-credit group is thought to boost their credit worthiness and improve repayment performance. This study was designed to establish the role of social capital in enhancing access to credit and improving repayment performance for households in Uasin Gishu County.

1.2 Statement of the Problem

One of the major obstacles facing rural development in the transition economies is the limited access to financial capital by the low income households for micro and small business and small scale commercial farming. Until the establishment of MFIs, the entrepreneurial initiatives of the low income households were hampered since most of them were excluded from the formal credit market. As a consequence, they were either not able to be self-employed, or, if they had started their own businesses they were not able to expand it to a size sufficient to generate income above the poverty line. To tackle the this problem new lending approaches have been developed and implemented by specialized MFIs. Group lending is one such approach that has gained considerable success in increasing low income household access to credit and improving loan repayment performance in Kenya. However, while there exist a good number of micro-credit groups in Uasin Gishu County, little is known about the social capital dimensions that influence household participation in micro-credit groups and loan repayment performance. Other factors influencing the decision of households to join micro-credit groups need also be understood. It is therefore imperative to explore the influence of social capital dimensions on micro-credit groups in the County.

1.3 Objectives of the Study

1.3.1 General Objective

To assess the influence of social capital dimensions in improving credit access and repayment performance in micro-credit groups which contributes to the rural development in Uasin Gishu County.

1.3.2 Specific Objectives

i.   To characterize the socio-economic attributes of the micro-credit group and individual borrowers in Uasin Gishu County.

ii.   To determine the factors influencing household participation and level of participation in micro-credit groups.

iii.   To determine the influence of social capital dimensions, socio-economic and institutional factors on household repayment performance under group borrowing scheme.

1.4 Hypotheses

i.   The socio-economic characteristics of micro-credit group borrowers are not significantly different from those of individual borrowers.

ii.   Social capital dimensions, socio-economic and institutional factors do not significantly influence household participation and level of participation in micro-credit groups.

iii.   No social capital dimension, socio-economic or institutional factor has a statistically significant influence on household repayment performance under group borrowing scheme.

1.5 Justification of the Study

Since majority of the small and medium enterpises (SMEs) do not have easy access to formal credit due to lack of collaterals, group lending comes in handy through formation of micro-credit groups. These groups are strengthened by existence social capital. It is therefore vital to conduct an empirical study geared towards analyzing the influence of social capital dimensions and other factors that drive small-scale households towards participation in such a program to get a better understanding of the program's effects on household access to credit and repayment performance.

These group lending schemes are fairly new with many initiated recently, therefore there are few studies on the impacts of the strategy on participants' access to credit and repayment performance (Microcredit Summit, 1997). This creates an information gap which the study tries to fill especially on the influence of social capital dimensions on household participation in micro-credit groups and the effect on repayment performance. The empirical findings will serve to guide the policy makers and other stakeholders involved in such programs on appropriate interventions to support small-scale households improve their

livelihood. The study may also be used by MFIs to assess whether they have achieved their objective to increase household access to credit and improve their loan recovery which is key in determining sustainability of the program.

1.6 Scope and Limitation of the Study

The study was confined to getting information on the influence of social capital dimensions on micro-credit groups in Uasin Gishu County. It is a small geographical area of the country, hence the results may not apply to others areas. The study mainly focused on the influnce social capital dimensions on participation in micro-credit groups and its implications on credit repayment performance, therefore setting a boundary for the study. It is also important to mention that social capital is diverse and broad. Given that social capital is broad and involves diverse fields, disciplines and area specific, not all issues relating to it were explored. In addition illiteracy, lack of proper record keeping by groups and questions on social capital may lacked exact answers.

1.7 Definition of Terms

Adverse selection- A situation which occurs when a product or service is selected by only a certain group of people who offer the worst return for the company. It occurs in most cases because of information asymmetries.

Asymmetric information- situation in which one party to a transaction has more or better information about the transaction than the other.

Collateral- Something pledged by a borrower to secure a loan or credit, and subject to seizure in the event of default, also called security.

Credit rationing- refers to a measure employed by lending institutions to limit lending based on determinations they make about the credit-worthiness of borrowers as well as the lending environment in general.

Group borrowing- a situation whereby individuals form groups with the intention of borrowing. In this case, group members are jointly accountable for the repayment in the event of default. Therefore, the whole group provide enforcement mechanism as group members put pressure on borrowing members to repay their loans.

Individual borrowing- a situation where individuals borrow directly from the financial instituon without forming any group.

Micro-credit group- a group formed for the purpose of gaining access to credit. It includes women groups, youth groups and other self-help groups (SHGs).

Microfinance- the provision of financial services to the poor, low income households usually lacking access to formal financial institutions.

Moral hazard- refers a situation where a party is more willing to take a risk, knowing that the potential costs or burdens of taking such risk will be borne, in whole or in part, by others.

Peer pressure- refers to the influence exerted by a peer group in encouraging a person to change his or her attitudes, values, or behavior in order to conform to group norms.

Social capital- defined for this study as the formal and informal linkages of rural inhabitants through local organizations/groups in rural areas.

CHAPTER TWO

LITERATURE REVIEW

2.1 Microfinance Definition

Microfinance, according to Otero (1999) refers to the provision of financial services to low-income poor and very poor self-employed people. These financial services according to Ledgerwood (1999) generally include savings and credit but can also include other financial services such as insurance and payment services. Schreiner and Colombet (2001) define microfinance as the attempt to improve access to small loans and small deposits for poor households neglected by banks. Therefore, microfinance involves the provision of financial services such as savings, loans and insurance to poor people living in both urban and rural settings who are unable to obtain such services from the formal financial sector.

2.2 Microfinance and Microcredit

In the literature, the terms microcredit and microfinance are often used interchangeably, but it is important to highlight the difference between them because both terms are often confused. According to Sinha (1998) microcredit refers specifically to small loans, whereas microfinance refers to a situation where NGOs and MFIs supplement the loans with other financial services such as savings and insurance. Therefore microcredit is a component of microfinance in that it involves providing credit to the poor, but microfinance involves additional non-credit financial services such as savings, insurance, pensions and payment services (Okio, 2005).

2.3 Microfinance Lending Models

With the evolution of microfinance concept, a number of microfinance lending models have evolved over time. The Grameen Bank (2000) has identified eight different microfinance models which includes associations, cooperatives, credit unions, individual lending, group lending, Grameen model, rotating savings and credit associations and village banking. This study focused on the individual lending model and group lending model since these are the two main microfinance models prevalent in Kenya.

2.3.1 Individual Lending Model

This is a straight forward credit lending model where loans are given directly to the individual borrowers. It does not include the formation of groups, or generating peer pressures to ensure repayment. In this model MFIs provide loans to individual borrowers

based on their own personal credit worthiness, past performance, viability of business propositions, client's income sources and business position. It is more prevalent with clients who generally need bigger size loans and have the capacity to produce collaterals. The individual approach is commonly associated with commercial banks.

2.3.2 Group Lending Model

The group lending model is based on group peer pressure whereby loans are made to individuals who must belong to a micro-credit group. Group members collectively guarantee loan repayment, and access to subsequent loans is dependent on successful repayment by all group members. The model basic philosophy lies on the fact that shortcomings and weaknesses of the individual lending are overcome by the collective responsibility and security afforded by the formation of a group of such individuals. The collective coming together of individual members is used for a number of purposes including education and awareness building, collective bargaining power and peer pressure. According to Berenbach and Guzman (1994), group lending has proved effective in deterring defaults as evidenced by loan repayment rates attained by the Grameen bank in Bangladesh.

2.4 The Concept of Social Capital and its Measurement

Social capital is a multidimensional concept that reflects the complex system of formal and informal organizations in any society. When examining social capital it is necessary to indicate which dimension and level of reference. Community social capital is measured through networking activities in a village which reflects the intensity of social interactions that reduce, if not suppress, free-riding (Hayami, 2009). The focus in this study is on the social capital dimensions of micro-credit groups at the village level, in line with empirical studies that use similar measures to investigate relationships between social capital and household expenditures (Narayan and Pritchett, 1997). However, Nahapiet and Ghoshal (1998) offers an alternative typology, distinguishing between the structural, relational and cognitive dimensions of social capital. Their emphasis was on the relationship between groups and the service providers and less emphasis was on the relationship between group members. In the study of Narayan and Pritchett (1997) social capital dimensions include, membership heterogeneity, frequency of meetings, member contribution, participation in decision making and density of memberships. Stemming from the work of Narayan and Pritchett (1997) this study adopts their measurement units of social capital dimensions since the present emphasis is on the relationship between micro-credit group borrowers, how it affects household access to credit and group loan repayment performance.

Studies from the Local Level Institutions studies examined social capital and local institutions in Bolivia (Grootaert and Narayan, 2000) and Burkina Faso (Grootaert *et al.,* 2002). These studies were done in an identical manner to the work Grootaert (1999) using the five dimensions of social capital as stipulated by Narayan and Pritchett 1997. However, in the study of Burkina Faso a sixth dimension community orientation was added, this examined whether the organization was instituted by comminuty members or imposed by donors/MFIs. In this study, the variable community orientation was dropped since it was found that all the groups were started by community members, none was imposed to then by MFIs.

While social capital is relational, its influence is most profound when relationships are among heterogeneous groups. From an economic perspective, studies conducted as part of the World Bank's Local Level Institutions Study (Grootaert and Narayan, 2000) confirm the importance of heterogeneity in group membership when using the dimensions adopted from Narayan and Pritchett (1997). This pattern of results is also found in rural Tanzania (Narayan and Pritchett, 19997), in Indonesia (Grootaert, 1999) and in rural Bolivia (Grootaert and Narayan, 2000). It is not simply an issue of the extent to which people are connected to others, but the nature of those connections. The heterogeneity variable measured similar to the work of Narayan and Pritchett (1997) was also added in this study to find out its influence on level of participation in micro-credit groups and group loan repayment performance. In contrast to the work of (Grootaert and Narayan, 2000) Cassar *et al.,* 2007 found that group homogeneity within groups has a positive effect on group performance specifically their results support the idea that group homogeneity is likely to exert a positive influence on loan repayment.

During group scheduled meetings several activities occur including, loan payments, group cash contribution, issuing new loans, training in group operations and the importance of group solidarity, and monitoring of loan repayment by all members (Karlan, 2006). Attending group meetings according to Lasagni and Lollo (2011) raises social capital because the repetition of interactions is the funding element of reciprocity among individuals. Expectations and obligations will build up and evolve together with interaction. This indicate that the higher the frequency of meetings the clearer the set of expectations and obligations between group members. In coherence with this finding, Okunmadewa *et al.* (2007), Yusuf (2008) and Lawal *et al.* (2009) found that households who regularly attend group meetings are better positioned to obtain credit than others that do not. This variable was used in this study to ascertain its influence on access to credit and loan repayment performance.

Prior literature has indicated that the more the number of groups one subscribes to, the higher the probability of accessing an informal loan (Mwangi and Ouma, 2012). This is in line with the view of Grootaert (1999) and Yusuf (2008), that additional memberships of households in associations increases the probability of access to credit at local level institutions. Conversely, Balogun and Yusuf (2011) argue that households' density of memberships index decreases the probability of obtaining credit from cooperative, governmental agency and friends and family implying that density of membership associations alone is not sufficient condition to obtain credit from these sources. This study incoporates the variable generated as per Narayan and Pritchett (1997) to establish the influence on number of borrowings and the group loan repayment performance.

It is widely recognized that efficient and equitable groups are those that allow participation of members in the decision making processes, as well as the sharing of benefits and costs (Tabi, 2009). Where this is possible different segments of the society feel the need to pool resources within groups which heightens the effect of social capital. In Indonesia for example, participation in group decision making correlates positively with household access to credit (Okten and Osili, 2004). Grootaert (1999) in his study noted that an increase in the participation would give a higher expenditure level. Similarly, Grootaert and Narayan (2000) found that households who actively participate in decision making profit more than others. On the other hand Yusuf (2008) found that active participation in decision making actually dampens welfare whereby high level of commitment to associations reduces household welfare. Using a similar decision making index as generated in the work of Yusuf (2008) this study sought to find out whether active participation in decision making had different implication on both number of borrowings and group loan repayment performance.

Cash contribution is common to people participating in economic-related, spiritual and environmental related groups. It is hypothesized that groups that demand a larger cash contribution from its members will experience good repayment performance since the contributions can be used to repay loans in case of default by a member. Notwithstanding this large cash requirement may discourage members from joining the group. According to Ajani and Tijani (2009) cash contribution to groups or associations by households increases the probability of access to credit. On the contrary, Grootaert (1999) study in Indonesia revealed negative coefficients of the cash and work contribution variables on household welfare. This meant that the poorest households participate more actively in social groups, including making larger contributions in cash and in kind. This clearly brings out the importance which the poor attach to these organizations. Presumably, the rich have less need to associate in

groups. Differing from the work of Grootaert (1999) the present study makes use of cash element of contribution and drops out the labour contribution since it was found that micro-credit groups do not require members to provide labour contribution.

2.5 Determinants of Households' Participation and Level of Participation in Micro-credit Groups

A household participates in micro-finance programme, if it actually borrows from that source of credit (Diagne and Zeller, 2001). A study on the participation of a rural household in Self Help Group (SHG) in Andhra Pradesh and Uttar Pradesh using probit model revealed that the households' total income was a significant factor in influencing the probability of household participation in SHG (Basu and Srivastava, 2005). Similarly, using Heckman selection and double hurdle models, Duy (2012) showed that total income was a critical factor that influenced households to join group-based borrowing and the amount of loan borrowed. The finding indicated a statistical difference in the total income of individual borrowers and group-based borrowers. Total household income which is the sum of off-farm and farm income is thus expected to have a positive influence on household to join micro-credit group and the number of times borrowed.

Owour (2009) employed a propensity score matching method to evaluate effects of micro-finance credit (MFC) on borrower's productive performance in Kenya. The findings revealed that participation in MFC improved household productive incomes by a range of between US$ 200 and US$ 260 in a single production period. Using ordinary regression to find out the implication of group lending on poverty levels (Olomola, 2002) found participation in group lending to have no influence on poverty levels in Nigeria. A study by Kinuthia *et al.* (2011) evaluated factors influencing participation in tree planting program and the extent of participation measured in acreage allocation in Nyeri district, Kenya. They employed Heckman two stage sample selection model in analysis to deal with the self selection problem. Similarly, to correct selection bias problem, this study employed Heckman selection model to determine the social capital dimensions and other factors that influence household access to group loans. It is expected that participation in micro-credit group will influence household access to credit measured by the numbers of loans.

Nguyen (2007) applied Probit model to estimate credit program participation and Tobit model to estimate loan amount received. By separating the source of loan, Nguyen expected that the determinants of credit participation would be different as the eligible requirements for borrowing are different between sources. The findings showed that number

of members in a household was found to have a large and significant effect on credit participation, especially from formal source. Using a binary logistic regression model (Aqsa *et al.,* 2005) found comparable results where household sizehad a positive and significant influence on household access to credit and participation in credit program in Pakistan and Fadama II group project in Nigeria. These studies suggest that individuals with large household size were likely to participate in programmes as they have more family burden to contain with, in terms of social and economic services, and therefore need support to meet their family daily needs. In contrast Ha (1999) found that household size has a negative effect on the probability to borrow as well as on the amount borrowed. This uncertainty of household size group participation arises because an increase in household size would not only help to increase labour income and diversify income sources and but also increase demand for consumption and other basic needs (Nagarajan and Schreiner, 1998). Using Heckman selection model this study seeks to ascertain whether household size has any influence on household participation and number of loans in micro-credit groups in Kenya.

It is often believed that higher education gives households the ability to perceive, interpret and respond to new information faster than their counterparts with lower education (Feder *et al*., 1985). Khandker (2005) using a multiple regression model indicated a negative relationship between education of households and participation in credit programs. These results were consistent with Nguyen (2007) who found education to be negatively related to credit program participation using a probit model. However, using logit model Zaman (1996) found educational variable measured by average years of schooling, to have no influence on the depth of participation in micro-credit programs. Awunyo-vitor *et al.,* 2012 found that increase in years of schooling is associated with women participation in microcredit. It is, therefore, established that higher education fosters participation in microcredit. Using probit model in the first stage of Heckman selection model this study seeks to find out the influence of years of education on household participation in micro-credit groups.

Gender of the borrower is hypothesized to have a positive relationship to micro-credit group participation because female are disadvantaged compared to the male in terms of collaterals. According to Barslund and Tarp (2007) and Nguyen (2007) there is no gender bias in microcredit participation in the peri-urban areas in contrast to what is in rural Vietnam. This is consistent to the findings of Doan *et al.* (2010) using Tobit model that gender does not really matter in credit participation but it plays a role in explaining loan size. Their findings showed that male-headed households received lower amounts of loans than female headed households. The finding is contrary to the common trend in developing

countries because females are often involved in small businesses which need smaller loans (Armendariz and Morduch, 2005). Similar findings have been found by Owour (2009) who indicated immense involvement of women in rural economy as well as the fact that women get more attracted to micro-credit groups that peg no tangible credit to lending, reason being that a majority of women in Africa still lack right to property to hold as collateral against credit.

Literature on age of the borrower is diverse, Anjugam and Ramasamy (2007) using Probit model found age to have a negative influence in explaining women participation in the microfinance programme in their case, as the age of women increased by the probability of participation of women in the microfinance programme decreased by per cent, indicating that as the age of women increased, they could not participate in the programme effectively. Ha, 1999 using logit model found age to negatively influence the probability of credit participation, but it has a positive effect on loan size. This is corroborates with results of (Duy, 2012) using double hurdle model who found age to have no influence on decision to borrow but significantly influenced the amount borrowed. Further conformity has been revealed by Doan *et al.,* 2010 where age of household head has a positive effect on loan size. In their finding the relatively older households tend to receive greater loans, since younger households have a smaller labour force, and hence have lower ability to earn and repay.

Land size can be used as a proxy for wealth and due to its centrality it is an important determinant of mode of borrowing to be chosen by a household. Land holding size display a significant impact on household borrowing activities. However literature on the influence of land size on group participation and level of particpation is mixed. According to Diagne (1999) higher share of land was negatively correlated with the access to formal credit. Nguyen (2007) using both Probit and Tobit regression found the coefficient of land holding size and household assets which are the most used collateral to be significant and affected credit programme participation. In the study by (Bokosi and Fredrick, 2004) small landholder farmers were found to be too poor to benefit from formal credit, group guarantee mechanism ensured that they had access to adequate credit and inputs. Zaman (1996) using the land data in Bangladesh suggests the ultra poor do take part in credit groups while the relative lack of participation of female headed households suggests that land is the barrier to entry for the most vulnerable in society. Similar results have been found by (Izumida and Pham, 2002). Duy (2012) using Heckman two step procedure found total land size to be significant in determining both household participation in credit programme and the size loan. This study

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makes use of farm size variable in hectares to determine its influence on group participation and level of participation.

Interest rate is of great concern in determining both the participation and level of participation in credit groups (Khanh, 2011). The dominance of plurality of interest rates in the informal credit markets is still confusing (Gill, 2003). In rural settings of Pakistan, the interest rate charged by moneylenders was 40% per annum (Aleem, 1990). Evidence from India showed that informal interest rate varied from 20% to 120% (Timberg and Aiyar, 1984) the high interest charged in Pakistan and India could explain why micro-credit groups are widespread in both countries. However, Diagne *et al.* (2000) found that household and farmers would borrow more if additional credit were available at given interest rates even if it was higher than normal rates of interest. It is also in the interest of this study to find out the influence of interest rate on household participation and level of participation in micro-credit groups.

The impact of distance to the nearest financial institutions from the household dwelling palaces shows that households far away from financial institutions could have better community relationships and interpersonal trust, therefore social capital helps them have easy access to informal credit sources (Ineye and Oboh, 2011). Deviating from this (Nguyen, 2007; Barslund and Tarp, 2007) found that distance to nearest financial institution has no effect on credit programme participation. Further attesting to this Doan *et al.*, 2010 using logit model indicated that distance to the nearest banks has no significant influence on to loan sizes. This study sought to find out the influence of distance to the nearest financial institutions on household access and repayment performance in study area.

2.6 The Factors Influencing Group Loan Repayment Performance

Loan repayment performance has previously been investigated and reported in literature. Different econometric models have been applied to explain the effects of certain explanatory variables on repayment capacity of borrowers and results are also diverse. Some of these techniques are the ordinary least square (OLS) regression technique, the logit and probit analysis and the Tobit analysis. Depending on the choice of model, studies have attempted to measure the dependent variable, repayment rate, in different ways. First, the actual amount of unpaid loan in analysis of determinants of loan repayment among smallholder farmers in Ogbomoso agricultural zone of Oyo State, Nigeria (Oladeebo and Oladeebo, 2008). Secondly, the proportion or percentage of loan repaid at a given point in time using tobit model (Afolabi, 2010 and Oke *et al.,* 2007). Thirdly, dummy captured as 1, if

borrower repaid in full and 0, if otherwise, has been used as dependent variables for logit/probit analysis (Kohansal and Mansoori, 2009; Roslan and Karim, 2009; Oni *et al.,* 2005). This study adopted tobit model because the repayment rate (dependent variable) is continuous and is censored at a lower bound of zero (0) and an upper bound of hundred (100). In cases where dependent variable is continous, an OLS model will lead to biased and inconsistent estimates (Greene, 2011). Using a Probit or Logit would forego valuable information because the continuous dependent variable would need to be transformed into dummy variables.

The age of borrowers affects the loan repayment performance of the group as well as the individual. This variable was expected to influence the dependent variable positively. Vigano (1993) noted that with increase in age, it is usually expected that borrowers get more stability and experience in their business consequently they can generate high income leading to high repayment performance. Attesting to this Berhanu (2005) and Godquin (2004) found concurrent results arguing that elder borrowers may accumulate more wealth than youngsters and they feel responsibility for the loan. On the other hand, Fikirte (2011) noted in his study that age of the borrower was negative and significantly influenced loan repayment performance. This result is in line with the findings study done by Abafita (2003). The current endeavor therefore strives to establish the influence of the borrower's age on group loan repayment performance.

Many reasons have been given to explain the superiority of women over men relative to loan repayment. The prudence of women in their investment strategies has been cited as one of the reasons (Todd, 1996). Sensitivity of women to peer-pressure and interventions of loan managers has been put forward by Goetz and Gupta (1996) as one of the reasons for laudable women repayment records. Prospects of having access to credit as and when needed coupled with limited sources of credit have also been advanced as one of the motivators of appreciable repayment records of women (Armendáriz and Morduch, 2005). The basic argument behind lending to women is that they are good credit risks, are less likely to misuse the loan, and are more likely to share the benefits with others in their household, especially their children (Garikipati, 2008). Notwithstanding the above empirical results, there are studies that challenge the validity of superiority of women borrowers over their male counterparts in terms of loan repayment for instance Bhatt and Tang (2002) find no significant relationship. However, the study of Godquin (2004) in Bangladesh indicates that correlation between gender and repayment is positive but not significant. Due to such diverse

findings, this study sought to find out gender influence on group loan repayment performance.

Education level is expected to have a positive impact on repayment performance. A more educated borrower is expected to use the loan effectively as compared to a less educated one (Brehanu and Fufa, 2008). Education increases borrowers' ability to get, process and use the necessary information. In line with this, educated borrowers may develop the entrepreneurial skill and they may engage in new business with higher returns thereby ensuring good loan repayment performance. A study by Gebeyehu (2002) employing tobit model established that the level of education enhances loan repayment. Contrary, using a probit model Abafita (2003) ascertained that educational level is negatively related to loan repayment. This study uses years of education instead of the level of education while employing a tobit model to determine the influence of years of education on group loan repayment performance.

Household size is critical in determining loan repayment performance of the borrowers (Onyeagocha *et al.,* 2012). If there are many family members in the household then they need more income in order to cover the expense of their household members. Therefore, the borrower may use the loan directly for their daily consumption and other expense. In this case the default rate will be increased. Afolabi (2010) and Ojiako and Ogbukwa (2012) using logit and OLS regression respectively found that household size had a significant negative influence on loan repayment performance. However, Chirwa (1997) found no statistically significant effect of household size on loan repayment performance. The present study also sought to use the same variable in verifying its influence on group loan repayment performance.

Number of visits by loan officers is one of the important requirements for the success of microfinance institution (Assefa *et al.,* 2005). If the lender provides frequent number of visits, the group members will able to understand the rules and regulations easily. They also develop skill on how to do business and money utilization. This form of training is needed not only for borrowers but also for loan officers. In both cases it has a positive contribution to the repayment rate. Oke *et al.* (2007) using tobit model concur on the importance number of visits by loan officers such that increasing number of visits decreases of loan default rate. This study also uses this variable to determine its influence on loan repayment performance in Uasin Gishu County using the tobit model.

Von Pischke (1991) noted that efficient loan sizes fit borrowers' repayment capacity and stimulate enterprise. If the amount of loan released is enough for the purposes intended, it

will have a positive impact on the borrower's capacity to repay. On the other hand, in case of over and under finance, the expected sign is negative. If the amount of loan exceeds what the borrower needs and can handle, it will be more of a burden than help and extra funds may go toward personal use (Norell, 2001), thereby undermining repayment performance. In his study Abafita (2003) found that loan size is negatively related to loan repayment to him if the loan is too small it may encourage borrowers to divert the loan to other purposes which my lead to loan default. Loan size variable is also incorporated in the current study to determine the effect it has on group loan repayment performance.

Increasing group size, reflected by the number of group members, is expected to augment the repayment rate (Zeller, 1996). With increasing group size, economies in scope, scale, and risk management can be realized by the group. Given a limited time and budget and the need to achieve certain management targets, such as a high repayment rate, the loan officers may also tend to visit larger groups more frequently, as unit costs per member serviced tend to be lower. Furthermore, larger groups have more opportunities to exploit scale effects through joint procurement of inputs and marketing of outputs, thus increasing their negotiation power to obtain more favorable prices. On the other hand, Lawal *et al.* (2009) demonstrated that large groupsize beyond a manageable level will disproportionately increase the internal management and monitoring costs, and jeopardize social cohesion of the group, which then creates a moral hazard and free-rider problems creating high loan default rates. Group size variable measured by the number of members in a given micro-credit group was incorporated in this study to establish its influence on group loan repayment performance.

The literature reviewed in this study revealed consensus results among some variables which were analyzed in different studies. However, there is controversy with respect to some variables which could be attributed to the use of different models in analysis. The review also identified that limited studies have been conducted on the effect of social capital dimensions group performance. This study seeks to employ the Heckman two step procedure to determine the factors influencing household participation and level of participation in micro-credit groups and a Tobit model to determine social capital dimensions and other factors that influence group loan repayment performance.

2.6 Theoretical Framework

The decision to either participate in micro-credit groups or not in this study is built on utility theory which depends on whether group borrowing scheme gives the household higher

utility than the individual borrowing scheme. Participation/adoption studies involve two stages: The decision to either participate/adopt or not and in the second stage, the level of participation/adoption (Mercer and Pattanayak, 2003). The decision to either participate in micro-credit groups or not is dichotomous and therefore a binary choice model has been identified as appropriate for such estimation. However, this is only possible under the following assumptions: that the households are faced with only two alternative choices and that any choice an individual chooses depends on their characteristics (Pindyck and Rubinfeld, 1997).

The expected net utility derived from participation in micro-credit groups or not given household's characteristics is determined as follows:

$$EU_iP = f(W_i) + e_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

$$EU_iN = f(X_i) + e_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where, EU_iP is the expected net utility of household i from participating in group borrowing while EU_iN is the expected net utility of household i from individual borrowing, P denotes group borrowing while N denotes individual borrowing. X_i and W_i are independent variables denoting social capital dimensions, institutional and household characteristics and e_i is an error term. The expected net utility from each of the decisions will then be compared. To compare, Y_i will be used as an indicator of whether household i participates in micro-credit group or not, so that $Y_i=1$ if it participates and $Y_i=0$ if not, as indicated in equation (3) below.

$$\begin{cases} Y_i = 1 \; if \, EU_iP - EU_iN > 0 \\ Y_i = 0 \; if \, EU_iP - EU_iN < 0 \end{cases} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

Equation (3) implies that the probability that the household i participates in group borrowing is given by the probability that the expected net utility derived from group borrowing is greater than the expected net utility derived from individual borrowing. While the probability that the household i borrows individually is given by the probability that the expected net utility derived from group borrowing is less than the net utility derived from individual borrowing.

2.7 Conceptual Framework

When faced with limited credit access rural households make decisions with a motive of increasing their credit access as well as improving repayment performance. However, what is observed is type of borrowing decision. To model the household access to credit the first step is to analyze rural household type of borrowing. Assuming that a household has two alternative types of borrowing i.e group and individual borrowing, then their decision will

depend on the relative advantage of each of type of borrowing and its contribution to repayment performance. Any borrowing type with more expected access to credit has a higher likelihood that it will be chosen. As shown figure 1 various factors inter-relate to influence household access to credit and repayment performance.

This study is built on the premise that joining and actively participating in a micro-credit group results in improved credit access and repayment performance. Therefore households who join and actively participate in micro-credit group are expected to benefit from access to credit without collaterals and improved repayment performance. The decisions to either join a micro-credit group or not are assumed to be determined by household demographic factors, farm attributes and institutional factors. The next stage in group borrowing category is the level of participation in the micro-credit groups measured by the number of loans borrowed by each individual group member. This is influenced by an additional set of variables social capital dimensions. On the other hand, those who have tangible collaterals opt for individual borrowing category.

The dependent variables in this study were participation/joining a micro-credit group and the level of participation in the micro-credit group. To model such decision making process Tobit, Heckman two step procedures and double hurdle models could be used however, faced with such situations, the assumption of simultaneous and sequential decisions are usually considered. A Tobit model assumes that household makes the decision simultaneously (Sindi, 2008). The Heckman two step procedure and double hurdle models use two stage procedures where first stage models the household's choice to join micro-credit group and second stage models the level of participation.

In this study the decision to join a micro-credit group and the level of participation may not necessarily be jointly determined. Consequently, the decision to join a micro-credit group could precede the level of participation depending on the prevailing factors. In such a scenario there is high likelihood that household will only increase their number of borrowings if there is a strong cohesion within micro-credit group enhanced by social capital dimensions. In this study the factors that determine decision to join a micro-credit group and the decision on level of participation are different given the existence of social capital dimensions which only determine the household number of borrowings. Additionally, since observed number of borrowings is nonrandom and conditional on the decision to join a micro-credit group then sample selection problem is introduced. To correct this Heckman two step procedure is a suitable model and consequently is adopted for this study. Double hurdle model unsuitable as

it assumes that the same factors that determine participation also determine level of participation.

To determine the factors influencing micro-credit group loan repayment performance, logit, probit and Tobit analysis have been used (Oke *et al*., 2007; Afolabi, 2010 and Roslan and Karim, 2009). The dependent variable in this case is the repayment rate computed as a percentage of total loan repaid to the total loan borrowed. Since dependent variable ranges between 0 and 100 an appropriate model is Tobit. The other models assume that the dependent variable is dummy whereby complete loan repayment takes the value 1 and 0 otherwise. Under such assumption we lose important information about those who have partly repaid as they are assumed to be loan defaulters. Given this weakness this study adopted a Tobit model to determine social capital dimensions and other factors influencing household loan repayment performance.
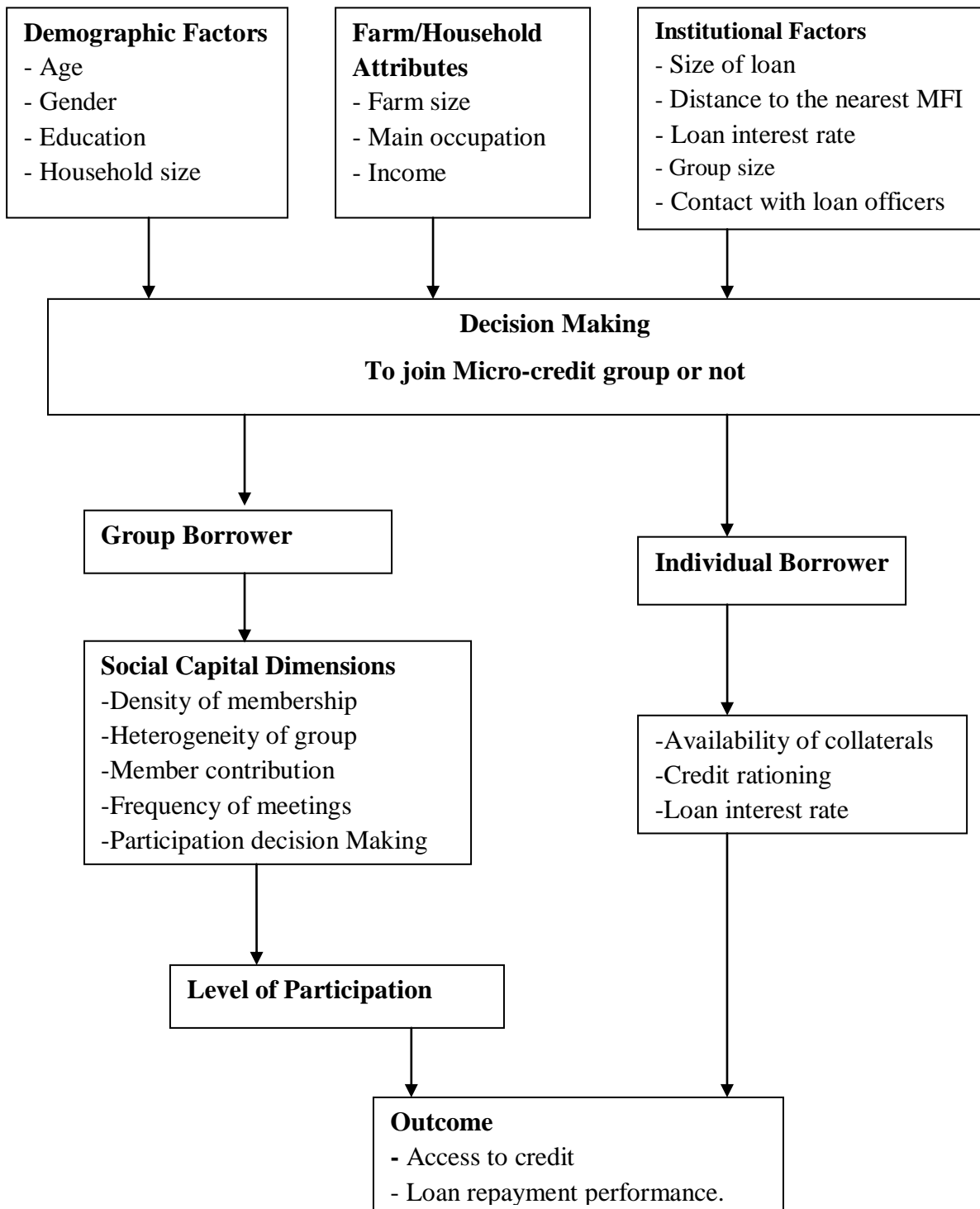
Figure 1: Conceptual Framework Showing the Factors Influencing Micro-Credit Group Participation and Loan Repayment Performance

Source: Author's Conceptualization.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Area

The study was carried out in Moiben Division, Uasin Gishu County. The County is one of the 47 counties of Kenya. It extends between longitude 34° 50′ and 35° 37′ East and 0° 03′ and 0° 55′ North with a total area of 3327.8 km^2. It borders six counties namely Elgeyo Marakwet to the East, Trans Nzoia to the North, Kericho to the South, Baringo to the South East, Nandi to the South West and Bungoma to the West. Eldoret is its headquarters as well as its commercial centre. Moiben division consists of 6 locations and has a total area of 778 km^2 with a population of 92,717 (DAO, 2001). Figure 1 shows the map of Uasin Gishu District presently Uasin Gishu County. The main economic activities in the county include both large and small scale maize and wheat farming, passion fruit growing, dairy farming, sports (Athletics), Manufacturing and agro processing. Financial services in the county include nineteen (19) Commercial banks and eleven (11) Micro-FinanceInstitutions.

3.2 Sample and Sampling Method

Multi-stage sampling method was used to obtain appropriate sample size. First, Uasin-Gishu County was purposively selected. Within Uasin-Gishu County, Moiben division was purposively selected because it had high concentration of micro-credit groups in the County. Second, the borrowers in the division were stratified into two groups: those who borrowed through groups (group borrowers) and those who borrowed individually. In the group borrowing category purposive sampling of micro-credit groups which have been operating for the past two years since their formation was done using list of micro-credit groups obtained from Faulu Kenya, Kenya Women Finance Trust (KWFT), Kenya Agency for the Development of Enterprise and Technology (KADET) and Small and Micro Enterprise Programme (SMEP). A total 29 micro-credit groups were found to have been operating for the last two years, within these groups, 4 respondents were selected randomly to give a sample 116. Simple random sampling was employed to select 58 individual borrowers to act as a control group. This gave a total of 174 respondents for the study. Primary data was collected using a structured questionnaire. Data on socio-economic factors, institutional factors and social capital dimensions was collected.
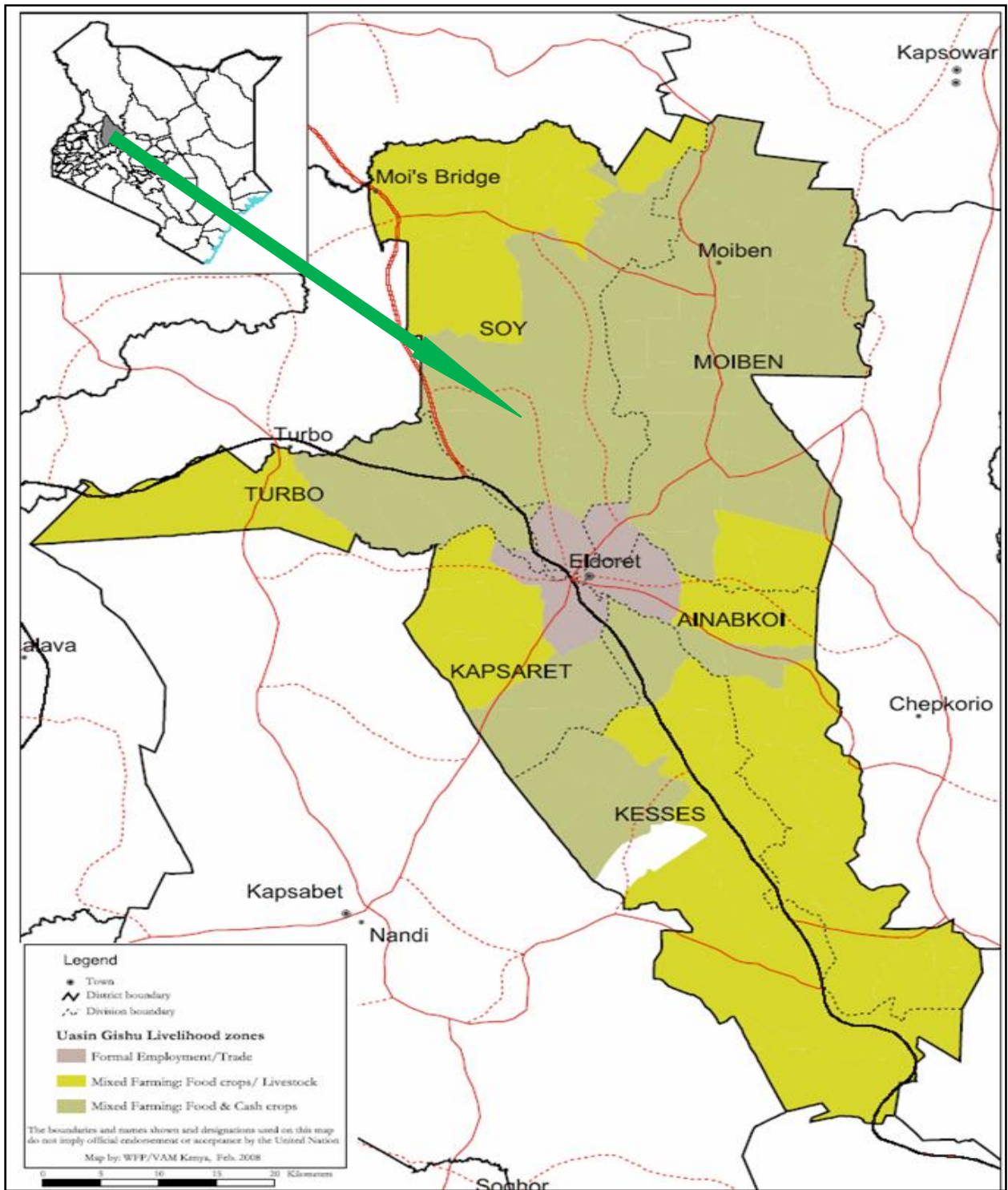
Figure 2: Uasin Gishu County Map.

Source: Adopted from Baraza *et al*. (2008)

3.3 Sampling Method

The required sample size was determined using proportionate to size sampling method by Anderson *et al*. (2007).

$$n = \frac{pqZ^2}{E^2}$$ .... (4)

Where n = sample size, p = proportion of the population containing the major interest, q= 1-p, z= confidence level (α = 0.05), E = acceptable/allowable error. Since the proportion of the population is not known, p=0.5, q = 1-0.5= 0.5, Z = 1.96 and E = 0.075. This resulted to a sample size of 174 respondents.

3.4 Data Analysis

SPSS computer program was used to determine borrowers socio-economic characteristics. STATA program was used to estimate Heckman two-step procedure to determine factors influencing micro-credit group participation and level of participation. Tobit model was used to determine the household loan repayment performance.

3.5 Social Capital Dimensions

The social capital dimensions used in the analysis include: density of membership, heterogeneity index, meeting attendance index, cash contribution and decision making index. The measurement of each is as described below as used by (Lawaal *et al.,* 2009; Okunmadewa *et al.,* 2007; Yusuf, 2008).

Density of membership: This was captured by the summation of the total number of groups to which the household belongs, that is the group membership by individuals is summed up. The households where asked to indicate the micro-credit group which they have active membership.

Heterogeneity index: This is an aggregation of the responses of each household to the questions on the diversity of members of their micro-credit group. Within their group each household answered questions on whether members are of same age group, same gender, same education level, same occupation and same economic status. Hence, for each of the factors a Yes response is coded 0 while No response is coded 1. A maximum score of 5 represents the highest level of heterogeneity and a minimum of 0 represent the highest level of homogeneity. These scores were then divided by the maximum score of 5 to obtain an index which is then multiplied by hundred. A zero value represents complete homogeneity while 100 represent complete heterogeneity (Yusuf, 2008).

Meeting attendance index: This is obtained by summing up the attendance of household members to meetings and dividing it by the number of scheduled meetings per month in the micro-credit group they belong to get an index. This value was multiplied by 100.

Cash contribution: This was obtained by the summation of the total cash contributed to the group which the household belong.

Decision making Index: This is calculated by summation of the subjective responses of households on their rating in the participation in the decision making. The responses were averaged across the three groups and multiplied by 100 for each household.The questionnaire asked group members to evaluate subjectively whether they were "very active" "active" "passive" "very passive" or not participating in the group's decision making. This response was scaled from 4 to 0, respectively. Each response value was divided by a maximum of 4 to get an index and multiplied by 100 for each household (Okunmadewa *et al.,* 2007).

3.6 Empirical Models

Descriptive analysis and two empirical models (Heckman two-step procedure and Tobit model) were used to estimate the desired variables. Descriptive analysis in objective one was used to characterize the socio-economic attributes of the respondents. In the second objective, Heckman two-step procedure was used to determine factors influencing participation in micro-credit groups and the level of participation. Tobit model was used in the last objective to determine the factors influencing group repayment performance.

3.6.1 Heckman Two-step Procedure

The Heckman two-step model was used to extract determinants of household participation in micro credit groups. It involves estimation of two equations: Selection equation in the first step and outcome equation in the second step (Heckman, 1979). First is whether a household participates in micro-credit groups or not then second is the level of participation (number of loans). The number of loans borrowed by individual through the micro-credit group is conditional on the decision to participate in the group. Previous studies show that, estimation of such relationships is normally problematic due to sample selection bias.

The two-steps include; first a Probit model for participation or selection equation is estimated. This step estimates the probability of group participation as shown in the equation (5) below.

$$P_i = \delta Z_i + \varepsilon_i, \quad E\left(\varepsilon_i / Z\right) = 0 \text{ .... (5)}$$

Where, P_i is a dummy for participation in micro-credit group while Z_i is a vector of variables that affect participation decision. The next equation explains the level participation.

$$Y_i = \beta X_i + \mu_i, \; E\left(\mu_i / X\right) = 0 \quad \text{.. (6)}$$

Where; Y_i indicates the level of participation measured in terms of number of loans by a borrower, X_i is a vector of variables that explain the levels of participation, ε_i and μ_i are the error terms. The model assumes that Z and X are observable exogenous variables and X is a subset of Z. If the correlation between ε_i and μ_i is not zero it brings about the selection bias problem. After estimating the selection equation a non selection bias is computed using equation (7) below.

$$E\left(\varepsilon_i / P_i, Z_i\right) \quad \text{... (7)}$$

Which is called Inverse Mills Ratio (IMR) $\lambda(\delta Z_i)$ when $P_i=1$ (Wooldridge, 2002). Then the new lambda is used in the selection equation (6) as an explanatory variable. The new equation for the second stage regression is therefore:

$$E(Y_i = Z_i, P_i = 1) = \beta X_i + \rho\lambda(\delta Z_i) \quad \text{... (8)}$$

Equation (8) gives the expected number of loans Y_i given vectors of observable factors Z_i and given that the household has already made the decision to participate in micro-credit group. This can be explained by vector of observable characteristics X_i and the Inverse Mills Ratio evaluated as, $\lambda(\delta Z_i)$.

If $P_i=0$ then there is no evidence of the selection bias and the regression reverts to OLS. But if $P_i \neq 0$ then there were omitted variables in the initial model correlated with X_i which is corrected by including IMR in the second regression.

The two steps are specified as follows

Step 1. Selection equation (Probit).

BLNGTOGRP=β_0+β_1AGE+β_2GENDER+β_3EDUC+β_4HHSIZE+β_5FMSIZE+β_6YRSDVSN+ β_7AWARENESS+β_8INTRSTRATE+β_9LANDTNR+β_{10}DSTNC+β_{11}LnFRMINCM+ β_{12}MAINOCCP+ε...(9)

Step 2. Outcome equation (Linear regression)

NUBORRWNGS=β_0+β_1AGE+β_2GENDER+β_3EDUC+β_4HHSIZE+β_5FMSIZE+β_6MAINOC CP+β_7GRPSIZE+β_8MTNGATNDCINDX+β_9HETEROINDX+β_{10}LnCSHCNTBN+β_{11}DECS NINDX+β_{12}DSTYMBSHP+β_{13}INTRSTRATE+β_{14}EXPERNCE+ε................................... (10)

Table 1: Description of Variables used in Heckman Two-step Procedure

Variable Code	Description	Measurement	Sign
BLNGTOGRP	Membership in microcredit group	1=group,0=Individual(Dummy)	
AGE	Age of borrower	Years (continuous)	+
GENDER	Sex of the borrower	1=Male,0=Female (Dummy)	+/-
EDUC	Years of fromal education	Years (continuous)	-
HHSIZE	Number of household members	Number of members	+
FMSIZE	Total household farm size	Hectares (Continuous)	+/-
MAINOCCP	Household main occupation	1= Farming, 0= Otherwise	+
LANDTNR	Land tenure system	1=with title, 0=Otherwise	+/-
AWARENESS	Awareness of group borrowing	1=Yes 0= No (Dummy)	+
INTRSTRATE	Loan interest rate	Percentage (Continous)	-
GRPSIZE	Number of members in the micro-credit group	Number of members (continuous)	-
MTNGATNDCINDX	Index derived from the number of meeting per month	Generated index (continuous)	+
HETEROINDX	Index derived from age, education level, level of wealth and gender variables	Generated index (continuous)	+/-
LnCSHCNTBN	Amount contributed per month	Kenya shillings (continuous)	+/-
DECSNINDX	Index derived from level of participation in group decision making	Ranging from *Very active* to *not participating* (Categorical)	+/-
DSTYMBSHP	Number of groups one is a member	Number (continuous)	+

3.6.2 Tobit Model

To evaluate the repayment performance of the micro-credit groups, the variable loan repayment rate (REPYMTRATE) was used as a dependent variable in the Tobit model which meant the amount of current loan already repaid as at the end of July 2012. The loan repayment rate (REPYMTRATE) was computed as a percentage of total loan amount repaid to the total loan borrowed. The variable was zero in the case of non repayment on the schedule time and was equal to 100 in the case of complete repayment. Tobit regression model which is based on maximum likelihood technique (Maddala, 1983; Gujarati, 2004) was used. The structural equation of the Tobit model is given as:

$$Y_i^* = X_i\beta + \varepsilon_i \text{ ....(11)}$$

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Where Y_i^* is a latent variable for the ith group borrower that is observed for values greater than τ and censored for values less than or equal to τ. The Tobit model can be generalized to take account of censoring both from below and from above. X is a vector of independent variables postulated to influence repayment rate. The β's are parameters associated with the independent variables to be estimated. The ε is the independently distributed error term assumed to be normally distributed with a mean of zero and a constant variance. Of course, we could collapse all positive observations on Y_i and treat this as a binomial probit or logit estimation problem, but doing so would discard the information on the amount repaid by the borrower as at a certain time. Hence observed Y is defined by the following generic equation:

$$\begin{cases} Y_i = Y^* \, if \, Y^* > \tau \\ Y_i = Y^* \, if \, Y^* \leq \tau \end{cases} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(12)$$

Typically, the Tobit model assumes that $\tau = 0$ which means that the data is censored at zero. However, repayment rate of borrowers range between 0-100, Thus substituting τ in equation 12 above yields.

$$\begin{cases} Y_i = Y^* \, if \, 0 < Y^* < 100 \\ \quad Y_i = 0 \, if \, Y^* \leq 0 \\ \quad Y_i = 100 \, if \, Y^* \geq 100 \end{cases} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(13)$$

The model assumes that there is an underlying repayment rate equal to $(X_i\beta + \varepsilon_i)$ which is observed only when it is repayment rate between 0 and 100; otherwise qualifies as an unobserved latent variable. The dependent variable is not normally distributed since its values range between 0 and 100.

The empirical Tobit model for this study therefore takes the following form:

$$Y_i^* = \beta_0 + \sum_{n=1}^{n} \beta_n X_i + \varepsilon_i.$$

$Y_i^* = \beta_0 + \beta_i X_1 + \beta_1 X_2 + \beta_2 X_3 + \beta_3 X_4 + \dots \beta_n X_n + \varepsilon$ ....(14)

REPYMTRATE$(Y_i^*)=\beta_0+\beta_1$AGE$+\beta_2$GENDER$+\beta_3$EDUC$+\beta_4$HHSIZE$+_5$FMSIZE$+$ β_6LnTTLINCM$+\beta_7$LANDTNR$+\beta_8$DSTNC$+\beta_9$GRPSIZE$+\beta_{10}$LnLNSIZE$+\beta_{11}$VISITS$+\beta_{12}$EXPERNCE$+\beta_{13}$PEERPRSRE$+\beta_{14}$MTNGATNDCINDX$+\beta_{15}$HETEROINDX$+\beta_{16}$LnCSHCNTBN $+\beta_{17}$DECSNMKNGINDX$+\beta_{18}$DSTYMBSHP$+\varepsilon$...(15)

It is worth nothing that estimating the model using OLS would produce both inconsistent and biased estimates (Gujarati, 2004). This is because OLS underestimates the true effect of the parameters by reducing the slope (Goetz, 1995). Therefore, the maximum likelihood estimation is recommended for Tobit analysis.

Table 2: Description of Variables used in the Tobit Model

Variable Code	Description	Measurement	Sign
REPYMTRATE	Amount repaid divided by total amount borrowed multiplied by 100	Percentage (continous)	+/-
AGE	Number of years of borrower	Years (continuous)	+/-
GENDER	Sex of the borrower	1=Male, 0=Female (Dummy)	+/-
EDUC	Years of formal education	Years (continuous)	+
HHSIZE	Number of household members	Number of members (continuous)	+
LnTTLINCM	Total household income	Kenya Shillings (continuous)	
FMSIZE	Total household farm size	Hectares (Continuous)	+
LANDTNR	Land tenure system	1=with title, 0=Otherwise	+
DSTNC	Distance from borrower dwelling place to the MFI	Kilometers (continous)	-
GRPSIZE	Number of members in the micro-credit group	Number of members (continuous)	-
LnLNSIZE	Amount of loan borrowed	Kenya Shillings (continuous)	-
INTRSTRATE	Loan interest rate	Percentage (continuous)	-
EXPERNCE	Number of years participating group borrowing	Years (Continous)	+
VISITS	Number of visits by loan officer to the micro-credit	Number of visits (Continous)	+
PEERPRSRE	Level of peer pressure within the group.	Ranging from *No pressure* to *Extremely strong pressure*	+
MTNGATNDCINDX	Generated index	Index (continuous)	+
HETEROINDX	Generated index	Generated index (continuous)	+/-
LnCSHCNTBN	Contribution per month	Kenya shillings (continuous)	+/-
DECSNINDX	Level of decision making	Categorical	+/-
DSTYMBSHP	Number of groups one is a member	Number of groups (continuous)	+/-

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the results and discussions. First, the background information of respondents is presented; these are compared between individual borrowers and group borrowers and tested statistically using the t-test and chi square to determine whether there are any significant differences between them. Second, the factors influencing participation and level of participation in micro-credit groups are presented and lastly, the factors that influence the repayment performance in the micro-credit groups.

4.1 Descriptive Results

4.1.1 Socio-economic Characteristics of Group and Individual Borrowers

Table 3 shows the results of the test of significance for the continuous household socioeconomic variables disaggregated by type of borrowing. The mean age of the entire sample was 41.24 years, with the mean age for individual and group borrowers being 44.69 and 39.52 years respectively. These results clearly show that individual borrowers were relatively older than group borrowers. This is further affirmed by the t-test which is significant at 1percent level revealing that individual borrowers had a significantly higher mean age than their counterpart group borrowers. The reason could be because older persons are already established while the younger borrowers are in the process of getting established hence join micro-credit groups inorder to initiated projects likely to yield rapid results to meet their ambitions. This is consistent with Davis *et al.* (2010) results who found out that younger farmers were more likely to participate in farmer field school groups than the older farmers in Uganda, Tanzania and Kenya.

The results on household size showed that the mean household size was 6 persons for the total sample. Similarly, individual borrower's category and the group borrower's category also had 6 persons. This shows that there is no difference in the household size for the two borrowing categories. The t-test also indicates that that there is no significant difference between group and individual borrowers in terms of household size.

Table 3: Household Characteristics by Type of Borrower in Uasin Gishu County, Kenya (Continuous variables)

Variable	Individual=58 Mean	Std.dev	Group=116 Mean	Std.dev	Pooled=174 Mean	Std.dev	T-test
Age (Years)	44.69	7.54	39.52	4.89	41.24	6.37	5.451***
Household size (Number)	5.64	1.92	5.59	2.00	5.61	1.97	0.136
Farm size (Ha)	4.29	2.48	2.46	1.11	3.07	1.89	6.730***
Education (Years)	12.42	2.89	10.17	3.19	11.02	3.31	5.126***
Years in the Division	19.37	10.90	20.14	9.89	20.08	10.21	-0.105
Farm income (KES.)	149482.80	116614.80	55301.72	51954.36	86695.40	84284.60	5.697***
Off-farm income (KES.)	280862.10	214093.60	80689.66	76742.74	147413.80	145418.17	8.753***
Total income (KES.)	430344.80	233057.20	135991.40	104678.00	234109.20	211057.60	11.501***
Loan size (KES.)	229137.90	118488.80	61250.00	28059.53	117212.60	106999.90	14.507***
Distance to financial inst. (KM)	12.82	7.58	20.44	8.69	17.90	9.06	-5.682***
Interest rate (percent)	19.89	2.90	22.19	3.32	20.66	3.36	4.487**

*, **, *** is significant at 10 percent, 5 percent and 1 percent respectively

Farm size characteristic results shows that the mean size of land for the total sample in hectares is 3.07 while that of individual and group borrowers was 4.29 and 2.46 hectares respectively. The t-test indicates that there is a significant difference between individual and group borrowers with regard to farm size at 1 percent level. Since individual borrowers had a larger farm size as compared to the group borrowers this could be the reason why they access credit individually as their land can act as collateral required to access individual credit. Correspondingly, the smaller pieces of land by group borrowers could constrain them from acquiring individual loans, making them join borrowing groups to access credit.

It was necessary to analyze the years of education of the borrowers since literacy is supportive to obtaining credit. The years of education of the applicants positively influence the granting of credit by the lending institutions. This is because the literate are expected to keep records of their enterprises which is a good basis for assessing of viability Ayamaga *et al.* (2011). Majority of the borrowers (97.70 percent) had acquired formal education. Individual borrowers had higher mean years of schooling of 12 compared to group borrowers who had a mean of 10 years. These results give a positive indication that rural areas are no longer a place for the illiterate therefore well designed credit policies would generate a transformation in such areas. The statistical t-test was significant at 1 percent level, confirming that indeed individual borrowers were more educated than the group borrowers.

Among all the borrowers, majority had been living in Moiben Division for at least 20 years. The mean years of residence in the Division for the individual borrowers was also 19 years while the mean for group borrowers was 20 years. This shows that there is no significant difference between individual borrowers and group borrowers on the number of years of residence the Division. The t-test shows no significance difference.

The results of household incomes indicate that the mean annual farm income for all the sampled households was KES. 86696.40. It is shown that individual borrowers had a higher mean annual farm income of KES. 149482.80 compared to KES. 55301.72 obtained by their group borrowers' counterpart. The t-test confirmed this and was strongly significant at 1percent level. The farm income comprised of average annual income from all farming activities undertaken by the household.

The entire mean annual off-farm income was KES. 147413.20. Individual borrowers had a higher annual off-farm income of KES. 280862.10 compared to KES. 80689.66 earned by group borrowers. The statistical significance t-test revealed that the two categories of borrowers were different with regard to off-farm income at 1 percent level. Off-farm income comprised of average annual income from employment, business, and any other income apart

from farm income. This finding presents evidence that off-farm income is vital in influencing participation in farmer groups, and is consistent with (Mathenge and Tschirley, 2007) that off-farm earning is useful in spreading the risk associated with using modern farm technologies in that it provides ready cash for smoothening household consumption.

The mean distance to the nearest financial institution was 17.90 Km for the entire sample. Disaggregating into individual and group borrowers, the results showed that individual borrowers travelled for a mean 12.82 Km to the nearest financial institution while group borrowers traveled further indicated by 20.44 Km. The t-test was significant at 1 percent level indicating that the mean distance to the financial institution for group borrowers was significantly greater than that of individual borrowers. This implies that in accessing credit, group borrowers were disadvantaged than the individual borrowers in terms of distance. This could explain why the longer the distance to the financial institution the higher the chance of joining micro-credit group. This is because of the high cost of travelling in search for credit. As reviewed by (Okten and Osili, 2004) distance to the nearest financial institution in the community was found plausible and had a negative and significant effect on the probability of being granted credit. Arguing that the costs of screening and monitoring borrowers may rise with distance from the financial institutions.

Another important factor considered is the size of loan borrowed by the household. The mean amount borrowed for the entire households was KES. 117121.60. The amount borrowed by the individual borrowers was KES. 229137.90 whereas the mean of group borrowers was KES. 61250.00. The t-test for difference in mean loan borrowed was significant at 1percent level implying that group borrowers obtained a significantly lower loan during the study time than their group borrower's counterparts. This reflects the limited capacity of group borrowing approach arising from social capital and financial institution characteristics.

The interest rate charged for the loan borrowed is an important factor in determining the size of loan, number of borrowings and mode of borrowing. The mean annual interest rate charged for the whole sample was 20.66 percent. Individual borrowers were charged mean annual interest rate of 19.89 percent which is lower than the mean charged for the group borrowers of 22.19 percent. The t-test confirmed that there was a significant difference between group and individual borrowers with regard to the interest rate at 1percent level. This could explain why poorer households joined micro-credit groups. In their study Balogun and Yusuf (2011) found that irrespective of the higher level of interest rate in the group lending program, households would still pursue credit through this channel because of their

dire need and and lack of tangible collaterals to access formal credit. The result was a deviant from natural demand that says increase interest rate leads to decrease in quantity of credit demanded (Mpuga, 2008).

The results on household dummy variables gender and land tenure system are presented in table 4. In the individual borrowers category 70.69 percent were male and 29.31 percent were female. In the group borrowing category the percentage of female was relatively higher with 63.79 percent compared to the male who were 36.21 percent. In fact, the chi-square test was strongly significant at 1 percent level, indicating that there were significantly more female borrowers in the group borrowing category than in the individual borrowing category. This difference can be attributed to the fact that in Moiben Division as, is in most Kenyan communities, the male posses land ownership rights and other capital resources which are used as collateral to acquire loans from formal financial institutions. Hence, the male are likely to borrow loans as individuals. Women on the other hand engage in microcredit loans obtainable through groups (*Chamas*). Joining these groups in many occasions is involuntary but it is a condition given by lenders.

Table 4: Household Characteristics by Type of Borrower in Uasin Gishu County, Kenya (Dummy variables)

Variables		Individual=58		Group=116		
		Frequency	Percent	Frequency	Percent	Chi2
Gender	Male	41	70.69	42	36.21	
	Female	17	29.31	74	63.79	18.43***
Land Tenure	With title deed	46	79.31	74	62.07	
	Without	12	20.69	42	37.93	4.35**

*, **, *** is significant at 10 percent, 5 percent and 1 percent respectively

The land tenure system in the Division is comprised of both titled and untitled ownership. Results in table 4 point out that 79.31 percent of the individual borrowersowned land with title deeds while 20.69 percent were without title deeds. In the group borrowers, 62.07 percent had title deeds while 37.93 percent did not. In most cases, title deeds are used as collaterals for credit. Slightly higher percentage (37.93 percent) of group borrowers did not have title deeds as compared to 20.69 percent of individual borrowers. This may be explained that lack of the right to land ownership played a crucial role in joining of micro-credit groups. Studies have supported these conclusions for instance there was evidence in Gambia that increased individual rights lead to greater credit access and investment, resulting in higher

productivity (Hayes *et al.,* 1997). Chi-square tests also revealed that there was a significant difference at 5 percent level, with respect to the land tenure system among the two loan borrowing categories.

4.1.2 Social Capital Dimensions

The summary statistics for five dimensions of social capital dimensions are presented in table 5. The results indicate that on average group members attended group scheduled meetings per month with a 72.70 percent index of meeting attendance. According to Karlan, 2006 several activities occur during the scheduled meetings, including loan payments, group cash contribution, issuing new loans, training in group operations and the importance of group solidarity, and monitoring of loan repayment by all members. The micro-credit groups were heterogeneous in terms of age, gender, education level, occupation and economic status with a 60.17 percent index of heterogeneity. Social heterogeneity appears to facilitate a confidence that other members will indeed repay for the unintended defaulting members, augmenting the belief that the group is likely to receive subsequent loans in the future and that those who intentionally do not repay in will not get the next round of borrowing Cassar *et al*. (2007). In terms of their monthly contribution all the groups contributed some amount of money to the group which is saved and used to run group activities as required by the microfinance institution. This amount can later be used in case of group inability to repay the borrowed loan. The least amount that a group contributed monthly was KES. 400 while the maximum was KES. 2500. On average each member contributed KES. 1282.80 monthly to the group.

Table 5: Summary Statistics of Social Capital Dimensions in Uasin Gishu County, Kenya

Social Capital Dimensions	N	Min	Max	Mean	Standard deviation
Meeting attendance Index	116	0	100	72.70	29.11
Heterogeneity index	116	0	100	60.17	27.47
Monthly Cash contribution	116	400	2500	1282.80	408.45
Decision making index	116	0	100	75.22	26.47
Density of membership	116	1	3	1.88	0.72

Decision making index indicate member participation in decision making is an average of 75.22 percent index. Lastly, in the density of membership variable, results showed that household have membership in at least one (1) micro-credit group and a maximum of

three (3) groups. On average households have membership in two (2) micro-credit groups. It is widely recognized that efficient and equitable groups are those that allow participation of members in the decision making processes, as well as the sharing of benefits and costs Tabi (2009). Incorporating members in group decision making, different segments of the society feel the need to pool resources within groups which has more capability to voice their needs.

4.2 Results of Heckman Two-step Procedure

Heckman two-step procedure was applied to analyze the socioeconomic, social capital dimensions and institutional factors that determine participation and the level of participation in the group borrowing program. The procedure was chosen for estimation to correct the sample selection bias as proposed by Heckman (1979). The following variables were included in the estimation age, gender, household size, years of education, land tenure system, awareness to the group borrowing programme, years living in the Division, distance to the nearest financial institution, loan interest rate and social capital variables. Post estimation of the selection equation results was done to determine marginal effects of variables for use in interpretation. The reason is that coefficients have no direct interpretation because they are just values that maximize the likelihood function. On the other hand, marginal effects have direct interpretation and hence facilitate discussion of the results.

4.2.1 Factors Influencing Households to Join Micro-credit Groups

Both household and loan characteristics significantly influenced the decision to join micro-credit group as shown in table 6. These are age, gender, household size, years of formal education, farm land size, farm income, loan interest rate and distance to the nearest financial institution. The negative signs of marginal effects reduce probability of household participating in group borrowing loan scheme while the positive signs increase the probability of participating in the loaning schemes. The coefficient of IMR was also significant and positive 0.048.

Several studies have found the influence of age on micro-credit group participation to be either positive or negative. This study found out that age (AGE) significantly and negatively influenced household participation in micro-credit group borrowing with marginal effect of 0.031. This indicates that an increase in age of the borrower by one year reduced the probability of joining micro-credit group by 3.1 percent. This means that other things remaining constant as the household age increases they accumulate collateral that enable them seek for individual loan. Coupled with this is that the chances of older people being

considered for credit are low, and are due to the low probability of success, with the high risk of default. This is consistent with the results from Nguyen (2007) who found out that older households often have more assets, reputation and meet the requirement for getting formal credit in contrast with younger household who often lack capital and other conditions forcing them to join micro-credit groups to access informal credit. Ayamaga *et al*. (2006) also found that as age increases, the probability of a farmer to participate in microcredit programmes in Northern Ghana, decreased.

Table 6: Heckman selection equation results on the determinants of participation in micro-credit Groups in Uasin Gishu County, Kenya

Variable	Marginal effect	Z	P>|z|	X
AGE	-0.031	-2.61	0.009***	41.241
GENDER (*)	-0.281	-2.63	0.009***	0.477
HHSIZE	0.077	2.37	0.018**	5.609
EDUC	-0.087	-3.74	0.000***	11.023
LANDTNR (*)	-0.142	-1.54	0.125	0.689
FMSIZE	-0.229	-3.31	0.001***	3.066
MAINOCCP	0.033	0.29	0.774	0.540
LnFRMINCM	0.033	2.29	0.022**	9.245
AWARENESS	0.114	1.09	0.275	0.644
YRSDVSN	0.000	0.04	0.968	20.081
INTRSTRATE	-0.051	-3.65	0.000***	20.655
DSTNC	0.018	2.99	0.003***	17.901
_cons	12.110	4.40	0.000	
Mills lambda	0.538	-1.98	0.048**	
Rho	-0.703			
Sigma	0.765			
Number of obs	174	Wald chi^2 (20)	151.550	
Censored obs	58	Prob>chi^2	0.000	
Uncensored obs	116	Pseudo R^2	0.652	

(*) is for discrete change of dummy variable from 0 to 1

*, **, *** is significant at 10 percent, 5 percent and 1 percent respectively

The literature on effect of gender on joining micro-credit groups is ambiguous. This study revealed gender of the borrower (GENDER) was significant and negatively influenced

household to join micro-credit group with a marginal effect of 0.281. This implies that the probability of females joining micro-credit group is 28.1 percent higher than men. The interpretation is that since female household do not have/own the collaterals required to borrow from formal financial institutions such as title deeds, they are forced to join borrowing groups It could also be due to the structure of finacial instutions, for instance (Tran, 1997) showed that there are some informal financial institutions which provide credit to women only. Elsewhere (Oladele and Olawuyi, 2012) revealed that gender was important in micro-credit group participation in Nigeria though negative which negates aprior expectation. This was connected to the predominant female groups in the area. Owour, (2009), results on gender indicate immense involvement of women in rural economy as well as the fact that women get more attracted to MFI credit that peg no tangible asset to lending, reason being that a majority of women in Africa still lack right to property to hold as collateral against credit.

Household size (HHSIZE) significantly and positively influenced household decision to join micro-credit group with marginal effect of 0.077. This implies that a unit increase in household size increases probability of joining micro-credit group by 7.7 percent. The positive sign indicate that individuals with large household size were likely to join micro-credit groups since they have more family burden to contain with, in terms of social and economic services, and therefore need support to meet their family daily needs. Simtowe and Zeller (2006) concur with this stating that having a bigger family, *ceteris paribus* increased the demand for loans, because per capita income is smaller for big households. Doan *et al.* (2010) in the same way support this finding that greater household size represents a bigger demand for consumption and a better ability for income generation and debt repayment. Asante *et al.* (2010) found that household size had no influence on household decision to join farmer based organizations.

Years of formal education (EDUC) was negatively significant in influencing the decision to join micro-credit groups with a marginal effect of 0.087. This demonstrates that an increase in one year of education decreases the probability of joining micro-credit group by 8.7 percent. The underlying assumption is that more years of formal education help households to find paid jobs hence can access formal loans which do not need one to join a micro-credit group. This concludes that increase in years of formal education did not determine micro-credit group participation. This result concurs with those of Aqsa *et al.* (2005) and Nguyen (2007) who found out that years of education of head of household had

negative effect on the access to credit, that if years of education increase there is a significant decrease in participation to credit programme.

Size of farm land (FMSIZE) was significant and negatively influenced household decision to join micro-credit group with a marginal effect of 0.229. The interpretation is that an increase in household land size by one hectare reduces the probability of the household to join micro-credit group by 22.9 percent. This is because large farm sizes can be used as collateral to access formal credit from commercial banks. Those with smaller parcels of land therefore find it prudent to join credit borrowing groups in order to access credit. Asante *et al.* (2010) and Davis *et al.* (2010) found that farm size positively influenced farmers' decisions to join farmer based organizations.

Farming income (LnFRMINCM) was found to be positively significant with a marginal effect of 0.033. This implies that an increase in farming income by one Kenyan shilling increases the probability of joining borrowing groups by 3.3 percent. This concurs with the results of Asante *et al*. (2010) who found that farm income had the expected positive sign and was highly significant. This means that farmers with higher incomes are more likely to join farmer based organizations (FBOs) than their counterpart with lower incomes. Joining FBOs comes with some financial commitments in the form of payment of dues, making of some contributions. Fulfilling these commitments is sometimes difficult for small scale farmers who cannot afford it. As a result, only those with higher incomes can afford to join the credit groups. This contradicts the findings from Kundu and Mitra (2006) who argued that increase in farm income reflects capacity to finance their own spending. Therefore as household income increase, the probability to borrow is expected to decrease hence the household do not participate any form of borrowing. However, when faced with credit constrain household with relatively higher farm income seek individual credit which has high credit limit as compared to the informal credit (Kundu and Mitra, 2006).

Loan interest rate (INTRSTRATE) was significant and negatively influenced households to join micro-credit groups with a marginal effect of 0.051. This means that an increase in loan interest rate by one percent decreases the probability of joining micro-credit group by 5.1 percent. This is because relatively lower interest rate reduces the total amount (principal plus interest) to be repaid and will not strain the borrower unlike when the interest rate is higher. On the contrary the finding of Gill (2003) and Rajeev *et al.* (2005) pointed out that participation to credit programme significantly increases as rate of interest increases.

Distance to the nearest financial institution from the borrowing household dwelling place (DSTNC) was significant and positively influenced individuals decision to join micro-

credit group with a marginal effect of 0.018. An increase in distance to the nearest financial institution by one kilometer increases the probability of an individual joining micro-credit group by 1.8 percent. This is because long distances increase the travelling expenses in seeking for loans. Households are therefore better off joining credit groups since in these groups loan officers visit them at their meeting places cutting down on travelling expenses. This is consistent with the results of Doan *et al.* (2010) who found that household who are far away from the financial institution participated in credit schemes. Diverging from these findings Ayamaga*et al.* (2006) found out that a decrease in distance between MFI and borrowing households increases the chance of participating in micro-credit. Ayamaga *et al.,* 2006 argues that to the rural households, when the time and cost especially through travels is reduced by reduction in distance between credit institutions and rural borrowers dwelling place, then, the cost of credit is also reduced.

4.2.2 Factors Affecting the Level of Micro-credit Group Participation

Table 7 shows Heckman two-step outcome equation results. Both household characteristics and social capital dimensions significantly affected level of participation in micro-credit groups. These include; Age, farm land size, years of experience in group borrowing, total household income, group heterogeneity, group decision making and density of membership.

Age of the borrower (AGE) was significant at 5 percent level and positively affected the household level of micro-credit group participation measured by number of borrowings within the credit group. This implies that *ceteris paribus* as the age of the group borrowers increase they gain more experience and expand in their business or farming activity. To finance their expanding activities the number of borrowings need to simultaneously increase since MFI loans have limits. This result concur with those found by Swain (2007) who stated that with the increase in age, accumulated experience, practical and professional wisdom of the household increased its income generating capability and demanded more credit to explore capabilities or to spend on consumption.

Household farm size (FMSIZE) was found to be negatively significant at 10percent level in explaining the level of participation in micro-credit groups. This means that a unit increase in the farm size reduces the number of borrowings, with small farm size the household will be forced to borrow more in order to meet their basic needs. This can be done by increasing the rounds of borrowing rather than increasing the size of loan. This coroborates with Wanyama *et al.* (2006) findings that farm size significantly influences

farmers participation in loan taking such that the smaller the farm sizes the higher the likelihood of participating in loan taking.

Table 7: Heckman Outcome Equation Results on the Determinants of Level of Participation in Micro-credit Groups in Uasin Gishu County, Kenya

Dependent variable – Number of loan borrowings

Variable	Coef.	Std. Err.	Z	P>|z|
AGE	0.047	0.020	2.37	0.018**
GENDER	-0.241	0.034	-1.52	0.157
HHSIZE	0.023	0.045	0.50	0.615
EDUC	-0.005	0.026	-0.18	0.854
LANDTNR	-0.215	0.159	-1.35	0.177
FMSIZE	-0.134	0.072	-1.87	0.062*
LnTTLINCM	0.694	0.147	4.72	0.000***
GRPSIZE	-0.583	0.072	-3.67	0.247
LnLNSIZE	-0.242	0.184	-1.32	0.188
INTRSTRATE	0.022	0.026	0.84	0.399
EXPERNCE	0.310	0.077	4.04	0.000***
MTNGATNDCINDX	0.003	0.003	1.16	0.245
HETEROINDX	-0.007	0.003	-2.49	0.013**
DECSNMKNGINDX	0.007	0.003	2.32	0.020**
LnCASHCNTRBN	-0.091	0.233	-0.39	0.695
DSTYMBRSHP	-0.375	0.103	-3.64	0.000***
_cons	-4.248	2.885	-1.47	0.141

*, **, *** is significant at 10 percent, 5 percent and 1 percent respectively

Total household income (LnTTLINCM) given by the (sum of farm and off farm income) was significant at 1percent and positively at influenced household number of borrowings. An increase in total income increases the number of borrowings. As the total income increases the household gains confidence to increase the number of borrowings as they are assured of repaying it. The finding is consistent with the findings of Benito and Mumtaz (2006) that income levels influence households' decisions to source microcredit either for investment or consumption purposes.

Experience in group borrowing (EXPERNCE) measured by the number of years one has been participating in the micro-credit group was significant at 1percent level with a positive coefficient. This implies that other things remaining constant an increase in the years experience in the micro-credit group increases the number of borrowings. This can be attributed to the fact that the member learns more about the mechanics of group borrowing scheme, group members and the MFI with increase in years of being a micro-credit group member.

Heterogeneity index (HETEROINDX) negative and significant at 5 percent level in influencing the household level of micro-credit group participation. This means that a unit increase in group heterogeneity index (by 20 points) reduces the number of borrowings. The interpretation of this is that homogenous groups better understand themselves relative to heterogeneous groups since higher level of heterogeneity attracts conflict between members of the group (Yusuf, 2008). These results concur with the findings of Oladele and Olawuyi (2012) who found that heterogeneity index was significant and had a negative effect in improving household welfare in Oyo State, Nigeria. Similarly, (Okunmadewa *et al.*, 2007) found that the likelihood of securing credit from local money lenders, friends, and family decreases as households become more diverse in South-Western States, Nigeria. However, Grootaert (1999) reported that internal heterogeneity of associations improved access to credit.

Decision making index (DECSNINDX) was positive and significantly affected the number of borrowings made by a group member at 5 percent level. This means that a unit increase in the level of decision making index increases the number of borrowings. This supports the findings of Tabi (2009) who found similar results while investigating the causal effect of Household social capital on labor force participation in Cameron. On the converse (Yusuf, 2008; Oladele and Olawuyi, 2012) found that active participation in decision making actually dampens welfare. Since high level of commitment to associations can reduce household welfare.

Density of membership (DSTYMBSHP) was found to be significant at 1percent level and negatively affected the number of borrowings made by the household. This means that an additional membership leads to a reduction in the number of borrowings. This is because members will commit more time and resources to increased number of groups affecting their productivity. This may be lead sanction due to lack of adherence to the required regulations. This is in line with the findings of Okunmadewa *et al.* (2007) who found that an increase in density of membership index decreased the probability of obtaining credit from cooperative,

governmental agency and friends and family. In contrast, Mwangi and Ouma (2012) found that the more the number of groups one subscribes to, the higher the probability of accessing an informal loan.

4.3 Factors Influencing Household Loan Repayment Performance

Tobit regression analysis in Table 8 below was used to determine the factors that influence household loan repayment performance. The table shows that most of the coefficients are consistent with hypothesized relationships, and their tests of significance indicate their importance in explaining the repayment performance of borrowers in micro-credit groups. The variables that were found to be significant in the model include; gender, household size, distance to the nearest MFI, experience in group borrowing, number of visits by loan officer, pressure in the group, density of membership, meeting attendance index and heterogeneity index. The P-values of these variables were significantly different from zero at the 0.1, 0.01 and 0.05 levels of significance while the P-values of other variables were, however, not significant at these levels but were included based on the priori theoretical considerations. The positive signs of experience in group borrowing, number of visits by loan officer, peer pressure in the group, meeting attendance index and heterogeneity index implied that loan repayment capacity increased with increases in these variables. In the contrary, the negative sign of gender, household size, distance to the nearest financial institution and density of membership implied that repayment capacity decreased with an increase in the variable.

The gender (GENDER) of the household was significant at a P-value of 0.019. It however negatively influenced repayment performance. Whereas some studies support evidence to suggest a significant relationship between gender and repayment others have refuted it. The indicate that the probability of repayment by female is 10.7 percent more than their male counterparts in the micro-credit group. This finding confirms the argument of Dyar *et al.,* 2006 and D'Espallier *et al.* (2009) who report that women are considered to be ideal credit targets because of their proven high loan repayment rates when compared to men. Sensitivity of women to peer-pressure and interventions of loan managers has been put forward by Rahman (2001) and Goetz and Gupta (1996) as one of the reasons for laudable women repayment records. This result contrasts the finding of Bhatt and Tang (2002) and Godquin (2004) who reported that men were most likely to repay than women.

Table 8: Tobit Regression Estimates of Social Capital Dimensions and other Factors Influencing Loan Repayment Performance in Uasin Gishu County, Kenya

Marginal effects after Tobit

   y = Pr (100<REPYMTRATE<0) (predict, pr (100,0))

Variable	dy/dx	Std. Err.	Z	P>|z|	X
AGE	0.003	0.006	0.450	0.651	39.517
GENDER (*)	-0.107	0.046	-2.340	0.019**	0.362
HHSIZE	-0.035	0.015	-2.330	0.020**	5.595
EDUC	-0.008	0.008	-1.060	0.289	10.172
LnTTLINCM	0.017	0.052	0.330	0.738	11.619
LANDTNR (*)	-0.007	0.052	-0.140	0.890	0.638
FMSIZE	-0.018	0.025	-0.710	0.479	2.457
DSTNC	-0.005	0.003	-1.750	0.081*	20.440
LnLNSIZE	-0.012	0.064	-0.190	0.853	10.928
INTRSTRATE	0.008	0.009	0.920	0.355	19.888
GRPSIZE	-0.013	0.011	-1.190	0.235	11.095
EXPERNCE	0.067	0.028	2.430	0.015**	2.961
VISITS	0.106	0.028	3.750	0.000***	2.474
PEERPRSRE	0.061	0.033	1.820	0.068*	3.767
LnCASHCNTRBN	0.070	0.079	0.890	0.376	7.101
DSTYMBRSHP	-0.096	0.036	-2.640	0.008***	1.879
MTNGATNDCINDX	0.005	0.001	4.950	0.000***	72.701
HETEROINDX	0.003	0.001	2.840	0.004***	60.172
DECSNMKNGINDX	0.002	0.001	1.630	0.102	75.216

(*) dy/dx is for discrete change of dummy variable from 0 to 1.

*, **, *** is significant at 10 percent, 5 percent and 1 percent respectively

The results revealed an existence of negative influence of household size (HHSIZE) on repayment performance implying that an increase in household size by one person decreases the repayment performance by 3.5 percent. This could have resulted from the fact that large household sizes increased the household head's domestic obligations and thereby constituted divergence of the loan to household consumption stream and hence loan is not used for the intended purpose leading to low repayment performance. The result corroborated to those of Ugbomeh *et al.* (2008) who in their study of loan repayment performance among

women self-help groups in Bayelsa State, Nigeria, found that household size impacted negatively on loan repayment performance of women farmers. To the contrary, Afolabi (2010) found a positive relationship between family size and loan repayment and attributed it to the respondents' extensive utilization of family labour in the farming activities.

Experience in the micro-credit group (EXPERNCE) was found to be significant and positively influenced the repayment performance. This means that an increase in the years of experience by one year increase the repayment performance by 6.7 percent. This is interpreted that with increasing years of experience in the group group, members will understand each other in terms of economic abilities. The group which makes savings will have a large volume of savings which can be used to repay loans in case of members' default. Chirwa (1997) found no significant influence of club experience on credit repayment in assessing the determinants of the probability of credit repayment among smallholders in Malawi.

Distance to the nearest financial institution (DSTNC) was inversely related to loan repayment such that one kilometer increase in institution distance from the borrower will reduce the rate of microcredit repayment by 0.5 percent. The nearer a borrower is to a financial institution, the better was repayment performance. This is because individuals living close to the financial institution is accessible to the loan officer of the microfinance who will provide loan and business advice thereby improving the individual repayment performance. Closeness to the financial institution could also mean that the individual can repay the in small amounts without incurring extra cost of travelling. This result is in line with the findings of Oke *et al.,* 2007 in Southwestern Nigeria.

Number of visits by the loan officer (VISITS) was significant and positively influenced the loan repayment performance. An increase in the number of visits by one day increases the repayment performance by 10.6 percent. Increasing the number of loan officer visits could result in a well trained and motivated group that has low delinquency problems. This result corroborated with the results of Oke *et al*. (2007).

Peer pressure within the group (PEERPRSRE) is positively significant to the loan repayment performance. This implies that a positive increase in the level of group pressure increases the repayment performance by 6.1 percent. The fear of exclusion from the group induces the members to fulfill their obligations of repaying in time. Peer pressure also helps in enforcement of rules and regulations and smooth functioning of the group to meet its objectives. Since most MFIs allow the groups to self-select in their formation, the influence of peer pressure on group performance becomes a highly relevant issue. Similar results were

reported by Wenner (1995) who finds that screening and social pressure in group lending in Costa Rica help increase repayment capabilities of members of the group. Wenner asserts that in rural groups, the group's willingness to exert peer pressure on defaulting members seems to be of primary importance in deterring moral hazard behavior.

Density of membership (DSTYMBSHP) was found to be significant and affected the repayment performance negatively. This imply that an additional membership is associated with a 0.96 percent decrease in repayment performance. Other things remaining constant as individuals increase the number of groups they have active participation, their commitment to the existing group will be compromised which in turn will affect their loan repayment performance. This result contrast with those of Grootaert *et al.* (1999) who showed that an additional membership in a group is associated with an increase in household expenditure per capita.

Meeting attendance index (MTNGATNDCINDX) was significant and positively influenced the loan repayment performance. This means all other factors remaining constant, a unit increase in the group meeting attendance index increased member loan repayment performance by 0.5 percent. As expected, these results indicate that groups whose members were more diligent in attending meetings perform better in loan repayment. This is probably because members who regularly attended their group meetings acquired better farming and business skills leading to higher productivity and hence improve their repayment performance. This could also be because micro-credi group fosters of commitment and trust. Manimekalai (2004) have validated the success of peer monitoring (as a proxy of frequency of meetings) to be a major factor that trigger better repayment performance. Similar results were reported by Wambugu *et al*. (2009) among Smallholder Producer Organizations in Western Kenya. However, Von (2004) found that the high frequency of meetings does not necessarily always lead to high level of mutual control.

Heterogeneity index (HETEROINDX) of the group was also significant and influenced repayment performance positively. This implies that a unit increase in heterogeneity index (represented by 20 points) increases the repayment performance by 0.3 percent. The reason to this could be when people from different age group, gender, education level, occupation and economic status come together they are able to help each other in time of need (for instance during seasons of poor harvest or when the businesses are making losses) to repay the borrowed loan hence improving repayment performance. This finding corroborates those of Wambugu *et al.* (2009) and Grootaert (2001) who found that among social capital dimensions, heterogeneity of a group has a positive impact on organization

level of commercialization and household welfare respectively. Correspondingly, evidence from Bangladesh and Madagascar suggests that economic heterogeneity in the group (especially different income sources) improves repayment rates because of the group's better ability to pool risk (Sharma and Zeller, 1997). The finding however contradicts those of Nagarajan *et al.* (1999) who find that homogenous groups perform better. They argue that membership homogeneity reduces information problems and ensures members have common interest.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The principal objective of this study was to assess the influence of social capital dimensions and other factors in improving low income households' credit access and repayment performance in micro-credit groups in Uasin Gishu County. More specifically, the study was designed to identify the variables, which influence households to participate/join micro-credit group and find out how social capital dimensions affect the level of micro-credit group participation (measured by number of borrowings) and group loan repayment performance. This study found that group borrowing is gaining ground as a tool for enabling households who lack collaterals to access financial capital Moiben division. This emphasizes the role social capital within micro-credit groups could play if harnessed to alleviate lack of credit in rural areas in a country where almost half of the rural population lack accesses to financial capital. Despite the availability of micro-credit groups in Moiben division, the number of borrowings that have been made by group members and the loan repayment performance are still low.

Specifically, findings of the study revealed significant difference in age, farm size, years education, household income, loan size, distance to the nearest financial institution and interest rate between the group borrowers and individual borrowers. As hypothesized, the results show that social capital dimensions and household socio-economic characteristics affects how well a micro-credit group performs both on the number of loans borrowed and group loan repayment performance. In particular, the results indicated that household size, farm income and distance to the nearest financial institution positively influenced a household to join micro-credit group. An increase in any of these factors motivates households to join micro-credit group while a decrease discourages. Age, gender, years of education, farm size and interest rate on the other hand negatively influenced household decision to join micro-credit groups implying that an increase in any of these variables dampens household participation. The level of household participation in micro-credit groups was positively influenced by age, total income, years of experience in group borrowing and decision making index while farm size, heterogeneity index and density of membership had a negative impact on household participation. Group loan repayment performance was positively influenced by experience in group borrowing, number of visits by loan officer, peer pressure, meeting attendance index and heterogeneity index while gender, household

size, distance to the nearest financial institution and density of membership had a negative effect household loan repayment performance. Attention must therefore be given to the group internal factors and other factors, in the design of development strategies that target the poor households' access to credit and repayment performance through micro-credit groups. The study concludes that social capital dimensions are crucial if group lending has to grow to reach a large proportion of the rural inhabitants and improve loan repayment performance.

5.3 Recommendations

Alternatives to bank credit have been used to manage the problem of lack of credit. Group lending is one of them and is rapidly expanding globally offering an attractive credit access opportunity for the low income households in developing countries. The study has drawn attention to information that can guide policy towards influencing micro-credit group participation in recognition of its potential benefits. Therefore, the study has made the following recommendations. Group lending through micro-credit groups has the potential to be increase low income household access to credit and improve their loan repayment performance. This imply that governments, MFIs, NGOs and other lending organizations should take a pro-active role in organizing and facilitating the formation of micro-credit groups and linking them to loans. In addition, the government should encourage micro-credit group formation by eliminating or reducing some of the legislation requirements that are often prohibitive in the formation of such groups. Attention should also focus on younger households and those with lower level of education since they were willing to join and actively participate in group borrowing and. The government should also ensure that households have security of tenure through provision of title deeds to create an incentive for individual borrowing where households are reluctant to join micro-credit groups. Lastly, the government should improve road and market infrastructure in the rural areas to attract private investors and financial institutions this will bring lending institutions closer to the rural households.

5.4 Areas of Further Research

The current study was carried out in Moiben Division, Uasin Gishu County, Kenya which is a small geographical area. Further research should be carried out on a wider scale to determine the importance of social capital dimensions on household access to credit and repayment performance in order to provide results that can be generalised and give accurate policy recommendations. It could also be interesting to incorporate data on rural-urban dichotomy which will bring out more salient issues on the different effects of social capital

dimensions in the two distinct locations. In addition, the effects of growing technological advancement in loan repayment such as money transfer services need to be evaluated.

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