COMPARATIVE ANALYSIS OF MICROFINANCE SYSTEMS IN THE UPPER WEST REGION OF GHANA

PAUL BATA DOMANBAN

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BY

PAUL BATA DOMANBAN (MA Development Studies)

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THESIS SUBMITTED TO THE DEPARTMENT OF AFRICAN AND GENERAL STUDIES, FACULTY OF INTEGRATED DEVELOPMENT STUDIES, UNIVERSITY FOR DEVELOPMENT STUDIES, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DOCTOR OF PHILOSOPHY DEGREE IN ENDOGENOUS DEVELOPMENT

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DECLARATION

Student

I hereby declare that this dissertation/thesis is the result of my own original work and that no part of it has been presented for another degree in this University or elsewhere.

Candidate's Signatures ……..

Date…….

Name: Paul Bata Domanban

Supervisors

I hereby declare that the preparation and presentation of the dissertation/thesis was supervised in accordance with the guidelines on supervision of dissertation/thesis laid down by the University for Development Studies.

Principal Supervisor's Signature:……..…

Date:……

Name: Professor Saa Dittoh

Co-Supervisor's Signature: ……

Date:…….

Name: Professor Seidu Al- hassan

ABSTRACT

The importance of the operations of MFIs on the income of households in northern Ghana cannot be over stated considering the prevalence of poverty in that area. This research compared the microfinance systems in the Upper West Region of Ghana to determine their relative impact on households' income and asset value. Data collection was done using an interview guide and a questionnaire and data analysis was carried out using descriptive statistics, multiple regression, multinomial probit, and propensity score matching. The study revealed that the Upper West Region is endowed with a number of indigenous microfinance arrangements ranging from borrowing from friends and relatives to the provision of farm services either in kind or in cash to father in-laws. The study further revealed that the formal and semi-formal microfinance institutions incorporate some indigenous microfinance features such as group solidarity, "susu" and family ties in their operations particularly in the area of group lending. It further revealed that access to formal credit has the most impact on the income of beneficiaries followed by the semi-formal with indigenous source having the least impact. The study also revealed that interest rate, household income, gender of beneficiary, dependency ratio, years of schooling, access to microfinance information, and repayment period of current loan, household size and group size are major determinants of amount of loan access by beneficiaries. It is recommended that interest rate in the indigenous credit market be regulated by the Bank of Ghana through the application of the banking laws on this sector to ensure a reduction in the exorbitant interest rate charged by operatives within this sector. Indigenous microfinance arrangements and support systems need to be strengthened through the continuous socialisation of the people of the Region on the significance of these arrangements or support systems to ensure that these indigenous arrangements do not become extinct.

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DEDICATION

I dedicate this work to my family, whose support and encouragement have been invaluable.

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LIST OF ABBREVIATIONS

ATE	Average Treatment Effect
ATT	Average Treatment Effect on the Treated
ATU	Average Treatment Effect on the Untreated
VIF	Variance Inflation Factor
BIS	Bank for International Settlements
BOG	Bank of Ghana
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
BRI	Bank Raykat Indonesia
CRECER	Crédito con Educación Rural
CUs	Credit Unions
DD	Double-difference
GDP	Gross Domestic Product
GLSS	Ghana Living Standard Survey
GSS	Ghana Statistical Service
IFAD	International Fund for Agricultural Development
IIA	Independence of Irrelevant Alternatives
IMF	International Monetary Fund
IV	Instrumental Variable
KM	Kernel Matching

MFIs	Microfinance Institutions
NBFI	Non-Bank Financial Institution
NGOs	Non-Governmental Organisations
NNM	Nearest Neighbour Matching
PNDCL	Provisional National Defence Council Law
PSM	Propensity Score Matching
RCBs	Rural and Community Banks
RD	Regression Discontinuity
RM	Radius Matching
ROSCA	Rotating Savings and Credit Association
S&L	Savings and Loans
TUP	Trickle Up Seed

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Households obtain credit through formal and informal lenders. Formal loans are almost entirely for production and asset accumulation, while informal loans are used for consumption smoothening (Barslund &Tarp, 2008). While formal sources of credit are often preferred and recommended over indigenous sources, the latter is more expedient and convenient. This accounts for the existence of indigenous financial sector in even developed nations (Fridell, 2007).

Poor people living in both rural and urban settings are largely unable to obtain financial services from the formal financial sector for some reasons (Littlefield & Rosenberg, 2004). These reasons according to them include; lack of collateral by the poor, limited debt capacity of the poor, inadequate information regarding the use of loans by the poor, limited ability to repay loans, and the high transaction costs associated with servicing many poor clients with small loans. Thus, formal financial institutions usually target the rich in society who have greater capacity and propensity to repay loans and maintain savings. This is supported by Kilic, Serajuddin, Uematsu, & Yoshida (2017) who indicated that almost 90% of borrowers in developed or rich countries have access to credit from formal financial institutions whilst about 60% of borrowers have access to credit from the indigenous financial institutions in developing or poor countries. Globally, it is estimated that formal financial institutions and commercial banks service only 25% of potential clients and serviced only 2% of micro-entrepreneurs (Murray & Boros 2002).

It is in an attempt at overcoming these obstacles that microfinance emerged to provide appropriate financial services to poorer clients such as rural farmers and operators of small businesses. A range of methods, ranging from Revolving Savings and Credit Associations (ROSCAs), traditional kinship networks to NGOs and development projects, and funded by both the formal and indigenous financial sectors, as well as international and domestic donors have been used in the microfinance sector in Africa (Bank of Ghana, 2007).

To meet an unfulfilled demand for financial services by the poor and micro-entrepreneurs, a range of microfinance institutions (MFIs) has emerged over time in Africa. These MFIs are designed on two forms of indigenous financial mediation in poor communities – local savings groups and moneylenders. These institutions do this by expanding, formalising, and modernising the services and transactions offered by them (Harper, 1998). Some of these institutions focus only on making credit available, others are involved in the provision of both deposit and credit facilities, and some are involved only in the collection of deposit from their clients.

Members of low-income communities, desiring to have credit for developing or starting income generating activities, are offered access to financial and nonfinancial services from microfinance institutions. As the name signifies, the savings and loans of the individual poorer clients are small. Microfinance came into being from the appreciation that micro-entrepreneurs and some poorer clients can be “bankable“, that is, they can repay, both principal and interest on time and also make savings, provided financial services are tailored to suit their needs (Ramkumar, Supriyo, & Kaushik 2015). In addition, microfinance is

being advocated as a development strategy to help alleviate poverty in many developing countries.

The term microfinance comprises of two words: micro and finance which signify small credit. However, empirically, the concept of microfinance goes beyond the provision of small credit to poor people. Microfinance is the provision of financial services to the economically active poor who are hitherto un-served by the mainstream financial service provider. Microcredit is commonly defined in terms of loan amount as a percentage of average per capita income (Abiola, 2011).

Bank for International Settlements (BIS) (2010) regards microfinance as the provision of financial services in limited amounts to low-income persons and small, informal businesses. Micro-finance is generally an umbrella term that refers to the provision of a broad range of services such as deposits, loans, payment services, money transfers and insurance to poor and low-income households and their micro-enterprises (Khawari, 2004).

To Christen (1997), microfinance involves a variety of financial services made available to the poor on the basis of commercial and market-driven approaches. Thus, the implication is that microfinance involves the provision of other financial services such as money transfers, savings, insurance, and remittances among others. However, several microfinance practices today continue to concentrate on micro-loans which entail the provision of small credit to the poor with the hope of improving their inputs acquisition, capital base, and labour productivity so as to increase household incomes.

In the view of Otero (1999), microfinance involves the provision of financial services to poor people or low income self-employed. These financial services generally include credit and savings but can also include other financial services such as payment services and insurance. Schreiner & Colombet (2001) see microfinance as an attempt to improve access to small loans and deposits for poor households excluded by banks.

According to Robinson (2001), microfinance generally is an economic development approach that comprises providing financial services, through institutions, to low-income clients. In his view, these services made available by Microfinance Institutions (MFIs) include insurance, credit and savings and that a number of microfinance institutions are additionally into the provision of other forms of social intermediation services such as organisational support, education, health, and skills training in accordance with their development objectives. Thus, microfinance involves the provision of financial services in the form of loans, savings, and insurance to poor people living in both rural and urban settings who are unable to obtain such services from the formal financial sector.

Robinson (2001) and Otero (1999) have indicated that microfinance as a term in the field of development first came to prominence in the 1970s. Robinson (2001), is further of the view that from the 1950s through to the 1970s, the provision of financial services by governments and donors was mainly in the form of subsidised rural credit programmes which often resulted in an inability to reach poor rural households, high loan defaults, and high losses. The 1980s represented a turning point in the history of microfinance in that such

Microfinance Institutions (MFIs) as Grameen Bank and Bank Raykat Indonesia (BRI) began to show that they could provide small loans and savings services profitably on a large scale. They received no continuing subsidies, were commercially funded and fully sustainable, and could attain wide outreach to clients. Robinson (2001), reveals that the 1990s saw an accelerated growth in the number of microfinance institutions created and an increased emphasis on reaching scale and refers to this period as "the microfinance decade". This period is recognised as the time during which microfinance began turning into an industry.

Globally, there is evidence (e.g Sutoro, 1990 in Indonesia; Sebstad & Walsh, 1991 in Nairobi; Mosley, 1996 in Bolivia; Dunn, 2005 in Bosnia and Herzegovina; Panda, 2009 in India; Hoque, 2008 in Bangladesh, Nimoh, Kwasi, & Tham-Agyekum., 2011 in Ghana) that microfinance is successful in reducing poverty. This has culminated in many policy makers deeply involved in finding out strategies that will make microfinance sustainable and available to many poor households now and in the future. Stakeholders in the microfinance industry especially donors and investors are of the opinion that, microfinance should be able to pay for itself, and must do so if it is to reach very large numbers of poor households. In effect, unless microfinance providers are able to charge enough to cover their costs, they will always face scarce and uncertain supply of subsidies from governments and donors.

From the preceding argument, there is so much enthusiasm for microfinance as pointed out by Morduch (2000) when he noted that microfinance institutions that follow the principles of good banking will also be the ones that alleviate the most

poverty since with good banking practices it is possible to cover costs and operate in a sustainable manner to continue serving clients and alleviating poverty. This obviously brings about a kind of win-win situation. The implication of the "win-win" scenario for both the poor and the investor is that institutions that undertake microfinance programmes follow good banking practices with the possibility of making some profit, while the poor continue to benefit by accessing credit that is assumed to be reliable and beneficial to their welfare. Proponents of this argument assume that being able to repay loans by the poor is a good measure that investment made by the poor through these loans are profitable enough. This 'win-win' situation thus gives a good business appeal and has led to many microfinance institutions (MFIs) opting for a commercial approach. However, providers of social-oriented services have questioned the commercialisation of microfinance in respect of the poor. Notwithstanding this, the summit of 1997 on microfinance appealed for the mobilisation 0f $20 billion to be mobilise over a period of 10 years to support microfinance and 2005 was announced as the "Year of Micro-credit" by the UN while in 2006, Prof. Muhamad Yunus and the Grameen Bank he founded in the 1970s won the Nobel Peace Prize award for contributing to poverty reduction (Kiiru, Mbuttu, & Flohberg, 2007).

Mayoux (1999) observed that the zeal concerning the positive impact of microfinance had been viewed as just an assumption. A lot of the interest was based on stories of the benefits and success of microfinance that have been told from around the globe and have gone a long way to transform microfinance from just programmes into a global movement. For example, stories are told of women and their families living on the verge of extreme poverty but once credit

was made available to them, their lives and that of their households got dramatically transformed. Armendariz & Morduch (2005) are however of the view that great stories like these should not take the place of careful statistical investigations. In this respect, tactical approach and information are necessary given that these stories must be applicable to most microfinance across board and to most microfinance beneficiaries.

In Ghana, the microfinance movement has almost assumed the shape of an industry, embracing many NGOs/MFIs, community-based self-help groups, and their federations, co-operatives in their varied forms, credit unions, public and private banks. Over the years, the sector has witnessed significant growth with the emergence of a number of Micro Finance Institutions (MFIs) that are providing financial and non-financial support to the poor in an effort to lift them out of poverty. Access to microfinance and training are crucial for augmenting agricultural production, which has the propensity to alleviate rural poverty. The Ghanaian economy, like the economies of most African countries, has a very small proportion (14%) of her active labour force employed in the formal sector, while the remaining 86% is employed in the indigenous sector (including agricultural/rural sector). Agriculture, which is the mainstay of the Ghanaian economy, contributed about 40% to GDP on the average between 1995 and 2003 and solely employs about 56% of the labour force (GSS, 2012).

It is important to note that in recent times the collapse of MFIs has bedevilled the Ghanaian economy due to a number of factors. In this regard, Boateng, Nortey, Asamanin Barnie, Dwumah, Acheampong, & Ackom-Sampene (2016) conducted a study into the collapse of four microfinance institutions (MFIs) in

the Ashanti Region of Ghana. They found that the collapses primarily were due to unduly risky, unethical and illegal practices, mismanagement and disregard for due diligence, compounded by external factors like macroeconomic instabilities and panic withdrawals, which then pushed the risk levels of the MFIs beyond the point of containment. The authors argued that the 2013 macroeconomic crisis in Ghana only contributed to the pervasiveness of the collapses but that the crisis was not a root cause.

The Northern, Upper East and Upper West Regions in Ghana, whose main source of livelihood is agriculture, are the poorest in the country. In northern Ghana, agriculture employs about 70% of the population compared to the national average of about 56% (Al-Hassan & Diao, 2007). To help remedy the chronic poverty situation of these regions, the area has witnessed an influx of Non-Governmental Organisations (NGOs). Indeed, northern Ghana has one of the highest concentrations of NGOs and yet has not seen much improvement in the poverty situation of the people (Botchway, 2001).

A rigorous empirical analysis on the issue of statistical impact of microfinance in the world began in the1990's and so far, the results of these studies appear highly mixed. Some schools of thought view the relevance of microfinance as a poverty reduction policy very questionable. In the view of Adams & Von Pischke (1992), microcredit is not an effective tool in helping the poor improve their economic well- being. This implies that there are other more important constraints that face small agricultural households including product prices, land tenure, technology, market access, and risk. Gulli (1998) also supports this view by arguing that lack of credit should not be seen as the prime limitation for the

growth and development of microenterprises. He is further of the opinion that a wide range of social and business development services are required by poor people for households and business purposes. He also indicated that percentage income increases associated with micro entrepreneurs below the poverty line are relatively lower than their counterparts above the poverty line following borrowing.

On the other hand, some studies have found that microfinance has a significant positive effect on poverty reduction. Khandker (2005) using a panel household survey from Bangladesh observed that access to microfinance helps to reduce poverty. Pitt & Khandker (1998) using data from three programmes in rural Bangladesh, report that borrowing from group-lending schemes increased consumption of poor households. Morduch (1999) also observed a positive relationship between microfinance and poverty reduction. He, however, noted that microfinance is not the magic solution to a generation of new jobs. Other studies have shown that microfinance may be relevant for the reduction of poverty but does not reach the poorest as often believed. The results from these studies have identified beneficial impacts to the "active poor" but argue that microfinance does not assist the poorest as it is often claimed mainly because it does not reach them (Mosley, 1996, Sharma 2000, Kiiru et al., 2007).

Thus, various groups of studies often report mixed results suggesting the possibility of both positive and negative impacts for different households. Coleman (2006) found that microfinance programmes have a positive impact on the richer households but the impact is insignificant to the other poorer households. In Coleman's (2006) study, richer households were able to

command larger loans to themselves because they sat in influential positions in the village banks as committee members. He argued that it is the size of loans that households were able to acquire that was very important in determining the impact of those loans on household incomes. In the same study, many poor women borrowers dropped out of the borrowing programmes citing the size of loans as too small to make any significant investments that can significantly improve their incomes. Kiriti (2007) concentrates on the impact of microfinance repayment on household assets. The findings are that poor households depleted livelihood assets in the course of loan repayment since the income generating activities were not raising enough profits to repay the loans on time. If microfinance is to become the magic bullet to reducing poverty then it should make beneficiaries less vulnerable to poverty all the time.

1.2 Statement of the Problem

Among the indigenous financial associations, the Susu and Susu collectors are a common feature in different Ghanaian communities. Susu societies are a form of Rotating Savings and Credit Association (ROSCA) and community-based rotating financial savings and credit societies (Gheneti, 2007). These indigenous forms of microfinance which were useful in the past are gradually being relegated to the background due to the emergence of formal financial and microfinance institutions with very little studies on their impact.

Access to deposit and credit facilities and other financial services from formal financial institutions by most poor people and microenterprises in sub-Saharan Africa is very limited. This limited access to financial services from the formal financial sector is quite striking when one considers that in many African

countries the poor represent the largest segment of the population and that the indigenous sector is an important part of the economy. To meet an unfulfilled demand for financial services, a range of microfinance systems (MFIs) has emerged over time in Africa. Some of these institutions concentrate only on providing credit, others are engaged in providing both deposit and credit facilities, and some are involved only in deposit collection.

Based on a study of rural households in the Upper West Region of Ghana, Kotir & Obeng-Odoom (2009) found that beneficiaries of micro-credit divert a significant portion of loans into household consumption; micro-credit has a moderate impact on household productivity and welfare and has a modest impact on rural community development. Some schools of thought are however Skeptical about the significance of microfinance in the development process. For example, Hulme and Mosley (1996) while recognising the important role micro-credit plays in reducing poverty concluded that most modern microfinance institutions are less effective than they should have been. Also, Armendariz & Morduch (2005) observe that even though microfinance can make a real difference in the lives of those served, it is neither a panacea nor a magic bullet against poverty. Even though it works in some places, it cannot be expected to work everywhere and for everyone. Thus, though at the theoretical level, microfinance is said to play a significant role in poverty reduction, empirical work on the role of microfinance in poverty reduction is mixed.

Generally, most researchers concentrate on the formal and semiformal microfinance institutions at the neglect of the indigenous ones. In particular, studies that have been carried out on microfinance in the Upper West Region of

Ghana have not been comprehensive in terms of their coverage of number of institutions and the various systems of microfinance (see for example, Kotir & Obeng-Odoom, 2009). Thus, these studies concentrate on the formal microfinance systems to the neglect of the indigenous or traditional systems of microfinance. This study seeks to bridge this gap by undertaking a comparative analysis of the microfinance systems prevailing in the region.

There are various forms of microfinance systems in Ghana, embracing Susu and Susu collectors, NGOs/MFIs, community-based self-help groups, co-operatives in their varied forms, credit unions, and public and private banks. These microfinance systems are providing financial and non-financial support to people in an effort to lift them out of poverty through an improvement in their income levels. The issue is whether these systems are having any impact on the lives of beneficiaries and their households in the areas they are operating. What indigenous microfinance systems or support systems are available to households? Do formal microfinance providers consider the knowledge system of the people they serve? Which factors determine the amount of loan received by households from microfinance institutions? Which microfinance system has the most impact on the livelihood of households? What factors influence the choice of credit source by households in the Upper West Region?

Finding answers to these questions provides the basis for this study in the Upper West Region. Specifically, the study will focus on a comparative analysis of the formal, semiformal and indigenous microfinance systems in the Upper West Region of Ghana.

1.3 Study Objectives

The main objective of the study is to make a comparative analysis of the formal, semi-formal and indigenous microfinance systems in the Upper West Region of Ghana.

The specific objectives of the study are:

(1) To identify and describe the various types of indigenous microfinance and support systems in the Upper West Region.

(2) To determine whether formal and semi-formal microfinance systems incorporate some indigenous microfinance arrangements in their operations.

(3) To identify and compare the determinants of loan amounts received by microfinance beneficiaries in the Upper West Region.

(4) To ascertain the determinants of choice of credit source among the beneficiaries of microfinance in the Upper West Region.

(5) To examine and compare the relative impacts of microfinance systems on households' incomes and assets value in the Upper West Region.

1.4 Significance of the Study

As indicated earlier, studies on microfinance concentrate on the formal and semiformal microfinance systems to the neglect of the indigenous or traditional systems of microfinance. This study is therefore justified in that: It will uncover the various indigenous microfinance and support systems in the Upper West Region and whether these indigenous systems have any influence on the operations of the formal systems of microfinance. It will also analyse and compare indigenous microfinance system with the formal and semi-formal

microfinance systems in the Upper West Region of Ghana. Results of the comparative impact analysis in particular will lead to the determination of which microfinance system has relatively greatest impact on households. Hence, results of the study will be useful to various actors in the microfinance industry, including government, non-governmental organisations, and microfinance institutions. This study provides policy-relevant information for the design of future programmes.

1.5 Organisation of the Study

This study is organised into five chapters. Chapter one consists of a background of the study, statement of the problem, research questions, and objectives, the significance of the study as well as the organisation of the study. The rest of the study is organised as follows: chapter two covers the literature review which entails the structure of financial systems of Ghana, empirical review on the impact of microfinance on households and determinants of demand for credit. Chapter three constitutes the research methodology and profile of the study area. The profile of the study area covers a description of the upper west region and the three selected municipality and districts. The research methodology also includes research design, sampling approach and sample size, sources and techniques of data collection, conceptual framework, and methods of data analysis. The presentation and discussion of the results are presented in chapter four. The final chapter is made up of summary of findings, conclusion, and policy recommendations.

CHAPTER TWO

THEORETICAL AND EMPIRICAL LITERATURE REVIEW

2.1 Types of Financial Systems Operating in the Ghanaian Economy

There are an array of indigenous, semi-formal and formal financial institutions providing microfinance services to the urban and rural poor in Ghana (Gallardo, 2002). These financial institutions differ in terms of their operations, the services they provide and their target population (Aryeetey, 2008).

Formal financial institutions are licensed by the Bank of Ghana (BOG) to provide financial services which include provision of credit and savings mobilisation from the public. The indigenous financial institutions, on the other hand, are commercial savings and lending activities taking place outside of formal or established financial institutions. Their activities embrace all financial transactions that take place beyond the functional scope of banking and other financial sector regulations (Owusu-Antwi & Antwi, 2010). Semi-formal financial sector refers to those financial institutions that are formally registered but not licensed by the Bank of Ghana. Their activities are not regulated under the financial sector regulations of Ghana. They fall between the formal and indigenous financial markets and include credit unions, village banks and other credit schemes run by non-governmental organisations.

According to Owusu-Antwi & Antwi (2010), the formal banking sector in Ghana does not satisfy the growing need of demand for credit and many borrowers turn to indigenous loan sources. This creates linkages between the formal and indigenous institutions. This section reviews literature on the

different types of financial/Microfinance systems in Ghana, from the more formal and licensed to the less formal and unregulated.

2.1.1 Formal financial system or institution

Formal financial institutions are those that have been incorporated under the Companies Code 1963 (Act 179), and subsequently licensed by the Bank of Ghana (BOG) under either the Financial Institutions (Non-Banking) Law 1993 (PNDCL 328) or the Banking Law 1989 (PNDCL 225) tasked with provision of financial services under Bank of Ghana regulation (Bank of Ghana, 2007). The credit reporting Act, 2007 (Act 726) has also given the Bank of Ghana the authority to monitor the activities of the financial institutions and microfinance institutions to ensure compliance with the prescribed standards and requirements (Bank of Ghana, 2017).

Rural and Community Banks (RCBs) function as commercial banks under the Banking Law. They however, cannot undertake foreign exchange operations; they draw their clientele from their catchment area, and have a significantly lower minimum capital requirement. Collaboration with NGOs is done by some of these banks using microfinance methodologies. These Rural and Community Banks are unit banks with their ownership being through the purchase of shares and under members of the rural community. They are licensed to provide financial intermediation in the rural areas and were first introduced in 1976 to expand savings mobilisation and make credit services available in rural areas not served by development and commercial banks. The number of these banks expanded rapidly in the early 1980s in response to the demand for rural banking services created by the government's introduction of special cheques instead of

cash payment to cocoa farmers. The number of rural outlets of commercial banks were inadequate to meet farmers demand for cashing these cheques, let alone provide other banking services, resulting in undue hardships on farmers who often had to travel long distances or spend days at the banks to cash their checks. More Rural Banks and agencies were, therefore, hurriedly opened to help service areas without banking facilities (Bank of Ghana, 2007).

It is important to note that even though the formal financial system is controlled by the Bank of Ghana, the level of control may not have been very strong due to the large number of commercial banks that collapsed in the country between 2017 and 2019. It may be justified to say that the phenomenal efforts of the Bank of Ghana during this period prevented bank runs and minimised detrimental effects to the wider economy.

2.1.2 The Semi-Formal system

Credit Unions (CUs) and Non-Governmental Organisations (NGOs) are regarded to be part of the semi-formal system, due to the fact that they are not licensed by the Bank of Ghana even though they are formally registered. The poverty focus of NGOs leads them to comparatively deeply reach out to poor clients using microfinance methodologies, though to a larger extent on a limited scale. They normally use external (usually donor) funds for microcredit since they are not licensed to take deposits from the public. Credit Unions are registered by the Department of Cooperatives as cooperative thrift societies that can grant loans and accept deposits from only their members (Bank of Ghana, 2007).

It is imperative that the Bank of Ghana begins to put control measures in place to ensure the smooth operations of these credit unions. This is in view of the recent collapse of some financial institutions in the country which was largely blamed on weak control from the Bank of Ghana.

2.1.3 The Indigenous Financial System

The indigenous financial sector, largely of indigenous origins, is commonly associated with the varied institutions of finance that operate outside the scope of conventional banking and government regulation and covers a range of activities known as Susu, made up of rotating savings and credit associations and individual savings collectors, and savings and credit "clubs" run by the local communities. Other stakeholders in this sector include trade creditors, moneylenders, self-help groups, and personal loans from friends and relatives. Not too long ago the activities of indigenous financial service providers seemed too remote and irrelevant to many experts. But perceptions are changing quickly in recognition of the significance of these indigenous financial service providers (Tuffour, 2002).

2.1.3.1 Moneylenders

Moneylending had become more of a part-time activity by traders and others with liquid funds than a full-time profession by the mid-1960s through to the 1990's. The duration of loans from moneylenders typically average three months and are seldom made for more than 6 months. In the early 1990s, the typical interest rate was 25-30% for a 3-month loan; this represented a decrease from the 1983 rate of 100% on loans under 6 months, reflecting some market sensitivity to lower inflation and increased liquidity in the post-reform period (Aryeetey, 1994). Invariably, moneylenders need security, preferably in the

form of farmland, undeveloped land, and physical assets. Moneylenders Unlike their commercial banks' counterparts, incur little transaction costs in the enforcement of pledges of such collateral made before family members or traditional authorities. This is because the moneylender can make use of the property pending repayment of the debt. Security of loans to employees is often guaranteed by an arrangement with the employer. This is consistent with the Borrowers and Lenders Act, 2008 (Act 773) which stipulates under article 34 section 1 that "In the exercise of right of possession of property that is subject to a charge to secure a borrower's obligations under a credit agreement, a lender is not obliged to initiate proceedings in court to enforce the right of possession". Guarantees or security to loans may also be secured from friends and relatives and from family heads verbally. The significance of individual moneylenders may have been reduced by the emergence of Credit Unions, rural banks, Susu associations and clubs, and especially Savings and Loans Societies.

Official statistics indicate that in 1972, there were 33 licensed money lenders in Accra. By 1988 the number had dwindled to 4 with most individual moneylenders not holding licenses or operate full time (Anin, 2000). Money lenders association has rebranded itself as Micro-credit Association of Ghana to avert the misconception about money lending. According to the Bank of Ghana (2018), as at the end of the year 2018, the number of licensed micro credit associations was seventy (70).

2.1.3.2 The Susu System

The origin of Susu is said to be traceable to Nigeria from where it spread to Ghana during the early 1900s. In the marketplaces of West Africa, individual 'mobile bankers' help traders and others accumulate savings through small daily

deposits. A market woman in Ghana typically sees her 'banker' every day to make small deposits. She gets back her accumulated savings at the end of the month and uses it for replenishing her stock or purchasing items that she could not afford out of one day's profits. She often requests an advance on the month's expected proceeds, but her banker may avoid lending because he lacks cash reserves or access to credit. This 'banker' is an indigenous savings collector, known in Ghana as a Susu collector (Aryeetey, 1994).

Different types of Susu institutions operate in Ghana. These include; Susu Associations or mutualist groups, Susu Clubs, Susu Collectors, and Susu Companies. Susu Collectors are individuals who collect daily amounts set by each of their clients and return the accumulated amount at the end of the month, excluding a day's contribution which serves as a commission. Susu Associations or mutualist groups are of two categories, namely; Accumulating Savings and Credit Associations and Rotating Savings and Credit Associations.

In a Rotating Savings and Credit Association, the members regularly make contributions of an agreed amount over an agreed period of time and a fixed amount is allocated to each member in turn (in accordance with an agreed system established by the group) and in respect of Accumulating Savings and Credit Associations, members make regular contributions to a fund, which may be lent to members or paid out under certain circumstances (e.g. wedding occasion of a member). Susu Clubs, are a combination of the preceding arrangement in which members are committed to saving a targeted sum of money that each decides over an agreed cycle. Susu companies on the other hand, exist as registered businesses with workers who collect daily savings using regular susu collection

methodology. The 'susu' scheme has been one of the innovations in microfinance aimed at helping the poor and financially excluded to cultivate the habit of saving and to have access to uncollateralised loans at affordable rates. It is seen as one of the major components of finance for urban poor entrepreneurs in Ghana (Alabi, Alabi & Ahiawodzi, 2007).

Owing to the significant role of the Susu scheme, almost all rural banks, savings, and loans companies and commercial banks in Ghana have created "susu" departments often called microfinance departments devoted to a daily collection of small deposits from people who otherwise would not have access to the banks. This has made the "susu" scheme a popular tool for savings mobilisation and financial management in Ghana (Adusei & Appiah, 2012).

2.1.3.3 Traders

A major component of rural finance in Ghana has always been the traders who operate between producers in rural areas and urban markets and often provide credit in the form of inputs on supplier's credit or an advance against the future purchase of the crop. Traders do not usually require collateral, but rather the agreement of the farmer to sell them the crop over an agreed period (Steel & Andah, 2008).

2.2 Products and Services of Microfinance Institutions

Microfinance institutions offer a range of products and services towards the development of their clients and their economic activities. These products and services are broadly categorised into two namely; financial products and enterprise development or non-financial products. The financial products and services include loans, savings, leasing, insurance, and fund transfer (Muiruri,

2014; Ijaiya, 2011). The non- financial services include capacity building services to poor entrepreneurs, management and vocational skills training, consultancy and advisory services, marketing assistance, and business linkage promotion (Asiama & Osei, 2007; Ahiabor, 2013).

Microfinance aims at providing cost-efficient services by imparting knowledge and providing information services that improve the human capacity and ability through training and skills development for the effective growth of small businesses. The details of these products/services are provided in the following discussion.

2.2.1 Loans

Microfinance institutions engage in the provision of loans for the individuals and small businesses. Granting of microcredit is a significant function of these institutions. Loans granted through microfinance interventions are used for a range of purposes. These loans are largely used for income generating activities. Beneficiaries of microloans largely repay loans through the profit accrued from the investment of the loan in economic activities. As explained by Rutherford (2000) surplus and savings generated from households overall productive strategies tend to be the main source of loan repayment.

2.2.2 Savings

Various savings products have been introduced by microfinance institutions as part of the products they make available to their clients. This has generated a lot of debate with respect to whether the poor have the capacity to save (Richardson, 2003; Harper & Vogel, 2005). This debate is due to the fact that from a historical perspective, the notion is that the poor are too poor to save any portion of their

income. However, the significance of savings as a means for the reduction of poverty gained prominence in the 1980s when empirical evidence pointed to the fact that the poor are capable of saving and hence should take advantage of saving facilities. (Adams & Graham, 1981). A study carried out by Rutherford, (2000) indicated that the poor are capable of using schemes such as the susu to save part of their incomes. In view of this empirical evidence, it is necessary for microfinance institutions to take care of the savings needs of the poor.

2.2.3 Enterprise Development Services

Microfinance not only provides financial services to the poor but also engages in the provision of enterprise development services. As explained by Ledgerwood (1999), it is expected that microfinance institutions get involved in the provision of non-financial services in addition to the financial services they provide. He is of the opinion that poverty reduction with both non-financial and financial services is very likely to have a positive effect than those without any managerial component. The provision of cost-efficient services through training, transfer of knowledge and provision of information services that improve the human capacity through training and skills development is important for the successful implementation of microfinance programmes or schemes. These services are intended to equip owners of SME with the requisite knowledge and skills to enable them efficiently and effectively manage their businesses. This is expected to eventually help beneficiaries to develop their enterprises, make a profit, and repay loans promptly.

2.3 Models of Microfinance Lending

An attempt to document the various models being used by microfinance institutions led to the emergence of Credit Lending Models throughout the world. Many of these models are formalised versions of indigenous financial systems. The following are some lending models among others.

2.3.1 Credit Unions Model

A credit union is a unique self-help, member-driven, financial institution. It is organised by and comprised of members of a particular group or organisation, who agree to save their money together and to make loans to each other at reasonable interest rates. The members are people with some common bond such as belonging to the same church, labour union working for the same employer, social fraternity, etc.; or living or working in the same community. A credit union's membership is open to all who belong to the group, irrespective of religion, race, or colour. Credit unions are usually democratic, not-for-profit financial cooperative and owned and administered by their members, with members having a vote in the election of committee representatives and directors (Srinivas, 2015).

2.3.2 Rotating Savings and Credit Associations

Rotating saving and credit associations model refers to the situation by which individuals come together to form a group where regular contributions are made in a cyclical order towards a common fund. The lump sum is then given to one of the members in each cycle (Grameen Bank, 2000). Rotating Savings and Credit Associations (ROSCAs), are fundamentally a group of individuals who come together and make regular cyclical contributions to a common fund, which

is then given as a lump sum to one member in each cycle. For example, a group of ten members may contribute five hundred (500.00) cedis per month for 12 months. The 500 cedis collected each month is given to a particular member in accordance with the agreement of the association. Thus, members through their regular monthly contributions will 'lend' money to others. After a member receives the lump sum amount when it is his turn, he then pays back the amount in regular monthly contributions. Deciding who receives the lump sum is done by bidding by consensus, by lottery, or other predetermined methods (Srinivas, 2015).

2.3.3 Intermediaries Model

The Intermediary model of credit lending positions a person or an organisation between the lenders and borrowers. The intermediary plays a critical function of generating credit awareness and educating the borrowers. These activities are geared towards increasing the 'credit worthiness' of the borrowers to a level sufficient enough to make them attractive to the lending institutions. These links developed by the intermediaries could cover training and education, funding, programmes links, and research. Intermediaries could be microenterprise or microcredit programmes, individual lenders, NGOs, and commercial banks whiles lenders could be commercial banks, government agencies, and international donors (Srinivas 2015).

2.3.4 Association or Group Model

Under this model, communities form associations through which various microfinance activities are initiated to offer microfinance services. These groups or associations can be composed of youth, or women; they can be formed around

political/religious or cultural issues; can create support structures for microenterprises and other work-based issues. These associations gather capital and intermediate between MFIs, banks, and their members. All financial activities are managed at the group level. Members make regular savings of fixed amount in a common fund, with the amount and frequency of savings mutually decided by the group. After the successful working of such a group for some months the group is linked to a financial institution for access to credit. The financial institutions issue loan in the name of group and the whole group is considered responsible for repayment. The amount of loan depends upon the total accumulated amount of savings of the group. Loans are granted to selected member(s) of the group first and then to the rest of the members (Ibid 2015).

Most MFIs require a percentage of the approved loan be saved in advance to serve as collateral. Group members are jointly responsible for the repayment of each other's loans and usually meet weekly to collect repayments. This model is grounded in the philosophy that any shortfalls an individual may face is overcome by the collective responsibility and security created with the formation of a group. Some of the benefits of creating a collective body includes: education and building awareness, collective bargaining power, peer pressure etc. For instance, joint liability groups, self-help groups (Amofa, 2018).

Harper (2002) was of the view that, the model serves as an approach to save and credit. This literally implies, members of a group are made of friends and neighbours, therefore opportunity for social interaction is provided and also group peer pressure exists. Groups are usually made up of four to ten people. Also, members collectively guarantee the repayment of loan to a member and

access to subsequent loans to any other member is based on a successful repayment of previous loans taken. Accordingly, payments are usually done on weekly or monthly basis. Additionally, solidarity groups have proven to be effective in deterring defaults, and this is evident of the rate at which loans are repaid experienced in set-ups like the Grameen Bank that uses this model of micro financing. And for the past decade, the use of this model has been very efficient when it comes to repayment of loans (Harper, 2002).

2.3.5 Community Banking Model

Community banking model principally regards the entire community as a single unit and establishes formal or semi-formal institutions through which microfinance is dispensed in a community. Village banks are community-based savings and loans associations and primarily consist of twenty to fifty low-income individuals seeking to improve their lives. Community-based organisations (CBO) differ from solidarity groups in the sense that they seek for the eventual graduation of their members from the lending institutions. Hence, the primary function of CBOs is to develop the financial management capacity of members in order to create a mini-bank, owned and managed entirely by the poor so as to make them independent of lending institutions (Srinivas 2015).

2.3.6. The Grameen Model

Grameen model is based on the concept of joint liability. It is the brainchild of Prof Muhammad Yunus, founder of Grameen Bank in Bangladesh. Grameen model is the most accepted and prevalent micro-finance delivery model in the world today. Many MFIs have accepted the model as it has high focus on standardization and discipline. It has been highly successful in its banking

service to the poor as well as in its poverty alleviation programmes. This model has among others, the following objectives – to extend banking facilities to the poor; eliminate the exploitation of the poor by moneylenders; and create opportunities for self-employment for the unemployed in rural communities (Ibid).

It is important to note that in the Ghanaian context the most widely used models in the microfinance sector include the credit union model, the susu model, the Rotating Savings and Credit Associations model and the group-based lending model.

2.4 Challenges of Microfinance Institutions

MFIs are organizations which were originally set up in order to help finance those small-scale micro-enterprises and local economic activities which were largely excluded from formal finance and mainstream banking practice (Siwale & Ritchie, 2011). Microfinance Institutions however encounter some issues which make the sustainability of microfinance programs difficult. Many of the failures experienced by micro financing and community banking schemes were predicated on the challenges they faced. Microfinance banking is still facing some of these challenges (Ikechukwu, 2012; Opoku Antwi, 2016). In particular, microfinance in Ghana is plague with challenges including poor recovery rate, lack of capital for sustainability, inadequate credit delivery and management, inability to reach the most vulnerable and marginalized, regulation and supervision problems as well as high turnover of MFI staff (Boateng, Boateng, & Bampoe, 2015). Several collapses unprecedented in the MF industry happened in 2013 despite the fact that minimum requirements for licensing by

Bank of Ghana, the regulator had been met (Addo, 2014). Below are some of the challenges MFIs face:

2.4.1 Lack of Policy Guidelines

Microfinance sub-sector, since the 1950s, has operated without specific policy guidelines and goals. This partially accounts for the slow growth of the sub-sector, and the apparent lack of direction, fragmentation and lack of coordination. There has so far not been a coherent approach to dealing with the constraints facing the sub-sector (Asiama & Osei, 2007). As a result, MFIs without policy guidelines lack direction regarding major decision making and implementation.

2.4.2 Overtrading

Overtraded companies face liquidity problems and/or run out of working capital due to the fact that these companies enter a negative cycle, where an increase in interest expenses negatively impacts the net profit, which leads to lesser working capital, and that leads to increased borrowing, which in turn leads to interest expenses and the cycle continues. MFIs were never designed as commercial financial intermediaries. Therefore, opening up branches and behaving like commercial banks does not make them commercial banks. Their indulgence in overtrading is borne out of lack of competence or qualified staff. For instance, instead of investing monies to at least break even on the interest rate offered to their clients, they rather saw these timed investments as free or idle monies and applied them wrongly. In most cases, depositors‟ funds were used in opening branches and making other huge capital expenses (Addo, 2014). This implies that Unknown to these microfinance institutions, opening branches meant more

expenses on utility, salaries and other overhead cost that will over burden and consequently lead to collapse of these institutions. In several instances, funds of depositors have been used to open new branches and make other enormous capital expenses (costly rents, furniture and decorations). Little did they consider, that opening branches means increase in expenditure on utility, salaries and other overhead expenses. Thus, no clear guidelines and policies for MFI operations (Amofa, 2018).

2.4.3 Payment of Higher Interest Rates on Investment

In MFIs quest to remain competitive, they resort to payment of outrageous interest rates to customers of their fixed deposits accounts. A study by Owusu-Nuamah (February, 2014) revealed that because there were so many MFIs springing up everywhere, the Ghanaian market was experiencing what the financial authority calls financial saturation. Therefore, to keep up with the pressure of competition, companies rolled-out products that will endear more clients to them. The study further noted that, some of these products were too costly to the companies; their income streams could not cover some of the expenses they were incurring in the form of interest payment to clients. The most popular of these products were the cement and cloth investment. The products were ran like fixed deposit products where clients deposited Gh¢100.00 (in most of the companies) and took 1/2 piece of cloth or 1 bag of cement whose prices were hovering around Gh¢20.00 for a period of 4-6 months (depending on the competition around).

2.4.4 Inadequate Knowledge of the Industry by Owners of MFIs

The primary purpose of microfinance is to provide loans to poor people at an affordable interest rate in an attempt to enable them to get out of the poverty in which they are entangled (Khan, 2008). Microfinance, therefore, requires highly specialized financial knowledge as well as a unique combination of skills, such as knowledge of social science, local languages and customs. However, most of the owners, normally the Chief Executive Officers (CEOs), took the business as a trade where they moved on to establish their own after a few months of training in other MFIs. Some of the owners did not pay attention to the analysis and consequences of the decisions they were taking. These business owners would not listen to the advice from young financial professionals they had employed, who also had no option but to allow owners to have their way in order to keep their jobs (Owusu-Nuamah, February 2014). They operated their companies as they wished and deemed good, with little or no managerial consultation. Indeed, the MFIs community has experienced major failures, for which inadequacy of corporate governance and management are to blame (Khan, 2008). Good corporate governance can improve firm performance and help assure long term survival. The issue of corporate governance has therefore been of increasing interest for microfinance as it is today considered to be one of the weakest areas in the industry (Mersland, & Strom, 2009). Excessive concentration of managerial authority in owners, alongside the absence of best practices like shareholder ownership and independence of board remain some of the primary reasons for MFIs failure (Amofa, 2018).

2.4.5 Poor Recovery Rate

The major source of income for micro-finance companies has been loans. Unfortunately, this department that required critical analysis has not been given the needed attention. The popular method of asking clients to contribute for a month or two so that their balances could be doubled or tripled downplayed the significance of proper assessment and monitoring of loans. Loan Officer to client ratio widened for most companies, hence, officers did not have enough time to look at loans that were defaulting until the loans hit the expiry region (by then it becomes extremely difficult to recover). Clients identified this loop hole and played these companies by robbing Peter to pay Paul (Owusu-Nuamah, February 2014). In addition, some MFIs have resorted to financing capital intensive projects, which is supposed to be the prerogative of the commercial banks. A cursory study, has also revealed that some MFIs have subsidiaries into which greater portion of their mobilizations are injected as loans. As a result, a failure of a subsidiary amounts to non-performance of such loans, rendering them as bad debt.

2.4.6 Lack of Qualified Staff

A study by Volschenk, Fish, & Mukama, (2005), indicated that staff related problems, such as educational level of staff, skills development of staff, and appropriate staff incentive schemes can adversely impact on the survival of MFIs. The study further noted that such staff related problems are probably the most manageable of the problems that MFIs experience. For example, educational level of staff and skills development of staff can be supported by appropriate incentive schemes in order to facilitate improved quality of loans books, improved quality of service to attract and expand customer base and

retain existing clients. Good staff selection practices can be given incentives through a well-structured commission scheme, which in turn, would lead to fewer fraudulent practices and increased repayment rates. Staff skills upgrade through both external and in-house training may not only increase regulatory and supervisory compliance, but also professionalism of staffs.

2.4.7 Fraudulent Activities by Staff

Another major cause of MFIs failure is fraudulent activities by staff of the companies. These acts are mapped out and executed easily because of weak internal controls, bad accounting software and poor supervision. Staff either create ghost accounts to take loans or record fake expenses. There are also peculiar cases where some of the software the companies are using allow users to delete transactions. Some smart staff manage to delete withdrawal transactions so that their account balance will increase again to allow for more withdrawals (Owusu-Nuamah, February 2014).

2.5 Influence of Indigenous Microfinance Systems on Formal Microfinance Systems

Some commercial banks have introduced savings products modelled after and advertised as susu. In addition, some NGOs have utilised susu collectors to achieve their objectives, notably Action Aid in the Northern and Upper East Regions to reach communities with little or no access to formal financial institutions. In this scheme, community committees select susu collection agents from the local community to work with credit assistants, both to mobilise savings from the remote communities and to collect loan repayments (Quainoo, 1997). In recent times, there is a growing interaction among financial institutions

of different kinds in the marketplace. This is a mechanism that better addresses consumer demand and mitigates market imperfections. Most formal institutions in the developing world are linking up with the indigenous market to increase the supply of funds to meet demand (Aryeetey, 2008). A prominent example of this in the Ghanaian setting according to Aryeetey (2008) is the "susu" collectors linking up with banks. This mechanism brings credit resources with relatively easy access to the doorstep of consumers. It is therefore clear that the formal financial sector recognises the potential of the indigenous financial system in the mobilisation of savings and provision of credit to poor rural households who have been excluded from access to credit from the formal sector over the years.

2.6 Demand for Microfinance

Empirical studies on microfinance have shown that the ability and willingness of households to participate in microfinance programmes are influenced by a number of factors. They are broadly categorised as socio-demographic factors, economic factors, communication factors and factors directly related to the operations of the credit institutions. Some credit institutions have some minimum requirements that consumers are expected to meet in order to participate effectively in the market. These requirements sometimes affect demand for credit.

2.6.1 Socio-Demographic Variables

Socio-demographic determinants of demand for credit often discuss in literature related to credit demand include the age of the household's head, level of education measured by years spent at school, dependency ratio and marital status.

Egyir (2010) in her investigation into the challenges of microfinance among rural women in Ghana reports that religion and other socio-cultural factors are no longer barriers to accessing microcredit. The study maintains that these possible constraints are due to wrong perception, lack of information and low level of education. What this implies is that rural women in Ghana no longer encounter socio-cultural barriers to their access to credit. It is however important to note that this may not be entirely true for all rural women since socio-cultural barriers to the development of rural women still persist in some Ghanaian societies. It also implies that some rural women do not consider microfinance as an investment capital but see it as borrowed funds that can bring disgrace to the family. This is apparent because of lack of education and the required information on the programmes.

Participants in the credit market, therefore, need some level of education to enable them to understand the working of the system especially loans procedures. This suggests a direct relationship between the level of education and household demand for microcredit. In conformity, several researchers found this in different places at different times. Prominent among them include Okurut, Schoombee, & Van der Berg, (2005) and Mpuga (2010) in Uganda, Awunyo-Vitor & Abankwah (2012) in the Ashanti and Brong-Ahafo regions of Ghana, Zeller (1994) in Madagascar, and in Nigeria; Nwaru, Essien, & Onuoha, (2011) and Henri-Ukoha, Orebiyi, Obasi, Oguoma, Ohajianya, Ibekwe, & Ukoha (2011). The positive effect of education on demand for microcredit was observed by the researchers in different credit markets. Okurut, Banga, & Mukungu (2004), Zeller (1994), and Nwaru et al. (2011) draw their evidence from the indigenous sector while Awunyo-Vitor & Abankwah (2012) draw their

evidence from the formal sector. This implies that formal and indigenous credit institutions will often require households to have some level of education for an effective transaction to take place.

Rural development advocates nowadays concentrate on the role of gender in transforming the rural economies. This draws the attention of researchers to test the effect of gender in accessing resources such as investment capital. Empirical studies on demand for microcredit do exclude this in their findings. A number of these studies (Mpuga, 2010; Bendig, Giesbert, & Steiner, 2009) report that males often have a more risk-bearing ability that influences their relatively higher demand for credit. Awunyo-Vitor & Abankwah (2012) share the view that women control few assets and engage in small enterprises with low production that probably do not require external sources of capital. In addition, Petrick (2002) reports that more women in the household in Poland reduces the family creditworthiness. Akudugu (2012) results, however, share a contradictory position on this evidence. His finding is that some microfinance institutions sometimes focus on the productivity of rural women; hence being female increases a person's chance of accessing credit. A study on rural credit demand in China supports this proposition. Tang, Guan, & Jin, (2010) for example, report that female-headed households are more likely to borrow from indigenous market.

Another important socio-demographic variable influencing household demand for microfinance is the age of the household's head. Contrary to the life-cycle hypothesis which postulates that young people are more aggressive to invest and hence will have a higher demand for credit, Tang et al. (2010) results indicate

that older people are more likely to borrow. They, therefore, explain that old people may have more social networks that grant them access to the credit market. Akudugu (2012) maintains that the ability of participants in the credit market to read and understand loan conditions increases over time. This suggests a direct relationship between age and demand for credit. Zeller (1994) and Okurut et al. (2005) results all maintain this stance. Mpuga (2010) reports a quadratic relationship between age and household demand for credit. This implies that credit demand increases with age up to a particular age limit where the likelihood to participate in credit market declines. Although the results of these studies are convincing, the views of other studies appear not to support it. They are studies conducted by Anyiro & Oriaku (2011) and Baiyegunhi, Fraser, & Darroch, (2010). Their justification of the inverse relationship of age and demand for credit is that risk-averse behaviours are often associated with older people hence being old deters one from participating in the credit market. This agrees with Egyir (2010) experience in Ghana about the perception of some people towards borrowing. The mixed effect of age on demand for credit as reported by different studies in different places requires that an empirical study is conducted to find the situation in the Upper West Region.

The composition of the household is often not left out by most researchers when modelling the demand for credit and its determinant factors. Some capture this using dependency ratio (e.g Okurut et al., 2004; Balogun & Yusuf, 2011) while other such as Mpuga (2010) use marital status. It is often believed that large family sizes will require more investment resources to keep the family thus suggesting a direct relationship with demand for credit (Okurut et al. 2004). Similarly, Mpuga (2010) results confirm that married people have more social

problems and that influence them to go for credit. Balogun & Yusuf (2011) multinomial results, however, indicate that households with a high dependency ratio have low demand for credit from Commercial Banks, NGO, and Government Agencies.

2.6.2 Households Economic Variables

Economic indicators of household demand for microcredit are numerous. They span from the earning of the family via engagement in livelihood strategies to the production capacity. As a result, variables frequently captured include the level of income, engagement in another livelihood strategy, the size of the enterprise, asset value, and labour, whether production is done commercially or subsistence.

Okurut et al. (2005) present that credit demand in Uganda increases with household expenditure. Increase expenditure requires more resources and when more resources are needed than what is available, households will resort to borrowed funds for spending. Nwaru et al. (2011) find that farm income in the Akwa Ibom State in Nigeria has a direct relationship with demand for indigenous credit given that high-income earners are motivated to increase bank savings that grant them access to loans. Such high-income earners also have the confidence and ability of loan repayment. While some people engage in additional sources of income to augment the seasonal pattern of farm income, others use that as a guarantee to obtain loans. Financial institutions are often convinced that such livelihood strategies will increase household earning thus granting them the power of repayment in situations of loan default. Studies, therefore, report that engagement in other economic activity has a positive

relationship with demand for credit (Awunyo-Vitor & Abankwah, 2012). Earlier studies such as Zeller (1994) present this from a different perspective. He conducted his study in Madagascar where households who engage in salary work (wage labour) are considered poor. Such households are not able to survive with their earnings alone. This, therefore, increases their demand for credit. The situation in Ghana, however, does not support this premise. For example, Bendig et al. (2009) report that households who are self-employed are credit constraint but poorer people are likely to participate in the credit market than wealthier families. This suggests that poorer households in Ghana are largely not wage earners as in the case of Madagascar.

Some researchers are of the view that the production capacity of the household is a significant determinant of demand for credit. This is often captured in empirical studies using farm size, asset, profit, labour and level of commercialisation. The findings of Petrick, (2002) micro-econometric analysis of survey data demonstrates that credit constraint farmers in Poland own less land. They, therefore, lack the required productive resources such as land to enable them to engage in large-scale enterprises that will grant them access to credit. This is obvious following the result of Henri-Ukoha et al. (2011) that farm size has a direct relationship with loan acquisition. Bendig et. al. (2009) observations in rural Ghana emphasise the role of an asset in the acquisition of credit. They maintain that households with more asset have demand for credit, insurance, and savings. Probit and Tobit models results of Mpuga (2010) maintain a similar stand. He reports that households with more asset value are more likely to apply for credit and this increases with the value of the credit. Okurut et al. (2005) observations in Uganda fail to agree with this hypothesis.

Mpuga (2010) again adds that individuals who engage in industry, administration and commercial sectors have demand for microcredit than those in the agricultural sector. However, the level of agricultural commercialisation has a direct effect on demand for credit (Awunyo-Vitor & Abankwah, 2012).

2.6.3 Communication Factors

Participants of the credit market need to be aware of the mode of operation of the market. The role of communication is therefore important in the analysis of demand for microcredit. Households sometimes become aware of such developments by joining social groups. Other variables often captured include distance to credit institution and access to media.

Most financial institutions are often located in the urban area and this has a positive influence on demand for loans among urban dwellers. Okurut et al. (2005) clearly support this when they argue that demand for credit is higher among households in the urban area than those found in rural areas. Their argument sound convincing because such urban dwellers are closer to the institutions and hence, are better informed of the mode of operations of the market. The view of Awunyo-Vitor & Abankwah (2012) appear to be in conformity with this. They report that proximity to financial institution influence demand formal credit. Balogun &Yusuf (2011) result also agree with the same argument when they report that distance to a credit institution is directly related to demand for credit. They again added that meetings attendance gives most individuals the opportunity to be better informed about credit. They, therefore, argue that the frequency of meetings attendance directly influences demand for a bank, NGO, and government credit.

2.6.4 Supply-Side Determinants

The mode of operations of credit institutions affects household demand. Stringent conditions are often put in place by the institutions which sometimes become barriers to people's desire to obtain loans. As a result, analysis of factors influencing demand often does not exclude the role of interest rate and collateral requirement.

Amidu (2006) studied the link between monetary policy and bank lending behaviour in Ghana. He, therefore, reports that the ability of financial institutions to offer credit when demanded is determined by the size of the bank and its liquidity thus, suggesting that larger banks can attract more deposit and can offer more credit. Banks put in place various mechanisms such as collateral requirements and interest rates policies to avoid default. Awunyo-Vitor & Abankwah (2012), report that some households cannot provide the required collateral to have access to loans which reduces their demand for loans. Owusu-Antwi & Antwi (2010) also confirm that high collateral requirement is one of the main challenges facing a household's demand for credit.

A number of studies (Balogun & Yusuf, 2011; Nwaru et al., 2011; Owusu-Antwi & Antwi, 2010; Amonoo, Acquah & Asmah, 2003) highlight the effect of interest rate on demand for microcredit. They maintain different stands on its direction of influence on demand for credit. Balogun & Yusuf (2011) for instance report a negative effect of interest rate on demand for a loan from moneylenders but positive effect on demand for loans from NGOs and commercial banks. Nwaru et al. (2011) report a negative effect on demand for indigenous loans. Owusu-Antwi & Antwi (2010) see interest rate as the main

challenge confronting households demand for loans thus, suggesting an inverse relationship. Amonoo et. al. (2003) have no doubt that interest rate has a negative effect on demand for credit. They, therefore, recommend that lowering the interest rate will increase the demand for loans. What this implies is that some of the results do not conform to the inverse theoretical relationship existing between interest rate and the demand for loan.

The literature on the determinants of demand for microfinance reveals a wide range of factors that influence clients demand for the services of microfinance institutions. It is however important to note that these studies are conducted in different environments with conflicting results. This justifies the need to find out the situation in the Upper West Region.

2.7 Impact of Microfinance

Microfinance over the years has transformed the lives of households especially those in the developing world. Its effect on livelihood occurs via investment in livelihood strategies. A number of researchers observe this in their empirical investigations. This section looks at the empirical findings of the effects of microfinance by various researchers in various parts of the world.

2.7.1 Impact of Microfinance on Employment Creation and Income Generation

Proponents of microfinance argue that small loans to poor people could serve as a powerful tool for alleviating poverty (Khan & Rahaman, 2007). In line with this assertion, Asiama & Osei (2007) have noted that this is possible because microfinance helps the poor to meet their basic needs and therefore improves

household's income. Similarly, Khan & Rahaman (2007), Robinson (2001), Otero (1999) and Wehrell, Campbell, Cunningham, & Lee, (2002) arguing from a sociological perspective asserted that access to credit provides the poor with productive capital that helps to build up their sense of dignity, autonomy, and self-confidence, and hence are motivated to become participants in the rural economy. Likewise, Pronyk, Hargreaves, & Murdoch, (2007) argue that microcredit presents the poor with income, food, shelter, education, and health and can, therefore, have immediate and long-term consequences on their lives.

Microfinance services contribute directly to the alleviation of extreme poverty by improving the income of poor people. There exist a large body of evidence that links the provision of microfinance to the poor and poverty reduction via the creation of employment, the earning of more regular income, and consumption smoothing (see for example, Zeller, 1999; Vathsala & Fernando, 2017; Ashim, 2017). Providing credit to the poor gives the individual the potential to become economically active; thus, earning more regular incomes; acquiring assets; and becoming collectively less vulnerable to risk. Hossain, (1988) found that credit from Grameen Bank resulted in the creation of new employment avenues for unemployed clients, and extra employment for underemployed clients (mostly women). Maes & Basu, (2005) found that the vulnerable beneficiaries (rural landless, female-headed households, people with disabilities and economically disadvantaged (minorities) of the 'Trickle Up Seed Capital' (TUP), a microfinance scheme in rural India invested their funds on assets purposely to expand their income generating activities. This enabled them to earn a more regular income during the farming season than before. Although most of the employment generated was seasonal, clients worked until the end of

the season. Also, the number of income generating ventures for TUP clients increased by 41 percent. This helped not only to improve household income but also to reduce risk and vulnerability. Additionally, they found that before the TUP project, the average annual income for the greater number of clients was in the lowest two income categories (below 5,000 Rs and between 5,000 Rs to 10,000 Rs). After they joined the scheme, Maes & Basu (2005) found that all members had average annual income greater than 5,000 Rs, and at least every member had moved one level up the income ladder.

Hartarska & Nadolnyak (2008) used Living Standards Measurement Survey data for Bosnia and Herzegovina, and the microfinance industry annual survey report 2001 (in that country) to evaluate the impacts of MFIs. They found that new clients of microfinance schemes enjoyed increases in household income and employment. They claimed that other reports show a higher income for members of microfinance programmes compared to non-clients with comparable characteristics from the same sample. In a study conducted in Lombok, Indonesia. Moreover, in Ghana, MkNelly & Dunford (1998) found that clients increased their income by $36, compared with $18 for non-clients. Clients of microfinance generally shifted from irregular, low-paid daily jobs to more secured employment in India (Simanowitz, 2003) and Bangladesh (Zaman, 2000). Filipino beneficiary households of microfinance experienced increased income, consumption, and capital (Chowdhury, 2004). Again, in Bangladesh, Pitt & Khandker (1998) find that programme participation has positive impacts on household income, production, and employment, particularly in the rural non-farm sector, and that the growth in self-employment was achieved at the expense of wage employment, which implies an increase in rural wages. Khandker,

Samad & Khan (1998) studied village-level effects of microcredit programmes on income and employment in Bangladesh using the three most important micro-credit programmes of Bangladesh, namely Grameen Bank, Bangladesh Rural Advancement Committee (BRAC), and Bangladesh Rural Development Board's (BRDB) RD-12 project. Descriptive and econometric analyses of their study showed that these programmes have positive impacts on income, production, and employment, particularly in the rural non-farm sector. Their study also revealed that growth in self-employment was achieved at the expense of wage employment, which signified an increase in rural wages. Kamal (1996) noted higher rates of per capita income among Micro Credit programmes borrowers compared to those who did not borrow. Chowdhury, Mahmud, & Abed (1991) asserted that women participating in BRAC sponsored activities have more income (both in terms of amount and source), own more assets and are more often gainfully-employed than non-participants.

Studies conducted by Mustafa et al. (1996), Pitt & Khandker (1998), Kamal (1999), Latifee (2003) and Hoque (2008) on several microfinance organisations clients in Bangladesh noted that participation in a microfinance programme improved poor households' ability to generate income which culminates in an improvement in household income, net working capital, fixed assets, increase spending on food, medical facilities, and children's schooling. Waheed (2009) raised the question "Does microcredit improve the well-being of borrowers in the Punjab (Pakistan)?" The result of his multiple regression analysis confirmed that credit is a significant determinant of household income. The result of Ahmad (2011) does not deviate from this observation when he reports that the effect of credit on farm output is positive. The results of several other studies are

invariable, given the direct relationship between credit and income of households. For instance, Nimoh, Kwasi, & Tham-Agyekum, (2011) carried out a study on the effect of formal credit on the performance of the poultry industry in Ghana. They observed that net income of poultry enterprise was higher for credit users than non-credit users.

Meyer (2002), surveyed available evidence from Asian countries and concludes that while access to microcredit seems to have an overall positive effect on income and education, results differ substantially across countries and programmes both in magnitude and statistical significance and robustness. Zeller, Sharma, Ahmed, & Shahidur (2001) present evidence that credit access has a significant and strong effect on income generation and food and calorie consumption. Based on a selection of microfinance institutions in Bolivia, Mosley (1999), states that microfinance makes a considerable contribution to the reduction of poverty through its impact on income and also has a positive impact on asset level.

In their investigation on the effects of microfinance programmes on wages and employment, Pitt & Khandker (1998), arrive at the conclusion that access to microfinance increases wages and self-employment of beneficiary households. Quinones & Remenyi (2014), reveal in their study of the impact of microfinance on the income of clients that income of households with access to credit is significantly higher than that of a comparable group of households without access to credit. They specifically find a 12.9 per cent annual average rise in income of borrowers in Indonesia and a 3 per cent rise for non-borrowers (control group); in Bangladesh, beneficiaries of microfinance experienced a 29.3

percent annual average rise in income against a 22 percent annual average rise in income for non-beneficiaries; in Sri-Lanka, a 15.6 percent rise of beneficiaries income and 9 per cent rise for non-beneficiaries; in the case of India, 46 percent annual average rise in income was reported among borrowers with a 24 percent increase reported in the case of non-borrowers.

2.7.2 Microfinance and Consumption Smoothing

Consumption smoothing is an area in which poor people who have borrowed from MFIs have benefited and reduced their vulnerability to fluctuating incomes (Morduch, 1999). In one of the most cited studies of group-based programmes, Pitt & Khandker (1998) made a detailed study of three leading MFIs in Bangladesh and found that women borrowers had their household consumption increased by 18 takas with every additional 100 takas borrowed. With the improvement in income earnings, 5 percent of borrowers in the same study moved out of poverty annually after participating in microfinance schemes. The benefits were sustained over time, with spill over effects and increased economic activities at the village level. These results were corroborated by Khandker (2005), who employed expanded panel data to improve on Pitt & Khandker's (1998) model. Microfinance allows poor people to diversify and increase income sources, the essential path out of hunger. Diversification makes people more resilient to external shocks.

In their study in Lombok, Indonesia, Panjaitan-Drioadisuryo, & Cloud (1999) reported that 93% of microfinance members ate three meals a day, compared with 51% of non-members). In Bangladesh, a study on MFI clients found that fewer members suffered from severe malnutrition (relative to the control group),

and, more importantly, the extent of severe malnutrition declined as the length of membership increased (Chowdhury & Bhuiya, 2001). Pitt & Khandker (2002) find that microcredit can help smooth seasonal consumption. Their results indicate that households' participation in microcredit programmes is also motivated by smoothing seasonal pattern of consumption and male labour supply and that the effect of microcredit on consumption smoothing is greatest in the lean season. Swain & Floro (2007) in a study of five Indian states; and Hoque (2008) in a study of Bangladesh conclude that microfinance programmes have succeeded in improving households consumption as well as income vulnerability among beneficiaries.

2.7.3 Microfinance and Improvements in Children's Education

Studies show that children of MFI clients are likely to attend and stay in school longer. Student drop-out rates are also much lower in MFI client households. Simanowitz & Walter (2002), revealed that the increase in income and empowerment gained from microfinance programmes directly relate to improvements in the education of children. Pitt & Khandker (1998) likewise found a strong statistically significant impact on the credit to female clients of the Grameen Bank on girl child enrolment. A 1 percent increase in lending to female clients was associated with an increase in girl child enrolment by 1.86 percent on average.

Using data collected in 2000 for CRECER scheme, and 2001 for the Batallas scheme (both in Bolivia), Maldonado & Gonzales-Vega (2008) found that rural household microfinance clients who received credit for more than a year were more likely to keep their children in school than clients who had just joined the

programmes. They found that the children of 'old clients' of both Batallas and CRECER have a lower schooling gap of about half a year and a quarter of a year respectively, as against more years in schooling gap for children of 'new clients' of these programmes. A study in Bangladesh found that basic competency in reading, writing, and arithmetic among 11- to 14-year-olds in member households increased from 12 to 27% between 1992 and 1995. In non-member households, only 14% of children could pass the education competency tests in 1995 (Chowdhury & Bhuiya, 2001). Findings of Malhotra, Schuler, & Boender (2002) have shown that after participating in a group-based microcredit programmes, women become more conscious about their families' welfare, which ultimately leads to positive outcomes in child health and education as well as household wellbeing. Studies conducted by Sutoro (1990) in Indonesia, Sebstad & Walsh (1991) in Nairobi, Mosley (1996) in Bolivia, Dunn (2005) in Bosnia and Herzegovina, Panda (2009) in India also noted similar positive impacts of microcredit.

2.7.4 Impact of Microfinance on Assets Ownership and Empowerment

A majority of microfinance programmes generally target women who are often more financially responsible at repaying than men as clients, providing them with direct control over resources. Assessment of microfinance across the world has generally indicated that the involvement of female clients' in decision-making increased after they joined microfinance schemes.

Specifically, in Nepal, in a study on Women's Empowerment Project (a local microfinance scheme) Ashe & Parrott (2001), found that 68 percent of women experienced improvements in participation in decision-making on family

planning, children's marriage, and the buying and selling of properties. In Bangladesh, empirical findings by Hashemi, Schuler, & Riley (1996) showed that microfinance schemes had empowered women in at least three areas – namely, making small purchases by themselves, being part of the decision-making process in the family, and taking part in political activities as well as in public advocacy. In addition, they found that female clients of microfinance schemes in Bangladesh (Grameen and BRAC clients specifically) were significantly empowered compared to their counterparts that were not beneficiaries of microfinance schemes. Their assertion was based on physical mobility, ownership, and control of productive assets (including homestead land), political involvement and awareness on important legal issues.

Pitt & Khandker (1998), also found an increase in the non-land asset ownership by women when they received an increase in credit. Clients of the BRAC, the BRDB and the Grameen Bank on the average increased their asset ownership by 15, 29 and 27 taka respectively when they receive an increase in credit by 100 taka. In another study, Pitt, Khandker, & Cartwright (2006) widened their survey coverage to 8 different microfinance programmes in Bangladesh. They found that women borrowers have been empowered in the purchasing of resources, mobility and networking, and transaction management among others.

Female clients of MFIs in the Philippines, Nepal, Bolivia, and Bangladesh have become elected officials. Female MFI clients organised a campaign for democracy during elections and organised rallies for better wages, female worker rights, and legal changes in Russia and India respectively (Littlefield, Murduch, & Hashemi, 2003). Akudugu (2012) adds that credit is an

empowerment tool which unlocks rural potentials and transforms the self-image of the poor in Ghana.

In the view of Javed, Luqman, Khan, & Farah, (2006), credit is a better tool for empowering and raising living standards of females in Pakistan. Besides, the study by Egyir (2010) on rural women and microfinance in Ghana points out that microfinance improves women social empowerment via training in group work, leadership and interpersonal skills. They indicate that such women are encouraged to save and become functionally literates. McKernan (2002) finds that programmes participation can exert a large positive impact on self-employment profits. In a related study, Pitt & Khandker (1998) find that programmes credit has a significant impact on the well-being of poor households and that this impact is greater with women clients. According to Mayoux (2001) microfinance has a great impact and a positive contribution towards women empowerment, education of children, health facilities and other socioeconomic factors of the poor community.

2.7.5 Microfinance and Enterprise Development

Schreiner & Colombet (2001) drawing their evidence from rural Argentina, observed that when the poor are neglected by banks, microcredit becomes the only rural development intervention that offers investment capital for production to take place. They however, explained that the material conditions of households do not permit microfinance technologies to reach the poor. Prominent of such conditions include a weak culture of repayment and adverse selection of credit beneficiaries.

Focusing on the role of investment, Anderson, Locker, & Nugent (2002) maintain that microfinance allows entrepreneurs to invest towards an improvement of income to enhance livelihood. Consistent with this observation, other studies such as Roth (1997) believe that microcredit is an investment tool which promotes the culture of entrepreneurship. In the view of Mishra & Nayak (2004), access to microcredit is a necessary condition for rural enterprise development. Alabi et.al (2007) discover that "Susu" a traditional indigenous banking system generally contributes to the development of Small and Medium Enterprises though this is very effective for the unorganised ones than those well-organised. Ayaz & Hussain (2011) studied the impact of institutional credit on production efficiency. Results of their Cobb-Douglas functional form of stochastic frontier analysis reveal that credit availability is more important than any resource in the production process.

2.7.6 Conclusion on the Impact of Microfinance

From the preceding review of the impact of microfinance, it is realised that empirical studies point to the positive effects of microfinance in enhancing livelihood drawing evidence from different places. Others however, hold a divergent view on the impact of microfinance from their empirical investigation as can be seen in the following studies: Amin, Rai, & Topa, (2003) for instance, raised the question: "does microcredit reach the poor and vulnerable" In an attempt to answer this question, they draw evidence from Northern Bangladesh. Their results indicate that microcredit reaches the poor but not the vulnerable. Mallick (2002) added his voice with the belief that the transformations claimed by proponents of microcredit are exaggerated. He added that microfinance programmes need government intervention such as subsidy to be effective.

Adams & Bartholomew (2010) are not convinced that microfinance actually alleviates poverty. Their empirical survey of 100 participants of the microfinance programmes in Ghana reveals that its impact on the well-being of the people is marginal.

From the empirical review, it can be concluded that studies on the impact of microfinance interventions are partial and disputed. At one extreme are studies arguing that microfinance has very beneficial economic and social impacts and at the other are studies which caution against such optimism and point to the negative impacts that microfinance can have. In the ‘middle' are studies that identify beneficial impacts but argue that microfinance does not assist the poorest, as is so often claimed. Empirical literature, therefore, reveals that findings on the impact of microfinance vary considerably from study to study, location to location and institution to institution, suggesting that impacts are highly contextually specific.

2.8 Review of Impact Assessment Methodologies

Microfinance programmes and institutions have increasingly become an important aspect of strategies of poverty alleviation or promotion of micro and small enterprise development. Given this state of affairs, the assessment of microfinance programmes remains an important field for researchers, policy makers and development practitioners. This section reviews the methodological alternatives for assessing the impacts of microfinance programmes.

An impact assessment (IA) is a study to identify changes from a programme by employing methods to establish a plausible association between an intervention and changes experienced by participants of that intervention. A simple paradigm

for an impact assessment is: X causes Y or a programme results in changes. In reality, however, other factors intervene to influence the impacts (e.g., gender, the role of enterprise income in the household, the location of the enterprise). Also, Y might change irrespective of X. So, it is necessary to pay attention to attribution and rule out plausible rival reasons about why the changes may have occurred. The level and nature of programmes participation should affect the impacts of the programmes so this needs to be considered. Impact Assessment may link an institutional review of programmes components and procedures with client-level data to determine what is working well and what can be improved. (Barnes & Sebstad, 2000).

The measurement of the impacts of microfinance projects is obviously fraught with a number of methodological problems. One such problem is the difficulty of estimating the counterfactual situation in order to compare with the factual conditions of the target group. Thus, the main challenge of an impact evaluation is to determine what would have happened to the beneficiaries if the programmes had not existed. A beneficiary's outcome in the absence of the intervention would be its counterfactual. Ideally, one would like to compare how the same household or individual would have fared with and without an intervention or "treatment." But one cannot do so because at a given point in time a household or an individual cannot have two simultaneous existences (a household or an individual cannot be in the treated and the control groups at the same time). Finding an appropriate counterfactual constitutes the main challenge of an impact evaluation.

It is encouraging to note, however, that over the years some progress has been made in developing methodologies that address this problem. In fact, impact assessment methodologies are being improved through the application of methods like "with" and "without" approach (comparison between treated and non-treated groups when both are eligible to be treated), before and after approach (comparison of outcomes of treated groups before and after they are treated) and pre-project baseline studies. These methods help not only in assessing the situation but also in reducing memory difficulties of respondents. This study has adopted the comparative impact assessment approach to deal with the issue of the counterfactual. This is due to the fact that the counterfactual in a comparative study is how clients would have fared if they had participated in a different microfinance programme. The comparison is between programme outcomes across systems, not between groups that participate and groups that do not (Jesse, 2010).

Impact evaluation spans qualitative and quantitative methods, as well as ex-ante and ex-post methods. Qualitative analysis, as compared with the quantitative approach, seeks to gauge potential impacts that the programmes may generate, the mechanisms of such impacts and the extent of benefits to recipients from in-depth and group-based interviews. Qualitative assessment on its own cannot assess outcomes against relevant alternatives or counterfactual outcomes. That is, it cannot really indicate what might happen in the absence of the programmes. Whereas quantitative results can be generalizable, the qualitative results may not be. Nonetheless, qualitative methods generate information that may be critical for understanding the mechanisms through which the programmes help beneficiaries. Quantitative methods span ex-ante and ex-post approaches. The

ex-ante design determines the possible benefits or pitfalls of an intervention through simulation or economic models. This approach attempts to predict the outcomes of intended policy changes, given assumptions on individual behaviour and markets. Ex-ante analysis can help in refining programmes before they are implemented, as well as in forecasting the potential effects of programmes in different economic environments. Ex post impact evaluation, in contrast, is based on actual data gathered either after programmes intervention or before and after programmes implementation. Quantitative analysis is important in addressing potential statistical bias in programmes impacts. A mixture of qualitative and quantitative methods (a mixed-methods approach) might, therefore, be useful in gaining a comprehensive view of the programmes' effectiveness (Khandker, Koolwal, & Samad 2010).

Rao & Ibanez (2005) combined qualitative and quantitative methods in their study on the impact of Jamaica Social Investment Fund Programmes. They conducted semi-structured in-depth qualitative interviews which revealed important details about social norms, motivated by historical and cultural influences that guided communities' decision making and therefore the way the programmes ultimately played out in targeted areas. These interviews also helped in matching communities, because focus groups were asked to identify nearby communities that were most similar to them. Qualitative interviews were not conducted randomly, however. As a result, the qualitative interviews could have involved people who were more likely to participate in the programmes, thereby leading to a bias in understanding the programmes impact. A quantitative component of the study was therefore also included. Propensity score matching was used to compare outcomes for participating and non-

participating households. Matching was conducted on the basis of a poverty score calculated from national census data. Matching in this way allowed better comparison of targeted and non-targeted areas, thereby avoiding bias in the treatment impacts based on significant observed and unobserved differences across these groups.

A number of different methods including Randomized evaluations, Propensity Score Matching (PSM), Double-difference (DD) methods, Instrumental Variable (IV) methods, and Regression Discontinuity (RD) design can be used in impact evaluation to address the fundamental question of the missing counterfactual (see for example Ansah et. al, 2016: Issahaku, Abu, & Nkegbe, 2018). These methods vary by their underlying assumptions regarding how to resolve selection bias in estimating the programmes treatment effect. Randomized evaluations involve a randomly allocated initiative across a sample of subjects (communities or individuals, for example); the progress of treatment and control subjects exhibiting similar pre-programmes characteristics is then tracked over time. Randomized experiments have the advantage of avoiding selection bias at the level of randomization.

In the absence of an experiment, PSM methods compare treatment effects across participant and matched non-participant units, with the matching conducted on a range of observed characteristics. PSM methods, therefore, assume that selection bias is based only on observed characteristics; they cannot account for unobserved factors affecting participation. DD methods assume that unobserved selection is present and that it is time-invariant—the treatment effect is determined by taking the difference in outcomes across treatment and control

units before and after the programmes intervention. DD methods can be used in both experimental and non-experimental settings. IV models can be used with cross-section or panel data and in the latter case allow for selection bias on unobserved characteristics to vary with time. In the IV approach, selection bias on unobserved characteristics is corrected by finding a variable (or instrument) that is correlated with participation but not correlated with unobserved characteristics affecting the outcome; this instrument is used to predict participation and RD method is an extensions of IV and experimental methods; it exploits exogenous programmes rules (such as eligibility requirements) to compare participants and non-participants in a close neighbourhood around the eligibility cut-off (Khandker et. al. 2010).

Selection bias is one of the largest threats to validity in microfinance impact studies because clients differ substantively from most community members so control groups are difficult to construct. Comparative impact analysis, though, does not suffer from the same problem because clients no longer need to be compared to a group of non-participants. Impact studies are interested in the counterfactual of how programmes participants would fare if they had not borrowed from an MFI, so a comparison group of non-clients is necessary. But the counterfactual in a comparative study is how clients would fared if they had participated in a different microfinance programmes. The comparison is between programmes outcomes across systems, not between groups that participate and groups that do not. All of the subjects in the study have already self-selected into a microfinance system (Lecy, 2010).

The literature informs the choice of beneficiaries of indigenous microfinance system as the control group and beneficiaries of formal and semi-formal microfinance systems as the experimental groups since, the comparison is between programmes outcomes across systems, not between groups that participate and groups that do not. Also, since all of the subjects in the study have already self-selected into the various microfinance systems, it is appropriate to use them for the study so as to deal with the problem of selection bias.

2.9 Theoretical and Conceptual Framework

2.9.1 Theories of Microfinance

Over the past years, MFIs have adopted innovative techniques of providing microfinance services to the poor, especially in. Two main approaches on the role of microfinance intermediation in can be identified (Remenyi, 2002). In terms of the first approach that is portrayed as the Minimalist Approach the MFIs offer only financial services in the form of credit. These MFIs are unwilling to provide non-financial services due to multiple reasons ranging from high administrative costs to high transaction costs. In that sense, the primary focus of these MFIs is institutional profit and viability. On the other hand, MFIs that follow Credit-plus Approach provide other services in addition to financial services. These non-financial services may include skill development, training, educational activities, marketing assistance, supply of inputs and business development services. Business development services includes technical assistance and services such as training on business and financial management, accounts/book keeping. According to them, the provision of credit alone will not

guarantee that the receivers of credit use scarce capital in productive manner so that the recovery of loans is not ensured. These services that include mainly the services that would assist entrepreneurs and the self-employed in developing their businesses are provided with, or prior to, the provision of key financial services, namely credit facilities. It is interesting to note that these services are increasingly being recognized as an important component of microfinance intermediation as they are associated with the viability and sustainability of the enterprise. Moreover, it is believed that the viability and sustainability of enterprises will in turn ensure financial viability and sustainability of the relevant MFIs. In the study area, these two theories are observed. Specifically, the indigenous microfinance system operates along the Minimalist approach whiles the formal and semiformal systems operate along Credit-plus Approach.

This study adopts the theory of change for its theoretical basis and subsequently developed a conceptual framework from this theory and the literature review.

2.9.2 Theory of Change

The transmission channels through which microfinance is expected to impact poverty are complex. They involve inputs, outputs, and outcomes. This is often referred to in the literature as 'theory of change': how 'the intervention is expected to have its intended impact' (White 2009: 274).

Theory of change relies on theoretically grounded underlying assumptions that connect causal relationships from policy to outcomes. Theory of change entails the process of exploring change and how it happens – and what that means in a particular context, sector, and/or group of people. This theory is a process that explains how a given intervention, or set of intercessions, is anticipated to result

in a specific development change, drawing on a causal analysis based on available evidence. A theory of change also helps to identify solutions to effectively address the causes of problems that hinder progress and guide decisions on which approach should be taken, considering comparative advantages, effectiveness, feasibility and uncertainties that are part of any change process. A theory of change further helps to identify the underlying assumptions and risks that will be vital to understand and revisit throughout the process of an intervention to ensure the approach will contribute to the desired change (Connell & Kubisch, 1998).

Within the context of this study, the three microfinance systems provide families with microfinance services such as loans as an intervention for these beneficiary families to overcome the problem of poverty through the generation of income and the accumulation of assets. Based on this theory the following conceptual framework has been developed to provide a theoretical basis for this study.

2.9.3 Conceptual Framework

Following from the literature review and the theory of change, the conceptual framework developed for this study is illustrated in Figure 2.1. The framework has three parts as indicated in Figure 2.1; the first part encompasses households which have received microfinance services from formal microfinance system, the second part comprises households which have received microfinance services from semi-formal microfinance system, the third component comprises households which have received microfinance services from indigenous microfinance system. The rationale for having three parts is to make a comparison of the effects of indigenous microfinance system on beneficiary

households (control group) using the two groups of beneficiaries of formal and semi-formal microfinance systems as experimental groups.

Figure 2.1 shows that formal, semi-formal, and indigenous microfinance systems provide microfinance services such as loans to their respective clients (beneficiary households) who have applied for such services for investment in various economic activities based on certain factors such as, gender; age; income level; distance; educational status; interest rate; group formation; and information about lending institutions among others. The use of loans from these microfinance systems is expected to lead to Changes in social and Economic circumstances of beneficiary households and with time result in some outcomes in the form of asset accumulation, increased income, increased employment, improved consumption, and improved child education. The outcomes of the beneficiaries of indigenous microfinance system are matched with the outcomes of beneficiaries of formal microfinance system and then with the outcomes of the beneficiaries of the semi-formal microfinance system. Thus, beneficiaries of formal and semi-formal microfinance systems in the case of each of the comparison will serve as the experimental group and the respective differences between these and the control group is the effects of the intervention of microfinance. These effects will be compared to determine the relative effects of the three systems using the outcomes of the control group as a point of reference.

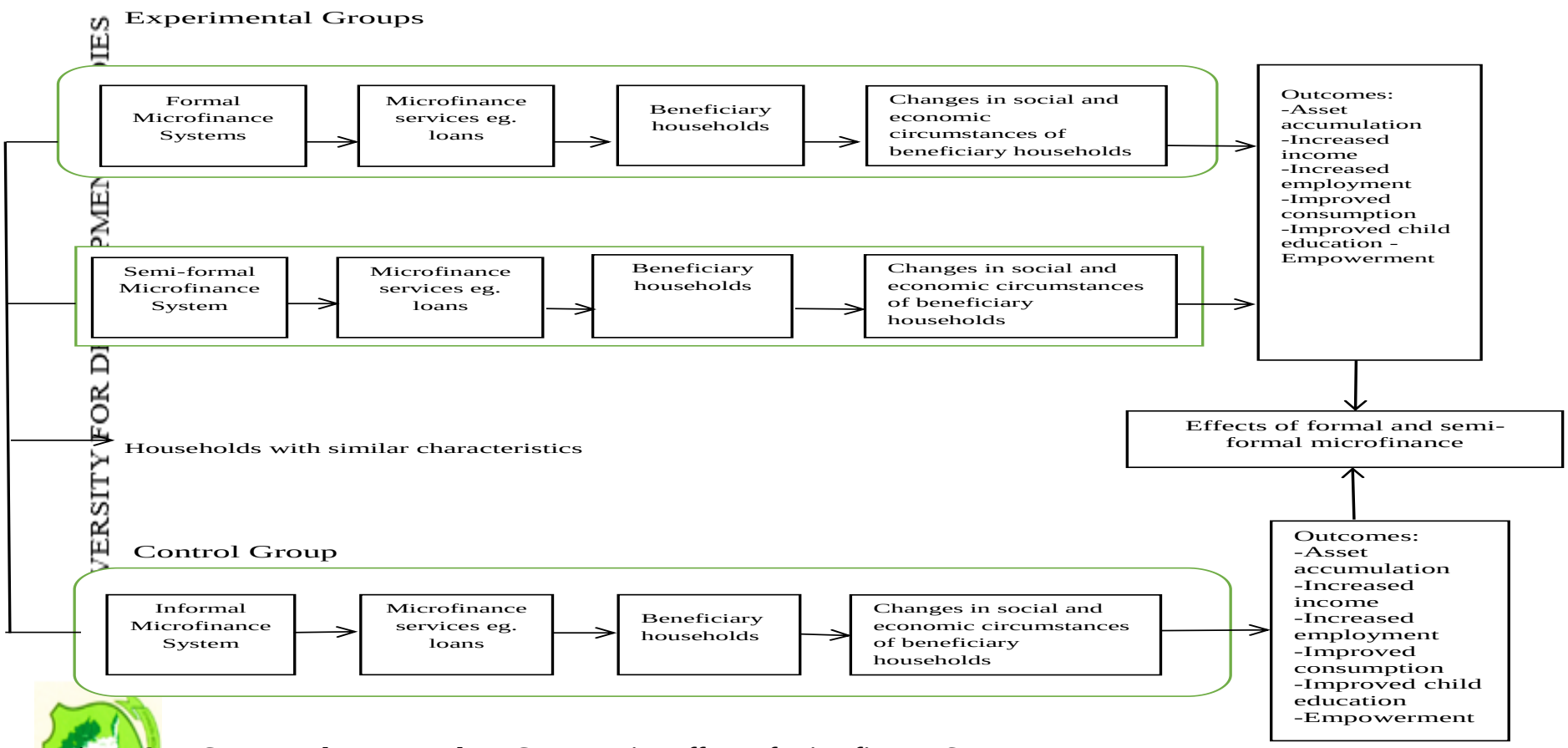

Figure 2. 1: Conceptual Framework on Comparative Effects of Microfinance Systems

Source: Author's Construct, 2019

2.10 Chapter Summary

The Ghanaian financial sector is broadly categorised into three namely; formal (commercial and rural banks), semi-formal (credit unions) and informal (susu groups and money lenders) credit markets. While the formal and semi-formal credit markets are regulated, the informal sector is unregulated. Microfinance institutions provide products and services such as savings, loans and enterprise development services to their clients. A combination of Socio-demographic factors, household's economic factors, communication factors, and supply side factors influence the demand for microfinance. Microfinance impacts on households in the creation of employment, smoothing of household consumption, education of children, accumulation of household assets, and enterprise development. Findings on the impact of microfinance these areas are however mixed.

2.11 Contribution to Knowledge

By conducting a comparative analysis of the three major microfinance systems, this study has contributed to knowledge since it has moved from previous impact analysis of microfinance which concentrated on comparison between treated and untreated groups (beneficiaries and non- beneficiaries) to a comparison of groups that have been treated but under different microfinance systems and hence, has revealed that the formal microfinance system has the most impact on beneficiaries through its impact on income.. Again, previous studies concentrated on individual microfinance institutions whereas this study involves the three major microfinance systems and the relative impacts of these systems on beneficiary households.

Also, this study has contributed to knowledge by revealing, describing and documenting the various indigenous support systems in the Upper West Region which are largely undocumented.

CHAPTER THREE

PROFILE OF THE STUDY AREA AND METHODOLOGY

3.1 Description of Upper West Region

The Upper West Region, with Wa as the regional capital, was formerly part of the then Upper Region which was itself carved out of the Northern Region in July 1960. In pursuance of the decentralisation policy, the Government in 1983 divided the Upper Region into Upper East and Upper West. The Upper West Region covers a geographical area of approximately 18,478 square kilometers. This constitutes about 12.7 per cent of the total land area of Ghana. The region is bordered on the North by the Republic of Burkina Faso, on the East by Upper East Region, on the South by Northern Region and on the West by Cote d'Ivoire.

In terms of vegetation, the region is located in the guinea savannah vegetation belt. The vegetation consists of grass with scattered drought-resistant trees such as the shea, the baobab, dawadawa, and neem trees. The heterogeneous collection of trees provides all domestic requirements for fuelwood and charcoal, construction of houses, cattle kraals and fencing of gardens. The shorter shrubs and grass provide fodder for livestock.

The climate of the region is one that is common to the three northern regions. There are two seasons, the dry and the wet seasons. The wet season commences from early April and ends in October. The dry season, characterised by the cold and hazy harmattan weather, starts from early November and ends in the latter part of March when the hot weather begins, with intensity and ends only with the onset of the early rainfall in April. The temperature of the region is between

a low of 15^{0}C at night time during the harmattan season and a high of 40^{0}C in the day during the hot season.

The region has 11 administrative districts and a Municipality namely, Nadowli, Daffiama-Busie-Issa, Jirapa, Lambussie-Kaane, Lawra, Nandom, Wa West, Wa East, Sissala West, Sissala East District and Wa municipal as illustrated in figure 3.1.

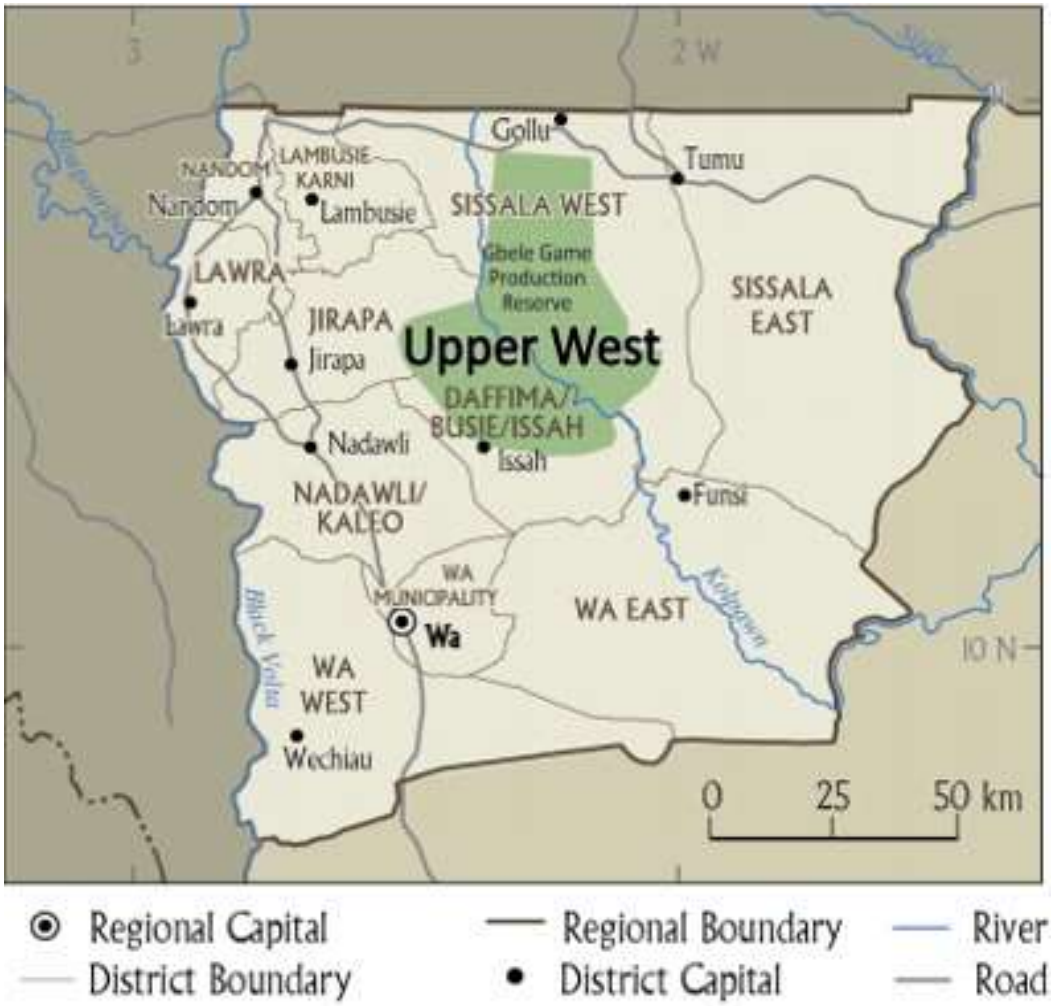

Figure 3. 1: Map of Upper West Region. Produced by the Cartographic Section, Department of Geography, Western University, 2015.

The major ethnic groups in the region fall under the broad generic categories of the Mole Dagbon (75.7%) and Grusi (18.4%). The major languages of the region

are Dagaare, Sissali, Wale, and Lobi. There are three major religious groupings in the region, Christianity (35.5%), Islam (32.2%) and Traditional religion (29.3%). Festivals such as Kobine, Kakube, Zumbeti, Willa, Dumba, Paragbiele, Bagre, Kala, Bongngo and Singma portray the way of life of the people of the region. Culture is not only observed through the celebration of festivals but can be seen also in handicrafts. In the Upper West Region, the people are engaged in spinning, weaving and smock designing. They produce very beautiful musical instruments like the xylophone and engage in pottery, blacksmithing, and carving.

The Upper West Region is the least populous region of Ghana with 702,110 persons constituting 2.8 percent of the total population of the country. In terms of annual average intercensal growth rate, the region has the second lowest growth rate of 1.9% after the Upper East with a rate of 1.2%. Out of a population size of 702,110, 341,182 (48.6%) are males and 360,928 (51.4%), females. The region's population is predominantly rural (83.7%). The dependent population is 47.7 percent. The region's population forms 2.8 percent of the total population of the country, while the sex ratio is 94.5 males to 100 females. The region's population indicates an increase of 17.5 percent over the 2000 population census figure of 576,583 and translates into an intercensal growth rate of 1.9 percent. The region's population density of about 38 persons per square kilometre may appear low, but there is a large concentration along the western corridor (Lawra, Jirapa and Nadawli areas) where the density is higher than 97 persons per square kilometre (GSS, 2012).

The population of the region has the following distribution by districts: Wa West, 81,348 with 40,227 males and 41,121 females, Wa Municipal with a population of 107,214 comprising 52,996 males and 54,218 females , Wa East 72,074 with 36,396 males and 35,678 females, Sissala East 56,528 with 27,503 males and 29,025 females, Nadowli and Daffiama-Bussie-Issa 94,388 with males 44,724 and 49,664 females, Jirapa 88,402 with 41,592 males and 46,810 females, Sissala West 49,573 with 24,151 males and 25,422 females, Lambussie Karni 51,654 with 24,952 males and 26,702 females, and Lawra and Nandom 100,929 with 48,641 males and 52,288 females. The main economic activity of the people of the region is peasant farming. This is supported by the fact that 72.2 percent of the economically active group are engaged in agriculture or related activities. The hard-working farmers of the region cultivate maize, guinea corn, millet, yam, rice, soya beans and cotton in addition to the rearing of cattle in large numbers. There are 110,175 households in the region, which is about 2 percent of the total households in the country. With a population of 702, 7110, this gives an average household size of 6.4 persons. The total number of houses in the region is 82,293. This gives a percentage increase of housing stock of 58.6 over the 2000 population census (GSS, 2012).

The region has financial institutions that engage in the provision of loans for various categories of people and the mobilisation of savings. These financial institutions include the Ghana Commercial Bank, Barclays Bank, Stanbic bank, First National Bank, Agricultural Development Bank, National Investment Bank and the Apex Bank. There are a number of microfinance institutions operating in the region with the aim of providing various microfinance services to the people. The ultimate goal of the institutions is to help in poverty reduction in the

region. The first co-operative credit union in Ghana was started in Jirapa in the Upper West Region, from where the movement spread to other parts of the country and neighbouring countries (Gheneti, 2007). The region has four rural banks (Sonzale Rural Bank, Nandom Rural Bank, Sissala Rural Bank, Lawra Rural Bank) and some functioning Credit Unions (Sissala Credit Union, Wa co-operative Credit Union, Jirapa Credit Union, Daffiama Community credit union). There are also a number of NGOs (Plan Ghana, Action Aid Ghana, Sinapi Aba) that provide microfinance services in the region.

3.1.1 Description of Wa Municipality

The Wa Municipal Assembly was created out of the then Wa District in 2004 with legislative instrument (L1) 1800 in pursuant of the policy of decentralization that started in 1988. The Wa Municipality shares administrative boundaries with Nadowli District to the north, Wa East District to the east and south and Wa West District to the west. It lies within latitudes 1º40'N to 2º45'N and longitudes 9º32'W to 10º20'W. It has an area of approximately 234.74 km^2, which is about 6.4% of the total land area of the Upper West Region.

The Municipality lies in the Savannah high plains, which generally, is gently undulating with an average height between 160m and 300m above sea level. The gentle rolling nature of the landscape implies that the topography is no barrier to agriculture and other physical development (Wa Municipal Assembly, 2010).

Total population of the municipality stands at 107,214. This comprises 52,996 males and 54,218 females representing 49.4% and 50.6% respectively and the

sex ratio is 97.7 males to 100 females. The population density of the municipality is 5 persons per square kilometre (GSS, 2012).

The Municipality has the Ghana Commercial Bank, Barclays Bank, Stanbic Bank, First National Bank, Agricultural Development Bank, National Investment Bank and the Apex Bank as formal financial institutions. The Municipality has the Sonzale Rural Bank and Nandom Rural Bank that also provide financial services including microfinance to the public. The Wa Co-operative Credit Union and Snapi Aba are the main semi-formal financial institutions in the Municipality. The widely known indigenous microfinance systems in the Municipality are the "Susu" and Moneylender system.

3.1.2 Description of Lawra District

The Lawra District is located in the north western part of the Upper West Region, between longitudes 2° 25" W and 2°45"W and latitudes 10°20" N and 11°00"N. It is bounded to the east and south by the Jirapa/Lambussie-Karnie District and to the North and West by the Republic of Burkina Faso. Lawra is one of the eight (now eleven) districts that make up the Upper West Region. The total area of the district is 1,051.2 square km. This constitutes about 5.7% of the region's total land area, which is estimated at 18,476 square km (Lawra District Assembly, 2010).

The topography of the district is gently rolling with a few hills ranging between 180 and 300 metres above sea level. It is drained by one main river — the Black Volta, to the west, marking the boundary between the district and the Republic of Burkina Faso. The rock formation in the district is essentially Birimian, rich in minerals and dotted with outcrops of granite as the predominant mineral. The

district mineral potential is largely unexplored. Some reconnaissance work indicates the presence of minor occurrences of manganese, traces of gold and diamond, iron ore and clay. The Black Volta has several feeder tributaries; notable amongst which are Kamba Korpieli, Kopara, Gberi, and Kokoligu-baa. These rivers present opportunities for irrigation in the district that can promote farming all year round (Ibid).

The soils in the district are characterised by mostly laterites. These are developed from the Birimian and granite rocks which underlie the area. There are also strips of alluvial soils along the floodplains of the Black Volta as well as sandy loams along some of its tributaries. The general nature of the soils, coupled with the traditional land use practices and limited rainfall, tend to have an adverse effect on crop production. This forces the youth to look for sustenance elsewhere at the expense of their lives or health.

The district lies within the Guinea Savannah Zone which is characterised by short grasses and few woody plants. Common trees in the District consist of drought and fire-resistant trees such as baobab, dawadawa, shea trees and acacia. The vegetation is very congenial for livestock production, which contributes significantly to household incomes in the District. The climate of the district is a tropical continental type with the mean annual temperature ranging between 27°C to 36°C. The period between February and April is the hottest. Between April and October, the Tropical Maritime air mass blows over the area which gives the only wet season in the year. The rainfall pattern leads to the migration of the youth, a factor associated with the underdevelopment of the human resource base of the district. (Lawra District Assembly, 2010).

The 2010 National Population and Housing census results put the District's population at 100,929. This is about 14.4% of the Region's total population of 702,110. This comprises 48,641 males and 52,288 females representing 48.2% and 51.8% respectively and the sex ratio is 93.1 males to 100 females and the population density is 95.4 persons per sq km (GSS, 2012). The financial sector of the district is made up of four financial institutions namely: The Ghana Commercial Bank, Nandom Rural Bank and the Lawra Area Rural Bank.

3.1.3 Description of Sissala East District

The Sissala East District is located in the north-eastern part of the Upper West Region of Ghana. It falls between longitude 1.30° to 2.40º W and latitude 10.00° to 11.00° N. The district has a total land size of 4,744 square kilometres, representing 26 percent of the total landmass of the region. It shares boundary on the north with Burkina Faso, on the east with Kassena Nankana and Builsa Districts in the Upper East Region, and to the south-east with West Mamprusi District, in the North-East Region. Its neighbours in the Upper West Region are Wa East, Nadowli, Sissala West and Jirapa Lambussie Districts to the west. The district, due to its position, has an advantage for trade and other cross-border activities. This locational advantage is a potential for the development of the local economy (Sissala East District Assembly, 2010).

The topography of the district is gently undulating and generally characterised by altitudes of between 330 m and 365 m in the northern part descending to 220 m and 290 m in the Sissili River valley. The district is mainly drained by the Sissili River and its tributaries flowing in the south-eastern direction to join the White Volta. The numerous tributaries of the Sissili River provide an advantage

for the construction of more dams in addition to the already existing ones which can help reduce poverty in the district through dry season farming. With a gently undulating topography, the district is bound with fresh granitic and bromine rock outcrop which gives the district a whale-back landscape appearance. These granitic and bromine rocks weather fast to form soils of lesser depths that are rich in minerals for potential farming. The types of soil in the district include savannah ochrosols, tropical brown, and terrace or alluvial soils. These soils are better suited for the cultivation of cereals and root tuber crops, including millet, maize, sorghum, yam and a cash crop like cotton. They respond well to the application of organic manure and commercial fertilizers to give high yield and could help in poverty reduction in the district (Ibid).

Sissala East District is located in the Guinea Savannah vegetation belt. The vegetation consists of grasses with scattered fire-resistant trees such as the shea nut, the baobab, and dawadawa trees. Acacia is also a common tree of this vegetation belt. The heterogeneous collections of these trees meet domestic requirements for firewood and charcoal, construction of houses, cattle kraals and fencing of gardens. The shorter shrubs and grasses provide fodder for livestock. The shea nut tree is one of the great economic assets of the district (Sissala East District Assembly, 2010).

The climate of the Sissala East District is tropical continental as experienced in the northern regions of Ghana. Throughout the year, temperatures are high with a minimum of 23ºC at night and a maximum of 42ºC during the day and this favours plant growth. The rainfall type which is conventional in nature is characterised by a single rainy season from May to September/October. As a

result of the single maximum rainfall prevailing in the district, crop production is mostly done during the rainy season (May to September/October). However, since farming is the major occupation of the people, it means that their major sources of livelihood and income are limited during the dry season, apparently resulting in the migration of the youth to the south in search of greener pastures. There is thus, the need to have adequate irrigation facilities to promote and enhance agricultural activities in the dry season. In addition, it is imperative to identify and provide an alternative source of livelihood to the people to complement their occupation and improve their income generating capacity (Ibid).

The population of the Sissala East District is estimated at 56,528. This is about 8.1% of the Region's total population of 702,110. In terms of sex distribution, the population of the district comprises 27,503 males and 29,025 females representing 48.7% and 51.3% respectively. The sex ratio of the population is 94.8 males to 100 females and the population density is 12 persons per square killometre (GSS, 2012).

The composition of the district's economy is characteristic of the Ghanaian economy. It has larger agricultural sector- seventy-six percent (76%), service and commerce- fifteen percent (15%), and the industrial sector- nine percent (9%). The Sissala East District is basically rural with more than 80 percent of the people living in rural settlements and is engaged in farming. The district economy is mainly agrarian. This makes agricultural related activities the predominant activity employing a greater proportion of the population. The people practice subsistence farming with only a few engaged in commercial

cotton farming. The main crops are cereals such as millet, maize, sorghum, and rice. The rest are groundnut, cowpea, yam, and cotton (Ibid).

The Sissila East District has between 35 percent and 40 percent of its population constituting the active labour force. A greater proportion of this population is engaged in agricultural production and its related activities. The 2010 Population and Housing Census showed that 76 percent of the population of the Sissala East District are engaged in agricultural production such as the cultivation of cereals, tubers, and vegetables for home consumption and some surplus for the market. Cash crops such as shea nut and dawadawa also contribute greatly to income generation. Livestock rearing also plays a key role in the agricultural development in the district since many families produce them for both home consumption and the market. The manufacturing and processing sector is fast gaining grounds in the district by employing about 12 percent of the workforce. The industrial activities in the district include shea butter processing, groundnut oil extraction, weaving and dressmaking, pottery and basket weaving, blacksmithing, pito brewing, carpentry, masonry and vehicle repairs (GSS, 2012).

The commerce and distributive trading sector employ 10 percent of the workforce while the remaining 5 percent are engaged in sectors such as finance, social services, construction, restaurants/hotels, and transport operation. There are four (4) financial institutions in the Sissila East district. These are the Ghana Commercial Bank, Sissila East Rural Bank, the Agricultural Development Bank and the Sissala Co-operative Credit Union.

3.2 Research Methodology

3.2.1 Research Design

The research employed the quasi-experimental design and hence, does not involve assigning participants to treatment and control groups randomly. The study compared the outcomes for individuals receiving benefits from indigenous microfinance systems with the outcomes of beneficiaries of formal and semi-formal microfinance systems. The beneficiaries of formal and semi-formal microfinance systems served as the treatment groups whiles the beneficiaries of the indigenous system served as the control group for this comparative study. This is meant to find out the impact of formal and semi-formal microfinance systems relative to the indigenous microfinance system in the study area. Thus, three categories of households were studied; households which have at least one of their members benefiting from indigenous microfinance (control group), households which have at least one of their members benefiting from formal microfinance system and households which have at least one of their members benefiting from semi-formal microfinance system (experimental groups).

3.2.2 Sampling Approach/Procedure

The study employed a multistage sampling procedure to draw a representative sample. The multistage sampling procedure consisted of three-stages. The three-stages involved the selection of the districts and municipality, selection of the microfinance institution and selection of beneficiaries of the various systems.

The Upper West Region was chosen as the study area because of its high poverty status. In the First stage, the Sissala East District, Wa Municipal, and the Lawra District were selected through simple random sampling out of the eight districts

and one municipality in the region. The choice of this sampling technique was meant to give equal chances of being included in the study to these districts and municipality. These districts and municipality were selected before the creation of two additional districts in 2012. In the second stage, Nandom Rural Bank, Sissala Rural Bank and the Wa branch of the Nandom Rural Bank, Wa Co-operative Credit Union and Sissala East Co-operative Credit Union, Susu associations were used as formal, semi-formal and indigenous microfinance institutions respectively. The rationale for the use of these institutions is based on the fact that they are the predominant microfinance systems in the selected districts and municipality. In the third and final stage, simple random sampling was employed to select beneficiaries of the selected microfinance systems. Since beneficiaries of formal, semi-formal and indigenous microfinance systems are the target population, the simple random sampling technique was then applied in three fashions: to the beneficiaries of the formal system, to the beneficiaries of semi-formal, and to the beneficiaries of the indigenous system. In undertaking the simple random sampling, numbers were assigned to members of each of the microfinance system, these numbers were placed in a box and well mixed after which 120 numbers were picked without replacement for each of the three microfinance systems. The application of the simple random sampling to the beneficiaries was relatively simple since a detailed list of these beneficiaries was obtained at the various institutions. This technique of sampling made it possible to give equal opportunity to the beneficiaries of these microfinance systems. The sampling frame from which the sampling was done is presented in table 3.1.

Table 3. 1: Sampling Frame

TYPE OF MICROFINANCE SYSTEM	TOTAL NUMBER OF QUALIFIED BENEFICIARIES	NUMBER SAMPLED
Formal	1550	120
Semiformal	1350	120
Indigenous	1600	120
Totals	4500	360

3.2.2.1. Sample Size Determination

There are various formulas for determining the required sample size for a study depending on the type of data available, thus, whether it is categorical or quantitative. This study adopts the formula used by Krejcie & Morgan (1970) which is given as:

$$n = \frac{X^2 * N * P * (1-P)}{E^2 * (N-1) + (X^2 * P(1-P)} \quad (1)$$

Where n is required sample size, N is total population of the beneficiaries from the three microfinance systems (approximately 4500), X^2 is table value of chi-square for 1 degree of freedom at the desired confidence level. But confidence level of 95% with 1 degree of freedom = 3.84 from the chi-square table, P is the population proportion (0.50 used in this study since it can provide a maximum sample size), and E^2 is the margin of error or the degree of accuracy expressed as a proportion (in this study the default of 0.05 or 5% is used).

$$\Rightarrow n = \frac{3.84^2 * 4500 * 0.5 * (1-0.5)}{0.05^2 * (4500-1) + (3.84^2 * 0.5(1-0.5)} = 353$$

Based on this, data was collected from 360 beneficiary households comprising 120 beneficiaries drawn from each of the three microfinance systems. Beneficiaries of the indigenous microfinance system were used as the control group or base category. It is important to note that the population of 4,500

beneficiaries comprises of beneficiaries who have been with their respective microfinance system for at least four years. This is because the study is an impact analysis which requires that the period of an intervention be long enough for impact to be realised.

3.2.3 Sources and Techniques of Data Collection

This study largely made use of primary data. Respondents were selected from clients or beneficiaries of indigenous, formal and semi-formal microfinance systems in the Upper West Region of Ghana. The use of these three groups was to make possible a comparative analysis of the three major microfinance systems operating in the region.

A household survey was conducted to collect data from beneficiary households of the three microfinance systems using semi-structured questionnaire. A checklist was used for conducting focused group discussions with group leaders and some opinion leaders. The semi-structured questionnaire was designed to collect data on the socio-economic and demographic characteristics of respondents and data from microfinance providers on their activities and relationship between the formal and indigenous microfinance systems. The types and operations of the indigenous microfinance or support systems were identified through focused group discussions. Focus group discussion was used because it is a qualitative approach that can help me gain an in depth understanding of social issues in the area of the indigenous support systems prevailing in the study area. The aim of using this method was to enable me obtain data from a purposively selected group of individuals rather than from a statistically representative sample of a broader population. In this regard, local

and elderly opinion leaders were selected and put into groups of ten (10) participants in each of the three selected municipality and districts.

3.2.4 Methods of Data Analysis

To achieve the analysis of the specific objectives of the study, the following methods were used to analyse the data in accordance with the specific objectives.

3.2.4.1 Types of Indigenous Microfinance and Support Systems in the Upper West Region

Under this objective result are presented with the aid of tables and the 'narrative approach' used to narrate the various microfinance and support systems prevailing in the study area using information gathered from the respondents. This method was seen as appropriate since the data is qualitative in nature.

3.2.4.2 Influence of Indigenous Microfinance Institutions on Formal and Semi-Formal Institutions

Descriptive statistics was used to analyse this objective. Specifically, frequency distribution tables were used to present the data from respondents of formal and semi-formal microfinance institutions. The data were basically on how the operations of their respective microfinance institutions are influenced by indigenous microfinance systems. The choice of this technique is informed by the qualitative nature of the data.

3.2.4.3 Determinants of the amount of loan received by beneficiaries

For the analysis of this objective, log-log model was used. Thus, both the dependent and independent variables are transformed by the ''natural'' logarithm (ln). The log-log model was used because it is handy when the

relationship is nonlinear in parameters and the fact that the log transformation generates the desired linearity in parameters which is one of the OLS assumptions. Furthermore, the natural log makes interpretation of the regression coefficients straightforward. The parameters are the elasticities of y (the dependent variable) with respect to x (the independent variables).

Theoretically, the model is specified as:

$$\ln(Y_i) = \beta_0 + \beta_1 \ln(X_i) + \beta_2 \ln(X_2) + \beta_3 \ln(X_3) + \cdots \beta_k \ln(X_k) + \mu_i \quad (2)$$

Where, Y_i is amount of loan received by beneficiaries, ln denotes the 'natural' logarithm, $X_i \ldots, X_k$ are factors hypothesised to influence the amount of loan received (such as age, gender, household size, years spent in school), $\beta_0 \ldots, \beta_k$ are the parameters to be estimated and μ_i is the random term. The random term caters for unobservable factors that might influence the amount of loan received. Thus, the random term represents all factors, other than $X_i \ldots, X_k$, which might influence the amount of loan received by beneficiaries but was not included in the equation.

On the basis of the theoretical specification in eq. (2), the empirical model to be estimated is specified as:

$$\ln(LAMT_i) = \beta_0 + \beta_1 \ln(AGE) + \beta_2 \ln(DIST) + \beta_3 \ln(HHINC) + \beta_4 \ln(Belong) + \beta_5(GEN) + \beta_6 \ln(HSIZE) + \beta_7(DR) + \beta_8 \ln(Years\ edu) + \beta_9(Group\ loan) + \beta_{10} \ln(number) + \beta_{11}(MFINFO) + \beta_{12} \ln(EXP) + \beta_{13} \ln(IR) + \beta_{14} \ln(REPP) + \mu_i \quad (3)$$

The definition of the variables and their respective units of measurement are shown in Table 3.1. Four different models are estimated using eq. (3). The first is an overall model that combines all the three microfinance systems and the other three are with respect to the microfinance systems (formal, semi-formal and indigenous). These last three models are to provide the basis for a comparative analysis of the systems.

3.2.4.4 Determinants of choice of microfinance institution type

Empirical studies have demonstrated using various quantitative models in modelling why a person will choose an alternative out of several alternatives. Thus, why a person will either choose to access credit from the formal system, from the semi-formal system or from the indigenous system. The choice of a particular method for analysis is largely influenced by the econometric properties of the variable of interest such as the distribution of the dependent variable. Models often used in similar studies include binary regression, selection models and those with multinomial distributions [eg Multinomial logit, Multinomial Probit and Conditional logit (Cameron & Trivedi, 2005)].

Other studies focus their attention on the relative importance of demand for microcredit by sources. These studies, therefore, group sources of credit into mutually exclusive categories which yields a multinomial distribution of the variable of interest. Many empirical studies under this situation adopt the multinomial logit given that its likelihood function is easy to compute. Rahji & Fakkayode (2009) for instance, observe household demand for credit as a sequential process. The first step is to decide whether to apply or not; the second step is the bank to accept or reject the application and the third is to give full

credit applied for or not. They, therefore, grouped households into mutual categories as credit constraint (applications rationed), applications rejected and credit non-constraint (applications approved). This categorization permits them to adopt multinomial logit. In their multinomial logit analysis, Okurut et al. (2005) grouped respondents into three mutual categories. They used those not borrowing at all as a reference group against those borrowing from the banks and those from informal lenders. Mpuga (2010) expands these into six categories. He uses individuals with zero demand against other sources such as bank, NGO/Cooperative society, government agency, moneylender, relative/friends and community group. Balogun & Yusuf (2011) adopt the same method of grouping for their multinomial logit analysis. Togba (2012) fit a regression model with the dependent variable as sources of borrowing. He identifies eight (8) different sources of borrowing and regrouped them into broad categories as banks, formal microfinance institutions, and informal institutions. This permitted the convenient application of the multinomial logit model in his study.

Following from the previous studies as mentioned above, this study grouped the choices of microfinance institutions available to beneficiaries in the study area into three categories namely, indigenous, formal and semi-formal microfinance systems.

However, in the case of this study, the multinomial logit results did not meet the Independence of Irrelevant Alternatives (IIA) assumption given the data obtained for the study. In view of this, the multinomial probit model which is an

alternative to the logit model but not affected by this assumption, and also noted for its simplicity and wide application, has been adopted.

Available literature (e.g Cameron & Trivedi, 2005; Green, 2003) offer quantitative explanation to the behaviour of the consumer in making a rational choice to maximise satisfaction based on the theory of utility. A rational household chooses one alternative among many decisions that yield maximum utility. The decision under this is choice of microfinance institution that provides microfinance services to households. The decisions are unordered and are therefore motivated by the random utility model. This is the case where the i^{th} consumer faces J number of choices. This is illustrated as follows:

$$U_{ij} = Z_{ij}\beta + \varepsilon_{ij} \quad (4)$$

Given that U_{ij} yields the maximum utility to the consumer, the probability model for the choice is:

$$Prob(U_{ij} > U_{ik})\ for\ k \neq j \quad (5)$$

The utility obtained can be decomposed into observed and unobserved components expressed as:

$$U_{ij}(X_{ij}; Z_{ij}) = V_j(X_{ij}; \beta) + \varepsilon \quad (6)$$

Where $U_{ij}(X_{ij}; Z_{ij})$ is the utility of the i^{th} individual choosing alternative j, $V_j(X_{ij}; \beta)$ is the deterministic component of the utility and ε is the error term. Following from Green (2003), the conditional probability of the Multinomial probit is specified as:

$$prob(Y_i = \mathrm{j}|X_i) = \frac{\exp(\beta_j' X_i)}{1+\sum_{k=1}^{J}\exp(\beta_k' X_i)} \quad (7)$$

Where j = 0,1,2 and $\beta_1 = 0$

The base category (which is the indigenous microfinance source) is used to compare other choices by restricting the parameters of the base category to zero. The other microfinance sources are the semi-formal and formal. This is because J parameter vector is required to estimate J+ 1 probabilities.

The J log-odd ratios are computed with the relation:

$$ln\left[\frac{P_{ij}}{P_{ik}}\right] = X_i(\beta_i - \beta_k) = X_i'\beta_j \quad (8)$$

Based on equation 8, the empirical model to be estimated is specified as:

$$prob(Y_{ij} = j|X_i) = \beta_0 + \beta_1 GEN + \beta_2 AGE + \beta_3 HSIZE + \beta_4 DR + \beta_5 NCHLD + \beta_6 EDU + \beta_7 EXP + \beta_8 Interest + \beta_9 POCC + \beta_{10} COLTRAL + \beta_{11} ASET + \beta_{12} LIVEHD + \beta_{13} Number + \beta_{14} REPP + \beta_{15} DIST + \beta_{16} MFINFO + \beta_{17} LAMT + \beta_{18} Employed + \beta_{19} HHINC + \beta_{20} No_{chi}\sim n + \beta_{21} Income\sim d + \beta_{22} Income\sim 1 + \mu_i \quad (9)$$

Estimation of the multinomial Probit is most often by maximum likelihood method. The log-likelihood function:

$$lnP = \sum_{i=1}^{n}\sum_{j=0}^{J} d_{ij}\, lnProb(Y_i = j) \quad (10)$$

The dummy variable d_{ij} takes the value of 1 if an i^{th} individual has chosen alternative j and 0 otherwise.

Taking the first order derivative of equation (9) yields:

$$\frac{\partial lnP}{\partial \beta_j} = \sum_{i=1}^{n}(d_{ij} - P_{ij}) \quad (11)$$

The marginal effect is specified as:

$$\partial_j = \frac{\partial P_j}{\partial X_i} = P_j[\beta_j - \bar{\beta}] \quad (12)$$

This implies that a unit change in X_i will change the probability of demand for a j^{th} source of microfinance system by $P_j[\beta_j - \bar{\beta}]$.

The use of the multinomial probit model for the analysis of the determinants of choice of credit source of beneficiaries is informed by the fact that the dependent variables are discrete in nature, represent the choices of beneficiaries of the three microfinance systems and because of its wide application due to the fact that unlike the logit model, it does not suffer from the assumption of Independence of Irrelevant Alternatives.

Table 3. 2: Variable definition and units of measurement

Variable	Definition	Unit of measurement
GEN	Gender	Dummy (1 = if male; 0 = otherwise)
AGE	Respondent's age	Years
HSIZE	Household size	Number of people
DR	Dependency Ratio	Ratio of dependents to economically active members
POCC	Beneficiary primary occupation	Dummy (1 = If arable crop farming; 0 = otherwise)
Years edu	Years spent at School	Years
EXP	Experience in Borrowing	Years
COLTRAL	Collateral	Dummy (1 = if required; 0 = otherwise)
Number	Group size	Number of people
REPP	Repayment period of current loan	Number of weeks
IR	Interest Rate	Percentages
MFINFO	Access to microfinance information	Dummy (1 = If yes; 0 = otherwise)
ASET	Asset Value	Ghana Cedis (GHS)
LIVEHD	Other Livelihood	Dummy (1 = If yes; 0 = otherwise)
LAMT	Amount of current loan	Ghana Cedis (GHS)
DIST	Distance to Credit Institution	Kilometre
Employed	Number employed	Number of people in the household
NCHLD	Number of Children in School	Number of People
No_chi~n	Number of children of school going age	Number of children
Income-1	Income of household head	Ghana Cedis (GHS)
Income-2	Income of primary beneficiary	Ghana Cedis (GHS)
HHINC	Estimated household income	Ghana Cedis (GHS)

Source: Field Survey, 2018

3.2.4.5 Impact of Microfinance on Households Income and Assets

Impact studies have been analysed using different methods. For example, Ayaz & Hussain (2011) adopted the stochastic frontier production function to assess the impact of credit on the production efficiency of farmers. In their Cobb-

Douglas functional form, credit variable was added to the inefficiency parameters. Anyanwu (2011) in his study on the impact of migrant remittances on income inequality in African countries, used a similar method. Nimoh et al. (2011) relied on inferential statistics using the chi-square test of independence to find whether formal credit has an effect on the performance of poultry farmers. Other researchers use qualitative methods to achieve reliable results in their impact studies. The impact of microfinance programmes has been assessed by Adams & Bartholomew (2010) with the use of interviews while Javed et al. (2006) adopted a Likert scale.

Wainaina, Okello, & Nzuma, (2012) indicate that the Propensity score matching is a widely used type of matching when dealing with treated and untreated individuals. It uses information from respondents that do not participate in an intervention to identify what would have happened to participants in the absence of intervention. Here, individual beneficiaries from microfinance system are considered treated while those without access are the untreated or control group.

PSM addresses bias by assuming conditional independence, which basically states that being part of microfinance institutions and income of the beneficiary, the income of the household and the value of household assets are independent. The main aim of the PSM is the estimation of the average treatment effect on the treated (ATT), which measures the difference between the income of beneficiaries, household income and value of the household asset and what would have been their income and value of the asset if they were non-participants.

This is stated as;

$$ATT_{ij} = E(P_{1ij}|D_{ij} = 1) - E(P_{0ij}|D_{ij} = 1) \quad (13)$$

Where $P_{1ij,}$ represents, for example, the income of a beneficiary who is a participant of a microfinance and P_{0ij} is what the income would have been if he/she had not been a participant in the microfinance institution. The parameter $E(P_{0i}|D_{ij} = 1)$ represents the counterfactual, which is impossible to measure but the income of a person who does not participate in the microfinance system, $E(P_{0i}|D_{ij} = 0)$, can be measured and used to represent the counterfactual. But this might lead to biased estimates since there could be the pre-treatment difference between beneficiaries and non- beneficiaries.

The PSM overcomes the counterfactual problem by summarizing the effect of observed predictors (X) into a single estimate, called the propensity score and stated as:

$$P(X_{ij}) = P_r[D_{ij} = 1|X_{ij}] = E[D_{ij}|X_{ij}] \quad (14)$$

Probit or logit can be used in estimating the propensity scores since the treatment is binary. Logit is used in this study as there exists no difference between using logit or probit as argued by Heinrich, Maffioli, & Vazquez (2010).

The next step is a selection of matching algorithm that will use the scores to match beneficiaries and non- beneficiaries so as to minimise the level of bias between the groups that might exist. The popular and the most widely used algorithms are nearest neighbour matching (NNM), radius matching (RM), kernel matching (KM), Caliper matching and Local-linear matching.

But the algorithm to use is subject to the researcher since there is no rule selecting an algorithm to use (Issahaku, et. al. 2018). This study uses the nearest neighbour and the kernel methods. The next step is to estimate the effects of microfinance on the income of beneficiaries.

The following would be estimated:

$$ATT_{ij} = E[E\{P_{1ij}|D_{ij} = 1, P(X_{ij})\} - E\{P_{0ij}|D_{ij} = 0, P(X_{ij})\}|D_{ij} = 1] \quad (15)$$

$$ATE_{ij} = E[E\{P_{1ij}|D_{ij} = 1, P(X_{ij})\} - E\{P_{0ij}|D_{ij} = 0, P(X_{ij})\}] \quad (16)$$

Where ATT is the average treatment effect on the treated (which measures the effect of microfinance on the income among beneficiaries) and ATE is the average treatment effect (which measures the effect of microfinance on the income of both beneficiaries and non-beneficiaries). In addition, equations (15) and (16) are also being estimated using the teffects in order to check the robustness of results.

Rosenbaum bounds (rbounds) test is used on the PSM based estimates to know the impact of hidden biases. The rbounds does not point out biases or the magnitude of biases but asks whether the treatment effects may be altered by factors not observed in the dataset.

The PSM was therefore adopted to operationalise the objective of estimating the impact of microfinance services because of wide applicability in the estimation of impacts.

3.3 Limitations of the research

This research is limited to binomial impact assessment and does not cover multinomial impact assessment. Thus, there is the need for future research into the impact of microfinance on households to be extended to multinomial treatment effects and multinomial propensity score matching. Also, the sample size of the control group is the same as that of the treatment group. However, for analysis involving propensity score matching, the sample size of the control group should be larger than that of the treatment group.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Demographic and Socioeconomic Characteristics of Beneficiaries

4.1.1 Age distribution of beneficiaries

The ages of beneficiaries range between 20 to 70 years as shown in Table 4.1. Out of the 360 beneficiaries, 95 representing 26.39% were between 20-35 years, 160 beneficiaries representing 44.44% were between 36-50 years, 98 beneficiaries representing 27.22% were between 51-65 years and the rest of them representing 1.94% were 65 years and above. The average age of beneficiaries is approximately 44.03 years. The average age of the beneficiaries (44.03 years) implies that beneficiaries of microfinance systems in the region can be described as relatively young and within the economically active population. The mean age of beneficiaries of the formal, semi-formal and indigenous microfinance systems are 44.63, 44.63 and 43.18 respectively as indicated in Table 4.2. It can therefore be concluded that there is no significant difference in ages of beneficiaries of the three microfinance systems. The youthful nature of beneficiaries of these microfinance institutions implies that loans assessed, can be put to very economical uses since the beneficiaries are in the economically active age group and can engage in very productive ventures with these loans. This may result in high loan repayment rate and hence, make the microfinance institutions more viable.

4.1.2 Gender distribution of beneficiaries

The study revealed that majority of the beneficiaries representing 61.67% were females with only 38.33% being males. It can also be observed from Table 4.1 that in all the three microfinance systems, female beneficiaries dominate. Specifically, 69.17% of beneficiaries are females and 30.83% of them are male, 58% of the beneficiaries are females whiles 41.67% are males and 57.50% of sampled beneficiaries are females as against 42.50% males under the formal, semi-formal and indigenous microfinance systems respectively. The predominance of females among beneficiaries of these microfinance institutions may imply that households' welfare can be enhanced since women are more likely to complement their husbands in the provision of the needs of their households. According to Vaessen, Rivas, Duvendack, Jones, Leeuw, Van Gils, & Waddington, (2014), by providing credit to poor women, their direct control over expenditures within the household increases, with subsequent implications for the status and well-being of women and other household members.

Table 4. 1: Socio-demographic characteristics of beneficiaries

Variables	Frequency	Percent	Mean	Min	Max
Age			44.02	20	70
20-35	95	26.39			
36-50	160	44.44			
51-65	98	27.22			
65+	7	1.94			
Gender					
Male	138	38.33			
Female	222	61.67			
Marital status					
Married	295	81.94			
Otherwise	65	18.06			
Household size			5.47	2	15
1-5	194	53.89			
6-10	158	43.89			
11+	8	2.22			
Educational level					
No education	229	63.61			
Adult literacy	11	3.06			
Primary	25	6.94			
JHS	36	10.00			
Form four leavers	12	3.33			
SHS	20	5.56			
Vocational/technical	15	4.17			
Tertiary	12	3.33			
Religious Status					
Christians	121	33.61		-	
Muslims	229	63.61			
Traditionalist	10	2.78			
Amount of loan					
50-500	178	49.45			
501-1000	85	23.61			
1001-2000	52	14.44	1160.40	50	10000
2000-5000	35	9.72			
5000+	10	2.78			

Source: Field Survey, 2018

Table 4. 2: Socio-demographic characteristics of beneficiaries by type of system

Variable	Formal		Semi-formal		Indigenous	
	Freq.	%	Freq.	%	Freq.	%
Age:	(44.63)		(44.63)		(43.18)	
20-35	23	19.17	31	25.83	36	30.00
36-50	57	47.50	50	41.67	58	48.33
51-65	36	30.00	39	32.5	22	18.33
65+	4	3.33	0	0	4	3.33
Gender:						
Male	37	30.83	50	41.67	51	42.50
Female	83	69.17	70	58.67	69	57.50
Marital status:						
Married	94	78.33	102	85.00	99	82.50
Otherwise	26	21.67	18	15.00	21	17.50
Household size:	(5.38)		(5.21)		(5.80)	
1-5	71	59.17	73	60.83	50	41.67
6-10	43	35.83	45	37.5	70	58.33
11+	6	5.00	2	1.67	0	0.00
Educational level:						
No education	59	49.17	79	65.83	91	75.83
Basic education	32	25.83	24	20.00	16	13.33
SHS and others	16	13.34	11	9.17	5	4.17
Tertiary	13	10.83	6	5.00	8	6.67
Religious affiliation:						
Christianity	83	69.17	30	25.00	8	6.67
Islam	35	29.17	85	70.83	109	90.83
Traditionalist	2	1.67	5	4.17	3	2.50
Amount of loan	(1260.42)		(1103.13)		(1117.67)	
50-500	50	41.67	68	56.57	60	50.00
501-1000	26	21.67	23	19.17	36	30.00
1001-2000	24	20.00	16	13.33	12	10.00
2000-5000	19	15.83	10	8.33	6	5.00
5000+	1	0.83	3	2.50	6	5.00

Note: Means (averages) in parentheses

Source: Field Survey, 2018

4.1.3 Marital status of beneficiaries

Results in Table 4.1 revealed that majority of the beneficiaries representing 81.94% were married, and 18.06 were not married (widowed, divorced, separated or never married). Comparatively, the formal system had most of its beneficiaries being married (85%), followed by the indigenous system with 82.50 percent and the least being the semi-formal system with 78.33 percent as seen in Table 4.2. This means that majority of the beneficiaries have additional people to cater for and hence, are more likely to use loans contracted in productive ventures.

4.1.4 Religious affiliation of beneficiaries

In terms of the religion of beneficiaries, results in Table 4.1 indicate that 31.39% of the beneficiaries are Christians, 66.67% are Muslims and only 1.94% of them being traditionalists. From Table 4.2 it can be realised that out of the 120 beneficiaries of formal microfinance system, 83 representing 69.17% percent of are Christians, followed by Muslims with 29.67% and the least being traditionalists with 1.67%. In the case of the semi-formal microfinance system, the largest number, 70.83%, of the beneficiaries are Muslims, followed by Christians with 25% and the least being the traditionalist with 4.17%. In the case of the indigenous microfinance system, 90.83%, of the beneficiaries are Muslims, followed by Christians with 6.67% and the least being the traditionalist with 2.50%.

With all beneficiaries having religious affiliation to one religion or the other, it is expected that they will be honest in their dealings with the microfinance institutions and hence, ensure that their loans are put to good use so as to enable

them repay loans. Granted that this happens, it will make the institutions more viable.

4.1.5 Size of beneficiary households

The mean household size in the study area as indicated in Table 4.1 is 5.47 with minimum and maximum household size being 2 and 15 people respectively. The mean household size of beneficiaries of the formal, semi-formal and indigenous systems are 5.38, 5.21 and 5.80 respectively as can be observed from table 4.2. It can therefore be said that on average, beneficiary's households of the indigenous microfinance system have a larger household size relative to the others. Majority (53.89%) of households have a household size from 1 to 5 people followed by those with household size from 6 to 10 representing 43.89% and finally by those with size above 10 (2.22%). The large household size of beneficiary households implies that family labour will be available for the economic activities of these households which can lead to high output- particularly in the agricultural sector since majority of the households are engaged in farming. The implication is that households with large size can have access to cheap labour and hence increase productivity. However, larger household size as observed by Ijioma & Osondu, (2015), could lead loan diversions for consumption smoothing.

4.1.6 Amount of loan

From Table 4.1, it can be observed that majority of the beneficiaries received smaller amount of loans relative to the overall mean amount of loan (GHS 1,160.40). This is consistent with the findings of Ansoglenang (2006) who reports that amount of credit received by beneficiaries in the region are usually

meagre. Of the 360 beneficiaries, 178 of them representing 49.45% received an amount between GHS50 to GHS500, eighty-five (85) of the beneficiaries representing 23.61% received an amount between GHS501 to GHS1000, followed by 14.44% and 9.72% of the beneficiaries who received an amount between GHS1001 to GHS2000 and GHS2001 to GHS5000 respectively. Only ten of the beneficiaries representing 2.78% managed to secure a loan above GHS5000. Comparatively, the average amount received by beneficiaries in the formal system is GHS1260.42, GHS1103.13 for those in the semi-formal and GHS1117.67 for beneficiaries in the indigenous microfinance system as observed in Table 4.2. On average it can be said that, beneficiaries in the formal microfinance system receive higher amounts of loans among the three systems, followed by the indigenous microfinance system and the least being the semi-formal microfinance system. The implication of this is that most of the beneficiaries may not be able to undertake any large scale income generating activity and hence may hinder their ability to pay back loans promptly.

4.1.7 Educational status of beneficiaries

Generally, more than half (63.61%) of beneficiaries of the three microfinance systems have no formal education. Eleven (11) respondents representing 3.06% had Adult literacy education, 25 beneficiaries representing 6.94% had primary education, 36 beneficiaries representing 10% had junior high school education, 12 of the beneficiaries representing 3.33% are form four leavers, 20 beneficiaries representing 5.56% had senior high school education. With regards to attaining higher education, 15 and 12 representing 4.17% and 3.33% of the beneficiaries had vocational/technical education and tertiary education respectively. Comparatively, 75.83%, 65.83% and 49.17% of the beneficiaries in the

indigenous, semi-formal formal microfinance systems respectively had no formal education. Out of the 120 beneficiaries of the formal microfinance system, thirty-two (32) representing 25.83% had basic education (adult literacy, primary and junior high school education), 16 of representing 13.34% had senior high and equivalent education, and 10.83% of them attaining tertiary education. In the case of the semi- formal microfinance system, twenty-four (24) of the respondents representing 20% had basic education (adult literacy, primary and junior high school education), 11 representing 9.17% had senior high and its equivalent education, and 5% of them attaining tertiary education. Regarding the indigenous microfinance system, sixteen (16) of the respondents representing 20% had basic education (adult literacy, primary and junior high school education), 5 of the beneficiaries representing 4.17% had senior high its equivalent education, and 6.67% of them attaining tertiary education. From Table 4.2, it can be deduced that the formal microfinance system comparatively has more formally educated beneficiaries. This nay as a result of some formal sector workers assessing loans from this source. Generally, the low level of education of majority of the beneficiaries implies that most of them will have problems with basic bookkeeping knowledge which may affect the sustainability of their businesses.

4.2 Types of Indigenous Microfinance and Support Systems in the Upper West Region

The outcome of the three focus group discussions held with local and elderly opinion leaders from the study area revealed borrowing from friends and relatives; ‘susu’ rotating loans and credit associations; group farming (kpetaa or

pajou); provision of farming services for in-laws (dieng-kuubu or heeli-pare); social donations during social occasions such as naming, funeral and marriage ceremonies; taking of crop and animal breeds from friends and relatives; and borrowing of farm implements particularly animal traction equipment from relatives and friends as the indigenous support systems prevailing within the study area. These practices cut across the three studied districts. However, respondents indicated that practices such as the provision of farming services for in-laws and group farming are no longer prominent in most communities within the region. Details of some of these indigenous support systems as reported by respondents are provided below.

Group farming ('kpetaah' as in Dagare and 'pajuoo' as in Issalin) according to respondents and participants of focus group discussions, is a situation whereby young men come together as a group to provide farm labour for each other in a rotational form agreed by the group. According to the indigenous people of the study area, this helps farmers to provide very important services to each other in times of need and builds unity among farmers.

In-law farming as narrated by the respondents and participants of focus group discussions, involves the provision of farm labour or cash by husbands to their father in- laws on yearly basis to show their appreciation to their in-laws for giving out their daughters to them in marriage. This unfortunately, according to the respondents is gradually diminishing among the indigenous people of the region due to migration to the southern parts of the country, engagement of the youth in other economic activities other than farming, and modernity. They indicated that some in-laws accept a sheep in place of this support system.

Social donations also emerged as one of the indigenous support systems among the indigenous people of the study area. According to respondents, these donations are normally made at occasions such as marriage, naming, and funeral ceremonies to provide support to friends and relatives in these times of need. This indigenous support system was regarded as one of the dominant support systems among the indigenous people of the region.

In addition to these, one other indigenous support system in the region is the acquisition of crop and animal breeds, animal traction and other local industrial and farming implements from friends and relatives. This was also reported as very significant support system among the people of the region particularly those in the rural parts of the region engaged in farming and other indigenous economic activities such as 'pito' brewing.

During the focus group discussion, a participant had this to say: "These support systems have been very helpful. However, in-law farming which has in the past played very important role in the development of our farming activities is on the decline due to migration of the youth to the southern parts of the country and engagement in occupations other than farming by the youth".

Another participant said; 'During times of difficulty such as funerals and disasters, donations from friends and relatives help families to overcome their financial difficulties'. "Also, of recent times, when a young man marries your daughter, he moves away with her to the south and mostly does not participate in helping you on your farm as his In-law as used to be the practice in the past"

A contributor at a focus group discussion in Kowei in the Sissala East District had this to say in respect of in-law farming: "Most of the youth are into other economic activities other than farming and as such are unable to provide this support to their in-laws".

4.3 Influence of Indigenous Microfinance System on Activities of Formal and Semi-Formal Microfinance Systems

On whether the formal and semi-formal microfinance institutions incorporate some indigenous microfinance practices in their operations, 66.67% of the respondents answered in the affirmative in the case of the formal institutions and 74.17% in the case of the Semi-formal institution as indicated in Table 4.3 while 33.33% and 25.83% percent responded in the negative for the formal and semi-formal institution respectively.

Table 4. 3: Responses on whether operations of Formal and Semi-Formal Microfinance Systems are Influenced by Indigenous Microfinance system

	Formal system		Semi-formal system	
Influence status	**Freq.**	**%**	**Freq.**	**Percent**
No	40	33.33	31	25.83
Yes	80	66.67	89	74.17
Total	**120**	**100.0**	**120**	**100.0**

Source: Field Survey, 2018

This clearly implies that formal and semi-formal microfinance institutions have their operations being influenced by indigenous microfinance practices. But the influence is greater in the case of the semi-formal institution compared to that of the formal institutions as indicated in Table 4.3. Among the indigenous practices indicated by the respondents are; use of family ties and group solidarity in the formation of microfinance beneficiary groups for the disbursement of

micro-loans under the group lending model by the formal and semi-formal microfinance institutions; use of group solidarity as social collateral for the granting of loans to clients by the formal and semi-formal microfinance institutions; and the use of 'susu' as a method of organising clients for the disbursement of loans and mobilisation of savings by these institutions. By blending formal microfinance practices with indigenous microfinance practices, it can be concluded that the microfinance operators in the Upper West Region practice endogenous development.

To determine whether the formal and semi-formal microfinance institutions respect the local culture of their areas of operations, respondents were asked if their institutions respect their local culture. Under the formal microfinance system, 108 beneficiaries, representing 90% responded in the affirmative, while 12 beneficiaries, representing 10 percent, answered in the negative as indicated in Table 4.4. In the case of the Semi- formal system, 101 people representing 84.17% answered in the affirmative while 19 people representing 18.83% answered in the negative.

Table 4. 4: Responses on whether Formal and Semi-Formal Microfinance Institutions respect the Culture the Local people

	Formal system		Semi-formal system	
Respects?	**Freq.**	**%**	**Freq.**	**Percent**
No	12	10	19	18.83
Yes	108	90	101	84.17
Total	**120**	**100.0**	**120**	**100.0**

Source: Field Survey, 2018

This implies that both the formal and semi-formal microfinance institutions largely respect the culture of the people within their localities of operation. But

from Table 4.4, it can be realised that formal institutions do respect the local culture more than the semi- formal institution given that the number of those who responded in the affirmative in the case of the formal institutions is more than that of the Semi- formal institutions. Respondents indicated that the institutions make use of loan officers who are mostly from their localities and speak their language. The respect of local culture by these institutions may serve as a confirmation of the views of the majority of the respondents that these institutions are influenced by some elements of indigenous practices in the study area.

4.4. Test for Endogeneity and Multicollinearity

In using the OLS model, endogeneity between loan amount and household income was suspected. The control function approach was used to test for endogeneity. This approach specifies the use of an instrument for the endogenous variable. Access to alternative livelihood sources was used as an instrument for income. The approach dictates that a regression (formally referred to as a reduced form model) using the endogenous variable as a dependent variable is estimated with all the explanatory variables including the instruments among the regressors. The residual of this model is generated and included as an explanatory variable in the loan amount model. The significance of the residual indicates the presence and correction for endogeneity. The results (see appendix 49) indicates that access to alternative livelihood sources is significant in the income model which means that it is a good instrument for predicting income of households. The results for the test for the validity of the instrument (see appendix 50) show that the instrument is valid since it is not correlated with the

residual of the reduced form income model. The inclusion of the residual in the loan amount model (see appendix 51) is not significant and indicates the absence of endogeneity between loan amount and income. Consequently, the ordinary least square (log-log) model was used for the generation of the results.

Multicollinearity among the endogenous variables was also tested for using the Variance Inflation Factor (VIF) method. The mean VIF of 2.75 (see appendix 52) reveals the absence of multicollinearity among the explanatory variables.

4.5 Comparative Analysis of the Determinants of Loan Amount Received by Beneficiaries

The determinants of amount of loan received by beneficiaries were estimated using log -log regression. Four models under two main categories were estimated: three models (one for each of the three microfinance systems) were estimated under the category of microfinance system type and one model was estimated under the category of a general model involving all the three systems. The results of all these estimates are presented in Table 4.5. The first three columns are the results for the system type and the fourth column presents the results for the general model.

The first section of the discussions entails a comparison of the determinants of the three systems. The results indicate that distance has a negative effect on the amount of loan received in the indigenous microfinance system. However, when observed in the formal and semi-formal microfinance systems, distance is not a significant factor in determining the amount of loan received. Specifically, the coefficient of distance (-0.377) under the indigenous system implies that a 1%

increase in the distance travelled by beneficiaries to access loan will decrease the amount of loan received by beneficiaries approximately by 0.377% under the indigenous microfinance system. This could be due to the fact that the indigenous sources of microfinance are based on group solidarity and operate very close to their clients. Hence, as one moves away from his or her locality, it becomes very difficult to assess credit since he or she may not be known and hence, regarded as a risky client.

Age of the beneficiary is a statically significant determinant of loan amount received under both the indigenous microfinance system and semi-formal microfinance system at 10% but not significant under the formal microfinance system. The results show that the age of beneficiary is negatively related to amount of loan received under both the indigenous and semiformal microfinance systems. The coefficients (- 0.712 and 0.971) indicate that a 1% increase in age of a beneficiary is estimated to reduce amount of loan by 0.712% and 0.971% in the case of the indigenous and semiformal microfinance systems respectively. The results support the findings of Anyiro & Oriaku (2011) and Baiyegunhi et al. (2010). Their justification of the inverse relationship of age and demand for credit is that risk-averse behaviours are often associated with older people hence being old deters one from participating in the credit market. It could further imply that older people are regarded as risky clients by the microfinance institutions.

Furthermore, household size was found to be statistically significant under the formal and semi-formal microfinance systems. This indicates that household size is a good predictor in determining loan amount received by beneficiaries

under the formal and semi-formal microfinance systems. It is however statistically not significant under the indigenous microfinance system. The coefficient s (-1.231 and -0.651) indicate that an increase in household size by 1% is estimated to have a decreasing effect of 1.231% and 0.651% on the loan amount received by beneficiaries under the formal and semi-formal microfinance systems respectively. These findings confirm the finding of Ma-Azu (2015), in his study of the determinants of access to credit and its impact on household food security in Karaga district of the Northern region of Ghana. The author finds household size to be highly significant with a negative coefficient of 0.0018 at 1% level of significance. They also corroborate Bendig et. al. (2009) explanation that larger households are likely to consume a large share of their income which leaves them with less income to save and hence less collateral. This leaves them with no option than to apply for a small amount of loan since they do not have huge collateral for a larger amount of loan. This may also be due to the fact since most of the beneficiary households are into farming, larger household size may imply more farm labour that may lead to higher output and hence, such households may not require larger loans for engagement of farm labour and consumption smoothing.

Group size or number in a solidarity group was found to be statistically significant and negative factor influencing the amount of loan received under the semi-formal microfinance system at 10%. The coefficient of -0.463 implies that an increase in group size by 1% will reduce the amount of loan received by approximately 0.463% under the semi-formal microfinance system. This implies that the larger the size of the group, the smaller the amount of loan obtained by each member under these two systems. This could be due to the fact that larger

group size is more likely to have some members defaulting thereby reducing their chances of accessing larger amount of loans under these two systems. It may also imply that larger groups share loans among larger number of members hence, reducing the amount of loan received by members on the average.

The interest rate has a positive effect on the amount of credit and this is statistically significant at 10% under the semiformal microfinance system but not significant under the indigenous and formal microfinance systems. This implies that the higher the interest rate the larger the amount of loan contracted by beneficiaries under this system. Specifically, a 1% increase in interest rate will increase the amount of loan by 2.598%. This result contradicts with the findings of Balogun & Yusuf (2011) and Nwaru et al. (2011) who report a negative effect of interest rate on demand for a loan. The result further contradicts the findings of Owusu-Antwi & Antwi (2010) also see interest rate as the main challenge to demand for loans thus suggesting an inverse relationship. It again confirms the finding of Amonoo et. al. (2003) who find that interest rate has a negative effect on demand for credit.

Dependency Ratio positively affects the amount of loan received by beneficiaries of the formal microfinance system and is statistically significant at 10%. It is however not significant under the indigenous and semiformal microfinance systems. This implies that a higher dependency ratio increases the amount of loan received under the formal microfinance system. Specifically, the

coefficient of 0.388 implies that a unit increase in the dependency ratio will increase the amount of loan received by beneficiaries under the formal microfinance system by 0.388%. This implies that beneficiaries from households with more dependents may require larger amounts of loans to cater for such dependents hence, resulting in the amount of loans received by such beneficiaries being large. Contrary to this finding, Kedir (2003) explained that more dependents serve as a disincentive for borrowing as it has an implication on the profitability of the loan.

The number of years of schooling by a beneficiary has a positive effect on amount of loan received under the formal and semiformal microfinance systems and is statistically significant at 10% for both systems but not significant under the indigenous system. The coefficients 0.218 and 0.131 imply that a 1% increase in the number of years of schooling of a beneficiary increases the amount of loan by approximately 0.218% and 0.131% under the formal and informal microfinance systems respectively. The results conform the findings of Ma-Azu (2015) who observed that a unit increase in years of formal education results in an increase in the amount of loan received. This also agrees with Sekyi (2017) who finds that highly educated households are more likely to receive larger loan amounts than their least educated counterparts.

Table 4. 5: Log-Log results of determinants of amount of loan received

Variables	Institution type			Overall
	Formal	Semi-formal	Indigenous	
lnLAMT	Coefficient	Coefficient	Coefficient	Coefficient
lnDIST	0.154	0.112	-0.377***	0.174*
	(0.169)	(0.170)	(0.099)	(0.077)
Belong	-0.230	-0.116	0.846***	0.147
	(0.235)	(0.253)	(0.298)	(0.116)
lnhhinc	0.434*	0.332*	0.448**	0.404***
	(0.175)	(0.142)	(0.114)	(0.083)
lnAGE	0.427	-0.971*	-0.712*	-0.527*
	(0.370)	(0.400)	(0.371)	(0.221)
GEN	0.048	0.574**	-0.093	0.445***
	(0.222)	(0.191)	(0.193)	(0.113)
lnHSIZE	-1.231**	-0.651*	0.022	-0.881***
	(0.442)	(0.294)	(0.358)	(0.208)
DR	0.388*	0.165	-0.066	0.254**
	(0.212)	(0.125)	(0.142)	(0.085)
lnYears_edu	0.218*	0.131*	-0.043	0.153**
	(0.090)	(0.078)	(0.079)	(0.050)
lnNumber	-0.423	-0.463**	-0.053	-0.216***
	(0.269)	(0.134)	(0.082)	(0.055)
MFINFO	0.474	1.478***	1.141**	0.932***
	(0.630)	(0.390)	(0.324)	(0.239)
lnEXP	-0.520*	-0.408	-1.059*	-0.254
	(0.287)	(0.289)	(0.610)	(0.172)
lnIR	2.558	2.598*	0.335	-0.198*
	(3.865)	(1.323)	(0.489)	(0.114)
lnREPP	0.465	0.898***	1.005***	0.897***
	(0.425)	(0.198)	(0.124)	(0.119)
Constant	-6.106	-2.960	1.738	4.753***
	(13.421)	(5.169)	(2.448)	(1.257)
Observations	120	120	120	360
F-statistic	7.32***	14.22***	21.77***	16.70***
R^2	0.363	0.595	0.620	0.369

***, **,* indicates values statistically significant at 1, 5 and 10%, respectively; standard errors in parentheses.
Source: Field Survey, 2018

Belonging to a solidarity group is statistically significant at 5% and positively related to the amount of loan received under the indigenous microfinance system but not statistically significant in respect of the formal and semi-formal microfinance systems. The coefficient is 0.846 and implies that beneficiaries

who belong to solidarity groups receive approximately 0.846% of loan amount more than those who do not belong to any solidarity group. This may be due to the fact that the indigenous microfinance system relies on group solidarity for its survival and hence, clients who do not belong to such solidarity groups will be regarded as risky clients and will be given smaller amounts of loans as compared to those who have membership of solidarity groups.

Surprisingly, interest rate is statistically significant with a positive effect on the amount of loan received by beneficiaries under the semi-formal microfinance system but statistically insignificant under the formal and indigenous microfinance systems. The coefficient of interest rate is 2.598 which implies that an increase in the interest rate by 1% will increases the amount of loan by approximately 2.598% under the semi-formal microfinance system.

Household estimated income is found to be statistically significant with a positive influence on the amount of loan received under all the microfinance systems. Among these systems of microfinance, household estimated income has the greatest significant impact on amount of loan received under the indigenous microfinance system followed by the formal system and the least effect on the amount of loan under the semi-formal microfinance system. These results are statistically significant at 1% under the indigenous microfinance system and at 10% in the case of both formal and semi-formal systems of microfinance. This implies that as income of households increases, the amount of loan obtained from all three sources increases. Specifically, a 1% increase in income of beneficiary households will lead to an increase in the amount of loans received by 0.448%, 0.434% and 0.332% under the indigenous, formal and

semi-formal microfinance systems respectively. This is not surprising since income is an indicator of the creditworthiness of borrowers. The results reinforce the findings of Petrick (2002), Henri-Ukoha et al. (2011), Bendig et al. (2009), and Mpuga (2010) that the amount of loan received by households is influenced by the level of their income.

The repayment period of current loan is a statistically significant factor in determining the amount of loan under the indigenous and semi-formal microfinance systems and is positively related to the amount of loan received. This implies that longer repayment periods are associated with a higher amount of loan received by beneficiaries. Under both indigenous and semi-formal microfinance systems, repayment period of current loan is statistically significant at 1% with the coefficients of 1.005 and 0.898 respectively. This implies that an increase in the repayment period of current loan by 1% will increase the amount of loan received by 1.005% and 0.898% in the indigenous and semi-formal systems respectively. Repayment period was found not to be a significant determinant of loan amount received under the formal microfinance system. This may be attributed to the fact that the longer the repayment period, the longer the time with which beneficiaries can work with the loan, the smaller the instalment payment and hence the lower the repayment burden. The finding is consistent with Tanveer (2012) who found payback period to be statistically significant in his study of factors influencing demand for credit from formal and indigenous sources in Gujranwala district, Pakistan.

Gender is statistically significant and positively influences the amount of loan received by beneficiaries in the semi-formal system of microfinance but is not

statistically significant and hence, does not play a significant role in determining the amount of loan received from formal and indigenous microfinance systems. The coefficient of gender is 0.574 and significant at 5% level. This implies that the amount of loan received by males is approximately 0.574% higher than their female counterparts under the semi-formal system of microfinance. This finding is consistent with Mpuga, (2010), who reveals that male beneficiaries often have a more risk-bearing ability that influences their relatively higher demand for credit. This revelation could also be due to the fact that male-headed households predominate in the study area which gives males control over economic resources than their female counterparts and hence, makes them more credit worthy than their female counterparts.

The experience of a beneficiary at borrowing is statistically significant at 10% under both the formal and indigenous microfinance systems and negatively related to the amount of loan received under both systems. The coefficients of the experience of beneficiary at borrowing are -0.520 and -1.059 under the formal and indigenous microfinance systems respectively. Thus, a 1% increase in the experience of a beneficiary at borrowing reduces the estimated amount of loan received by 0.520% and 1.059% in the formal and indigenous microfinance systems respectively. This may be due to the fact that for borrowers to become more experienced at borrowing, they should have taken several number of loans and may therefore not require any large amounts of loans. It can also imply that borrowers with vast experience at borrowing know the responsibilities that are associated with these loans such as high interest repayment and hence, will not go in for larger amounts of loans

Access to microfinance information is statistically significant at 1% and positively related to the amount of loan received under the indigenous and semi-formal systems of microfinance. Access to microfinance information is observed to have a higher effect on the amount of loan in the semi-formal system than the indigenous system. Thus, the coefficient of access to microfinance information is 1.478 and 1.141 in the semi-formal and indigenous microfinance systems respectively. Specifically, beneficiaries with access to microfinance information will receive amount of loans 1.478% and 1.141% higher than their counterparts who do not have access to microfinance information under the semi-formal and indigenous systems of microfinance respectively. However, when access to microfinance information was estimated under the formal microfinance system, the results revealed that it is not a significant factor in the determination of the amount of loan received. This may be due to the fact that access to microfinance information enhances the propensity of the borrowers under these two microfinance systems to go in for larger loans since they turn to be more informed about the institutions and loan modalities.

The results in general indicate that household income, gender of beneficiary, dependency ratio, years of schooling, access to microfinance information, distance, and repayment period of current loan have positive influence on the amount of loan accessed by beneficiaries. Alternatively, interest rate, age of beneficiary, household size, number in solidarity group, and experience at borrowing, are shown to have negative influence on the amount of loan received by beneficiaries as indicated by the estimated results in table 4.5.

The interest rate has a negative effect on the amount of credit in general and this is statistically significant at 10%. The coefficient of this variable is -0.198 which implies that the higher the interest rate the smaller the amount of loan contracted by beneficiaries. Specifically, 1% increase in interest rate will reduce the amount of loan by 0.198%. This result agrees with the findings of Balogun & Yusuf (2011) who report a negative effect of interest rate on demand for a loan from moneylenders. The finding is consistent also with that of Nwaru et al. (2011) that report a negative effect of interest on demand for indigenous loans. The result further corroborates the findings of Owusu-Antwi & Antwi (2010) who also see interest rate as the main challenge to demand for loans thus suggesting an inverse relationship. It again confirms the finding of Amonoo et. al. (2003) who find that interest rate has a negative effect on demand for credit.

The coefficient of repayment period of current loan (0.897) implies that an increase in the repayment period of current loan by 1% would increase the amount of loan by approximately 0.897%. This is statistically significant at 1%. This implies that the longer the repayment period, the larger the amount of loan beneficiaries will receive from the lending institutions. This can possibly be attributed to the fact that the longer the repayment period, the longer the time with which beneficiaries can work with the loan, the smaller the instalment payment and hence the lower the repayment burden. The finding is consistent with Tanveer (2012) who found payback period to be statistically significant in his study of factors influencing demand for credit from formal and indigenous sources in Gujranwala district, Pakistan.

Household size has a negative effect on the amount of loan received by beneficiaries and is significant at 1%. The coefficient of household size is -0.881 implies that an increase in household size by 1% will decrease the amount of loan by approximately 0.881% holding all the other factors constant. This finding conforms to the finding of Ma-Azu (2015), in his study of the determinants of access to credit and its impact on household food security in Karaga district of the Northern region of Ghana. The author finds household size to be highly significant with a negative coefficient of 0.0018 at 1% level of significance. Bendig et. al. (2009) explained that larger households are likely to consume a large share of their income which leaves them with less income to save and hence less collateral. This leaves them with no option than to apply for a small amount of loan since they do not have huge collateral for a larger amount of loan. However, the finding is contrary to Tanveer (2012) who finds household size to be positively related to demand for credit.

Moreover, the dependency ratio is one of the major factors that influence the amount of loan received under the microfinance systems. It has a positive and a statistically significant impact on the amount of loan received at 5%. Specifically, the coefficient (0.254) means that the amount of loan would increase by approximately 0.254% if the dependency ratio increases by 1%. This can possibly be attributed to the fact that large number of dependents will increase households' consumption expenditure. Hence, households may have to borrow to supplement their income in order to smoothen household consumption. Contrary to this finding, Kedir (2003) explained that more dependents serve as a disincentive for borrowing as it has an implication on the profitability of the loan.

The results further reveal a positive relationship between the amount of loan and years of schooling. The years of formal education attained has a statistically significant positive effect on the amount of loan received at 5%. The coefficient of years of schooling (0.153) implies that a 1% increase in years of schooling will lead to approximately 0.153% increase in the amount of loan received. This result supports the findings of Ma-Azu (2015) who observed that a unit increase in years of formal education results in an increase in the amount of loan received. This also agrees with Sekyi (2017) who finds that highly educated households are more likely to receive larger loan amount than their least educated counterparts.

The gender of loan beneficiary also has a statistically significant impact on the amount of loan received at 1%. The results revealed a positive relationship between gender and the amount of loan received. This implies that males are more likely to receive a higher amount of loan than their female counterparts. Specifically, the coefficient of gender (0.445) implies that males receive 0.445% of loan higher than their female counterparts. This finding is consistent with what is widely believed in empirical literature that the male beneficiaries often have a more risk-bearing ability that influences their relatively higher demand for credit (Petrick, 2002; Mpuga, 2010; Bendig et al. 2009). This revelation could also be due to the fact that male-headed households predominate in the study area which gives males control over economic resources than their female counterparts.

The results further indicate that distance has a positive effect on the amount of loan received in general terms at 10%. Specifically, the coefficient of distance

(0.174) implies that a 1% increase in the distance travelled by beneficiaries to access loan increases the amount of loan by approximately 0.174%. This agrees with Sekyi (2017) who indicated amount of loan received increases with distance. Specifically, he revealed that for every additional kilometer travelled by rural households to access credit from a credit institution, loan amount increases by GHS 13.72.

This finding is however in contradiction with the views of Awunyo-Vitor & Abankwah (2012), and Balogun & Yusuf (2011). They report that proximity to financial institution influences demand for credit. Specifically, they indicated that demand for credit decreases with distance travelled to access it. It further contradicts with the findings of Hussien (2007) who argues that households are discouraged to borrow from credit institutions if they are located farther away from their place of residence. According to him, this is mainly because both temporal and monetary costs of transaction, especially transportation cost increase with lender-borrower distance which increases the effective cost of borrowing.

Access to microfinance information greatly influences the size of loan one obtains. From the results, access to microfinance information is highly statistically significant at 1%. The results showed a positive relationship between access to microfinance information and the amount of loan received. This implies that beneficiaries with access to microfinance information receive loan amounts greater than their counterparts without access to microfinance information. Specifically, the coefficient of 0.932 implies that beneficiaries with access to microfinance information receive loan amounts 0.932% more than

their counterparts without access to microfinance information. This may be due to the fact that access to microfinance information makes borrowers more informed about microfinance institutions and loan modalities and hence, enhances their propensity to go in for larger loans.

Estimated household income is statistically significant at 1% and has a positive relationship with the amount loan received. The coefficient of estimated household income (0.404) means that the amount of loan received would increase by approximately 0.404% if household estimated income increases by 1%. A plausible explanation for this finding is that estimated household income may serve as collateral against loans and also increase creditworthiness of households. This makes it possible for such households to receive larger amount of loans. This result reinforces the findings of Petrick (2002), Henri-Ukoha et al. (2011), Bendig et al. (2009), and Mpuga (2010) that the amount of loan received by households is influenced by the level of their income.

The age of the beneficiary is a statically significant determinant of loan amount and at 10% level of significance. The coefficient of Age (-0.527) implies that an increase in the age of a beneficiary by 1% would decrease the amount of loan received by approximately 0.527%. Thus, as the beneficiary advances in age less amount of loan is received. This finding is supported by Anyiro & Oriaku (2011) and Baiyegunhi et al. (2010). Their justification of the inverse relationship of age and demand for credit is that risk-averse behaviours are often associated with older people hence being old deters one from participating in the credit market.

4.6. Determinants of Beneficiaries' Choice of Microfinance System for Loan.

Multinomial Probit models are used in a case where the dependent variable is more than one category. Each category is compared to the reference group, in this study, the indigenous microfinance system. The results show that the probability of households accessing credit from a microfinance system is influenced to a great extent by gender (GEN), primary occupation of the beneficiary (POCC), household size (HSIZE), dependency ratio (DR), the number of children in school (NCHLD), the number of children of school going age (No _ children) , the number of people in a lending group or association (Number), the interest rate charged (Interest), the time it takes to repay the current loan (REPP), access to information on microfinance (MFINFO), the distance from the credit source (DIST), the amount of current loan (LAMT), the borrowing experience of the beneficiary (EXP), household's asset value (ASET), household estimated income (HINCH), the income level of the household head (income-d), the income level of the beneficiary (income_1) and the number of household members employed (Employed) as shown in Table 4.6.

The coefficient for gender is negative for the probability that males will choose to access credit from formal microfinance institutions but positive in the case of semi-formal institution relative to the indigenous credit institution. It is statistically significant at 10% for formal and significant at 1% for semi-formal microfinance systems. This means that male beneficiaries are less likely to access credit from the formal microfinance system vis -a- vis the indigenous microfinance system. Specifically, the marginal effect predicts that males are

16.2 percentage points less likely to access credit from formal microfinance system relative to the indigenous microfinance system. This revelation is in contrast with the widely held view in empirical literature that male beneficiaries often have a more risk-bearing ability that influences their relatively higher demand for credit from formal financial institutions (Mpuga, 2010; Bendig et al. 2009). The fact that the beneficiaries are predominantly resident in rural communities who may not have the collateral requirements of formal financial institutions may account for their preference for indigenous source of credit where such requirements are not very stringent (indigenous microfinance systems resort to the use of group solidarity).

On the other hand, male beneficiaries are more likely to opt for credit from semi-formal microfinance system compared to indigenous microfinance system. The marginal effect predicts that males are about 26.6 percentage points more likely to access credit from semi-formal microfinance system compared to indigenous microfinance system. This can be attributed to the use of solidarity group lending methodology by the semi-formal system, their proximity to rural households and the relatively lower interest they charge.

Table 4. 6: Multinomial probit results of determinants of choice of Microfinance system for loan.

Variable	Formal		Semi-formal	
	Coefficient	Marginal effects	Coefficient	Marginal effects
GEN	-0.0140	-0.1634*	0.9043	0.2658***
	(0.4275)	(0.0836)	(0.3538)	(0.0835)
AGE	0.0084	0.0002	0.0106	0.0164
	(0.0164)	(.0036)	(0.0143)	(0.0038)
POCC	-1.8121	-0.3727***	-0.3661	0.2093**
	(0.4759)	(0.8889)	(0.3562)	(0.0966)
LIVEHD	1.0482	0.0913	0.9856	0.1221
	(0.4390)	(0.0846)	(0.3729)	(0.0193)
HSIZE	0.5969	0.2351***	-0.4569	-0.2473***
	(0.3780)	(0.0761)	(0.3213)	(0.0771)
DR	-1.3015	-0.4889***	0.8669	0.5002***
	(0.8481)	(0.1694)	(0.7257)	(0.1728)
EDU	0.1372	0.0164	0.1005	0.0052
	(0.0902)	(0.0183)	(0.0802)	(0.0196)
NCHLD	-2.0010	-0.3812***	-0.7025	0.1559
	(0.5880)	(0.0953)	(0.5299)	(0.1041)
Number	-0.0702	-0.0268***	0.0492	0.0277***
	(0.0214)	(0.0049)	(0.0175)	(0.0048)
REPP	-0.2529	-0.0608***	-0.0182	0.0408***
	(0.1032)	(0.0226)	(0.0620)	(0.0201)
Interest	0.3247	0.0553***	0.1476	-0.0149
	(0.0441)	(0.0094)	(0.0371)	(0.0114)
MFINFO	-0.0327	0.1674	-1.0832	-0.2755*
	(1.2320)	(0.1654)	(0.7130)	(0.1600)
EXP	0.7895	0.0164***	0.5671	0.0267
	(0.2215)	(0.0258)	(0.2125)	(0.0299)
LAMT	0.0005	0.0001***	0.0002	-0.0003
	(0.0001)	(0.00003)	(0.0001)	(0.0003)
COLTRAL	-0.6781	-0.0509	-0.6292	-0.0532
	(0.5220)	(0.1206)	(0.4467)	(0.1212)
DIST	0.6032	0.0282*	0.6814	0.0953***
	(0.1638)	(0.0171)	(0.1580)	(0.0221)
ASET	-0.0001	3.03e-06	-0.0001	-0.0001*
	(0.0000)	(0.0001)	(0.0000)	(0.0001)
Employed	-1.8299	-0.6626***	1.0828	0.6622***
	(0.7924)	(0.1720)	(0.5651)	(0.1554)
No_chi~n	2.0596	0.3977***	0.6815	-0.1714*
	(0.5660)	(0.0896)	(0.5019)	(0.0959)
Income~d	-0.0003	-0.0003**	-0.0001	5.09e-06
	(0.0000)	(0.0002)	(0.0001)	(0.00002)
Income~1	-0.0002	-0.0001***	0.0003	0.0004***
	(0.0001)	(0.0002)	(0.0001)	(0.0002)
HINCH	0.0002	0.0004***	0.0001	0.0002
	(0.0001)	(0.0002)	(0.0001)	(0.0001)

***, ** and * denotes the level of significance at 1%, 5%, and 10% respectively with Standard errors in parenthesis

Source: Field Survey, 2018

The estimated coefficient of household size is positive and statistically significant at 1% level for the probability of households choosing formal microfinance system relative to indigenous microfinance system. This implies that as the households size increases, members are more likely to go in for loans from the formal microfinance system relative to the indigenous microfinance system. The marginal effect predicts that as household size increases by a person, the likelihood that a beneficiary household will access credit from a formal institution will increase by 23.5 percentage points relative to choice of indigenous microfinance system. This may be due to the fact that larger households usually have some of their members freed from the normal daily activities so as to go through the long process of loan disbursement associated with formal microfinance institutions. Hence, larger households are able to access larger amounts of loan from the formal microfinance system. This revelation can also be credited to the fact that loan sizes are relatively larger in the case of formal credit institutions than indigenous sources and since larger households may require larger loans to cater for their needs, they would prefer to access loans from the formal source relative to indigenous sources where loans are usually smaller. Household size is also statistically significant at 1% but negative for the probability of choosing semi- formal microfinance system against indigenous microfinance system. Thus, members will prefer loans from the indigenous microfinance system relative to the semi-formal microfinance system given that the household size increases. The marginal effect predicts that, the probability of accessing credit from the semi-formal microfinance system will decrease by 24.7 percentage points compared to the indigenous microfinance system, given that the household's size increases by a person. A

plausible reason for this finding could be that as household size increases, members can easily form groups to access loans from the indigenous sources which thrive so much on group solidarity.

The interest rate is positive and statistically significant at 1% for the likelihood that households will choose formal microfinance system relative to the base category. The marginal effect predicts that, as the interest rate increases by one percent, households are 5.5 percentage points more likely to choose a formal microfinance system relative to the indigenous microfinance system. This is consistent with findings of Owusu-Antwi & Antwi (2010) and Balogun & Yusuf (2011) who report that as the interest rate increases, the demand for loan from the indigenous sectors diminishes. This is understandable in the sense that, the interest rate charged under the indigenous microfinance system are far higher than the rate charged by the formal credit lending institutions. So, given that the interest rate further increases, people will prefer the formal microfinance system where the interest rate is relatively lower.

The coefficient for distance is positive and statistically significant at 10% for the probability of choosing a formal microfinance system relative to the indigenous microfinance system. Similarly, it is positive but statistically significant at 1% for the probability that beneficiaries will choose to access loan from semi-formal microfinance system relative to the base category. This implies that the farther away the credit institution is to the beneficiary, the more likely he/she will opt for formal and semi-formal microfinance systems relative to the indigenous microfinance system. The marginal effects predict that the farther away the credit institution is to the beneficiary by a kilometre, the probability that they

will choose formal microfinance system will increase by 2.8 percentage points relative to indigenous microfinance system. Similarly, the probability that they will choose semi-formal microfinance system will increase by 9.5 percentage points compared to indigenous microfinance system.

This is in contrast to the findings of Etonihu et. al. (2013) who observed a negative relationship between the distance and the choice of credit outlet. That is, the farther away the credit source is from the beneficiary, the less likely it is for him/her to access credit from that source. However, this discrepancy might be due to the fact that in the study area, the interest rate is relatively higher under the indigenous system, hence any beneficiary who has the means to travel to the district or regional capital where these formal and semi-formal credit institutions are located is more likely to choose formal and semi-formal credit sources which are predominantly located in these capitals and grant relatively larger loans at lower interest rates than their indigenous counterparts.

The time it takes for households to repay their current loan is also a significant factor influencing households' choice of a microfinance system. The repayment period for current loan is statistically significant at 1% for household's decision to choose both formal and semi-formal microfinance systems. It has a negative effect on households' decision to opt for formal microfinance system but positive effect on their choice of semi-formal microfinance system. The marginal effects show that if the repayment period increases by a month, the probability that households will choose to access loans from formal microfinance system will decrease by 6.1 percentage points and increase by 4.1 percentage points in the case of semi-formal microfinance system relative to the

indigenous microfinance system. The repayment period in the formal microfinance system is longer compared to the indigenous microfinance system, therefore, any additional increase in repayment period may discourage beneficiaries from borrowing from this source since the commutative interest on the principal will be very high.

The information beneficiaries have on microfinance institutions and credit is also a decisive factor influencing household's choice of a microfinance system. The coefficient is negative and statistically significant at 1% level for the probability that households will choose semi-formal microfinance system relative to an indigenous microfinance system. This implies that as beneficiaries acquire more information or knowledge in the operations of a microfinance system, they are less likely to go in for loans from the semi-formal microfinance system relative to the indigenous microfinance system. The marginal effect predicts that, given that a household has information about a microfinance system, they are 2.8 percentage points less likely to choose semi-formal microfinance system relative to the indigenous microfinance system.

The primary occupation of members of a household also influences the decision in choosing a credit lending source. The variable for primary occupation is negative and statistically significant at 1% for the probability that households will choose formal credit source as against indigenous credit source. Thus, beneficiaries whose primary occupation is arable crop farming are less likely to access credit from the formal microfinance system relative to the indigenous microfinance system. Also, it is positive and statistically significant at 5% for the likelihood of households choosing semi-formal credit source relative to the

indigenous credit source. The marginal effect predicts that beneficiaries' households whose primary occupation is arable crop farming are 3.7% percentage points less likely to choose formal credit institution and 2.1 percentage points more likely to choose semi-formal microfinance system as a loan source relative to indigenous microfinance system.

The number of children of school going age in a household is also a significant factor influencing the household decision in choosing a microfinance system as a loan source. It is statistically significant at 1% and 5% for a household's decision to choose formal and semi-formal microfinance systems as sources of credit respectively, relative to an indigenous microfinance system as a loan source. It is positively related to that of formal and negatively related to that of semi-formal microfinance system. This implies that households in which children of school going age are many, are more likely to choose formal microfinance system as a loan source compared to indigenous microfinance system as a loan source and are less likely to choose semi-formal microfinance system as a loan source relative to the indigenous microfinance system. The marginal effect predicts that given that number of children of school going age in a household increases by a child, households are about 39.7 percentage points more likely to choose formal microfinance system as a source of loan relative to the base category. This is understandable in the sense that, as the number of children of school going age increases, households may require a larger amount of loan to cater for the educational needs of their children and will therefore choose formal microfinance system sources which usually grant higher amounts with longer repayment periods and at lower interest rates. On the other hand,

they are 17.1 percentage points less likely to choose semi-formal microfinance system as a source of loan relative to indigenous microfinance system.

Closely related to the above factor is the number of children a household has in school. The variable is negative and statistically significant at 1% for the likelihood that a household will opt for loans from formal microfinance system as against the indigenous microfinance system. This implies that as the number of children in school increases, households are less likely to access loans from the formal microfinance system relative to the indigenous microfinance system. This could be attributed to the fact that households with children in school will require regular funding for their wards education and hence, will resort to more indigenous sources of credit which readily provide such short-term and regular loans. Additionally, considering the fact that the requirements for accessing loans from formal sources such as rural banks are complex, people will resort to borrowing from the indigenous sources where the process of accessing credit is comparatively easier. The marginal effect predicts that, if the number of children going to school in a household increases by one person, households are about 38.1 percentage points less likely to choose formal microfinance system as a source of loan relative to indigenous microfinance system.

The experience of a beneficiary at borrowing is statistically significant at 1% and positive for the probability of households choosing formal microfinance system as a loan source compared to indigenous microfinance system. This implies that as beneficiaries gain more experience at borrowing, they are more likely to borrow from the formal microfinance system as compared to borrowing from the indigenous microfinance system. The marginal effect predicts that

beneficiaries are 1.6 percentage points more likely to choose formal credit institution, given that the experience of the beneficiary at borrowing increases by a year relative to the indigenous microfinance system.

The coefficient of the estimated household income level is positive and statistically significant at 1% level for the probability that households will opt for loans from the formal microfinance system as against indigenous microfinance system. This implies that as household's income increases, they are more likely to choose a formal microfinance system relative to the indigenous microfinance system as a source of loan. The marginal effect predicts that as the income of a household increases by a cedi, the probability that it will choose to acquire loan from the formal microfinance system will increase by 0.00456 percentage points relative to an indigenous microfinance system. This is consistent with the findings of Alhassan, Li, Reddy, & Duppati (2019) who report that an increase in income levels decreases the likelihood of individuals using informal financial intermediation. To them, wealthy individuals are less inclined to choose informal finance relative options over formal financial intermediaries. Thus, as people income increases, they turn to prefer the services of the formal system relative to the indigenous system.

The dependency ratio is positive and statistically significant at 1% for the probability of households choosing semi-formal microfinance system relative to indigenous microfinance system. This implies that given that the dependency ratio increases, households are more likely to choose a semi-formal microfinance system as a source of loan relative to indigenous sources of loan. This is in contrast with the findings of Balogun & Yusuf (2011) whose results

indicate that households with a high dependency ratio have low demand for credit from NGO, and government agencies (which are largely semi-formal in nature) but corroborates with the findings of Mpuga (2010) who finds that households with higher dependency ratio will require more investment resources to keep the family going hence, compiling them to access loans from the NGO,s and other semi-formal institutions who might be more willing to grant the amount they need compared to the indigenous institution. The marginal effect predicts that households are about 50 percentage points more likely to choose semi-formal microfinance system as a source of loan relative to an indigenous microfinance system if the dependency ratio increases by a unit.

Also, the variable is negative and statistically significant at 1% for the probability that formal microfinance system would be chosen relative to the base category. Thus, as the dependency ratio increases, people are less likely to choose formal microfinance system as a source of loan relative to the indigenous type. The marginal effect shows that a unit increase in the dependency ratio will decrease the probability of households choosing formal microfinance system by 48.9 percentage points relative to the indigenous microfinance system. This could possibly be due to the fact that households with higher dependency ratio are mostly poor and hence, are unable to meet the collateral requirement for accessing loans from formal sources and will, therefore, resort to loan from the indigenous microfinance system.

The effect of asset value on the probability of choosing semi-formal microfinance system relative to the indigenous microfinance system is negative and statistically significant at 1% level. This implies that as the asset value

increases, the probability that households will access credit from the semi-formal microfinance system decreases relative to the indigenous microfinance system. The marginal effect predicts that given that the asset value of households increases by a cedi, they are 0.0016 percentage points less likely to access credit from semi-formal microfinance system relative to indigenous microfinance system.

Most people, especially in the rural areas, form or join groups or associations in order to have a common voice in their activities which includes accessing credit. Group size (the number of people in the group) is significant at 1% level and negatively related to a household's decision to access credit from the formal microfinance system relative to the indigenous microfinance system. This implies that as the group size increases, a member is less likely to access loan from the formal microfinance system but more likely to access loan from the indigenous microfinance system. This could be due to the fact that in the rural areas people depend much on group solidarity when it comes to accessing credit, so as the group size increases, members are more likely to go in for loans from the indigenous microfinance system where group solidarity and hence, group lending is a dominant criterion for credit disbursement. The probability that households will opt for loans from the formal microfinance system will decrease by 2.7 percentage points given that the group size increases by a person. The factor is also positively related to that of semi-formal microfinance system as compared to the indigenous sources. Thus, as the group size expands, the probability of members accessing credit from the semi-formal microfinance system increases relative to the indigenous microfinance system. The marginal effect predicts that the probability of accessing credit from the semi-formal

microfinance system increases by 2.8 percentage points relative to the indigenous microfinance system, given that the number of people in a group increases by a person.

The amount of loan currently accessed by a beneficiary is a significant factor influencing his/her decision in choosing between formal microfinance and indigenous microfinance system. It is positive and statistically significant at 1% level for the probability that a person will opt for loans from the formal microfinance system as against the indigenous microfinance system. The marginal effect predicts that if current loan amount increases by a cedi, households are about 0.009 percent more likely to access credit from the formal microfinance system as against accessing it from the indigenous system.

Number of employed members in a household also influences household's decision in the choice of accessing loan from a microfinance system. The variable is negative and statistically significant at 1% for the probability that a person will access the loan from a formal microfinance system but has a positive relationship with the probability of accessing it from a semi-formal microfinance system relative to the indigenous microfinance system. This implies that, as the number of employed members of a household increases, beneficiary households are less likely to source loan from the formal microfinance system but are more likely to source it from the semi-formal microfinance system relative to the base category. The marginal effects predict that the probability that households will access credit from the formal sector will decrease by 66.3 percentage points and about 66.2 % more likely to access credit from the semi- formal microfinance

system relative to the indigenous microfinance system, given that an extra person within a household is employed.

The income of the primary beneficiary has a negative relationship with the likelihood of accessing credit from a formal microfinance system but positively related to accessing it from semi-formal microfinance system. This is statistically significant at 1% level in both cases. Thus, as the income of the primary beneficiary increases, households are less likely to access credit from the formal microfinance system relative to an indigenous microfinance system. Similarly, as their income increases, they are more likely to opt for semi-formal microfinance system compared to indigenous microfinance system. The marginal effects predicts that the primary beneficiary is about 0.006 percent less likely to access credit from the formal microfinance system compared to an indigenous microfinance system given that his/her income increases by a cedi. Again, they are about 0.005 percent more likely to access credit from the semi-formal microfinance system relative to the indigenous microfinance system given that his/her income increases by a cedi.

The income of the household head also influences the decision in choosing a microfinance system as loan source. It is negative and statistically significant at 1% for the probability that the beneficiary households will choose formal microfinance system as against an indigenous microfinance system as a loan source. Thus, as the income of the household head increases, a beneficiary household is less likely to access loan from a formal microfinance system relative to an indigenous microfinance system. The marginal effects predict that the probability that beneficiary household will access credit from the formal

microfinance system decreases by 0.004 percentage points relative to accessing it from the indigenous microfinance system given that income increases by a cedi.

4.7. Impact of Participation in Microfinance Systems on Beneficiary Households

Determining the impact of microfinance on household outcomes represents the last objective of this study. In the evaluation, participants in indigenous microfinance system are used as the control group and participants in formal and semi-formal microfinance systems are used as the treatment groups. There are therefore three treatment arms: formal versus indigenous, semi-formal versus indigenous and both formal and semi-formal versus indigenous. The impact of these three treatment arms are evaluated on three outcomes: income of the direct beneficiary of the microfinance, income of the household of the beneficiary and value of the household assets. Furthermore, two estimators, PSM and teffects, are used. For the PSM estimates, the nearest neighbour and Kernel matching algorithms are used. The three different estimators (Nearest Neighbour Matching, Kernel Matching and Teffects) are to provide for robustness check. The results are presented according to the three treatment arms.

4.7.1. Impact of Formal Microfinance System on Income and Households' Asset Value

This section specifically presents results of whether there are differences in terms of beneficiary income, household income and household assets value between individuals participating in formal and indigenous microfinance

systems. Table 4.7 reports the results. The results show that consistently the estimates for all the estimators are positive and statistically significant in the case of income of microfinance beneficiaries. However, there is no significant effect on the value of household assets and income of beneficiary's household. This implies that individuals who participated in formal microfinance systems earn more income than individuals who participated in indigenous microfinance systems.

The ATT for the value of beneficiary income is GHS3522.824 by the NNM estimate and GHS3446.903 by the KM and statistically significant at 1%. This implies that participation in formal microfinance system increased the income of beneficiaries by between GHS3446.903 and GHS3522.824 yearly. The estimates from the Teffect estimator confirm the positive impact of the PSM estimates. The estimated impact is GHS1545.617 which is statistically significant at 10%.

The Average Treatment effect on the Untreated (ATU) represents the potential benefit of formal microfinance system on income of the control group (beneficiaries of the indigenous microfinance system). The results of the Kernel matching shows that beneficiaries of the indigenous microfinance system would have earned an income of GHS3824.436 yearly if they were beneficiaries of formal microfinance system.

Table 4. 7: Estimates of the impact of participation in formal microfinance system on income and assets value

Outcome	Effect	PSM		Teffects
		NNM	Kernel	NNM
Income of beneficiary	ATT	3522.824***	3446.903***	1545.617*
		(1072.188)	(870.5504)	(838.643)
	ATU	3196.27	3824.436*	-
		(3241.277)	(2269.21)	
	ATE	3343.381*	3655.391**	2641.108***
		(1873.664)	(1570.387)	(905.780)
Income of household	ATT	-8903.967	1345.014	-7222.775
		(19786.64)	(5576.456)	(13045.33)
	ATU	-6426.243	-4295.66	-
		(11266.96)	(10907.92)	
	ATE	-7542.446	-1769.985	-5277.65
		(12034.62)	(9828.489)	(11012.02)
Household asset	ATT	2459.967	2274.533	-774.6333
		(1728.452)	(2361.774)	(1919.206)
	ATU	-2512.991	-2036.686	-
		(1653.843)	(1529.065)	
	ATE	-272.698	-106.2896	-2083.033
		(1158.323)	(1594.195)	(1339.186)

Note Standard errors in parentheses; * $p<0.1$; ** $p<0.05$; *** $p<0.01$; NNM is nearest neighbour matching; one-to-one nearest neighbour matching used; the treatment is participating in formal system and the control is participating in indigenous microfinance system.
Source: Field Survey, 2018

The overall effect of microfinance on the income of beneficiaries is indicated by the ATE in Table 4.7. It is GHS3343.381 and GHS3655.391 under NNM and KM respectively. This implies that the income of the sample population of participants in the formal microfinance system increased by between GHS3343.381 and GHS3655.391 as a result of their participation in the formal microfinance system. The ATE was statistically significant at 10% and 5% under the NNM and KM respectively. The estimates show that participation in the formal microfinance system has a positive effect on the income of beneficiaries. The estimates from the Teffect estimator confirms the positive

impact of the PSM estimates. The estimated impact is GHS2641.108 which is statistically significant at 1%. It is observed from the PSM methods that the estimates of ATT are greater than the estimates of ATE. This implies that beneficiaries participating in the formal microfinance system achieve higher income as compared to those of the control group.

These results are consistent with the findings of Hume & Mosley (1996), and Mosely (2001). For example, Hume & Mosley (1996) found that the incomes of borrowers increased from 10-12% in Indonesia and about 30% in Bangladesh. Mosely (2001) observed that microcredit is associated with larger increases in income for borrowers as compared with non – borrowers in Bolivia.

The reasons why participation in formal microfinance institution will increase the income of beneficiaries may include the following. First, from the study, it was observed that the formal microfinance institutions are able to give out larger amount of loans compared to the other institutions. Thus, participants in this sector are able to have higher capital to venture into higher productive undertakings which demand larger start-up capital. Again, the repayment periods of the formal microfinance system are usually longer compared to the other. The implication is that those who receive credit from institution under this system can use them long enough to gain extra income. Furthermore, the interest rates under the formal microfinance system are the lowest relative to the other systems in the study area as indicated in the data. Given that the interest rate is low, participants will only pay a small amount as interest charges compared to the participants in the other systems who will pay higher amounts as interest charges.

4.7.2 Impact of Semi-Formal Microfinance System on Income and Households' Asset Value

This section specifically presents results of whether there are differences in terms of beneficiary income, household income and household assets value between individuals participating in semi-formal and indigenous microfinance systems.

Table 4. 8: Estimates of the impact of participation in semi-formal microfinance system on income and assets value

		PSM		Teffects
Outcome	Effect	NNM	Kernel	NNM
Income of beneficiary	ATT	1725.56	713.5729	852.917
		(1349.611)	(755.980)	(741.032)
	ATU	496.733	317.666	-
		(1110.644)	(533.438)	
	ATE	1100.733	504.182	592.533
		(848.23)	(651.607)	(495.436)
Income of household	ATT	2033.991	-6065.17	2284.592
		(10213.95)	(9384.186)	(14234.33)
	ATU	-11636.25	-11962.71	-
		(9672.578)	(12338.61)	
	ATE	-4916.979	-9184.314	-4515.392
		(10391.28)	(10606.02)	(11236.77)
Household asset	ATT	-2384.509	-2313.522	-4919.317**
		(3560.892)	(1775.211)	(2309.22)
	ATU	-4039.667***	-4108.704***	-
		(1256.212)	(1121.067)	
	ATE	-3226.114	-3262.974***	-3943.35**
		(2675.792)	(934.442)	(1593.829)

Note: Standard errors in parentheses; * $p<0.1$; ** $p<0.05$; *** $p<0.01$; NNM is nearest neighbour matching; one-to-one nearest neighbour matching used; the treatment is participating in semi-formal system and the control is participating in indigenous microfinance system.
Source: Field Survey, 2018

The value of ATT which is GHS4919.317, in the teffects is negative and statistically significant at 5%. This confirms that participation in the semi-formal microfinance reduces the value of the assets of beneficiaries. The Average

Treatment effect on the Untreated (ATU) represents the potential benefit or loss from participation in semi-formal microfinance on non-participants households. The results of the NNM and KM show that non-participants households would have loss values of their assets by between GHS4039.667 and GHS4108.704 if they were participating in the semi-formal microfinance system.

The value of ATE is negative and statistically significant at 1 % in the kernel matching. The value of 3262.974 shows that the overall effect of microfinance is GHS3262.974. The value of the ATE is greater than the value of ATT, which implies that households participating under the semi-formal microfinance system have lower asset value relative to those in the indigenous microfinance system. The estimates from the Teffect estimator confirms the negative impact from the PSM estimates. The estimated impact is GHS3943.35 which is statistically significant at 5 percent.

4.7.3 Impact of Formal and Semi-Formal Microfinance System on Income and Households' Asset Value

This section specifically presents results of whether there are differences in terms of beneficiary income, household income and household assets value between individuals participating in both formal and semi-formal and indigenous microfinance systems. Table 4.9 reports the results. Generally, the estimates indicate that participation in formal and semi-formal microfinance systems has a positive and significant impact on the income of beneficiaries and has a negative impact on the value of household assets. However, there is no significant impact on households' income.

The ATT for the value of income is GHS1156.50 under the NNM and is statistically significant at 10%, and GHS1130.31 under the KM and is significant at 5%. These imply that participation in formal microfinance system increased the income of beneficiaries by between GHS1130.31 and GHS1156.50 yearly. The estimates from the Teffect estimator confirm the positive impact of the PSM estimates. The estimated impact is GHS1352.17 which is statistically significant at 5%.

Table 4. 9: Estimates of the impact of participation in formal and semi-formal microfinance system on income and assets value

		PSM		Teffects
Outcome	Effect	NNM	KM	NNM
Income of beneficiary	ATT	1156.502*	1130.31**	1352.171**
		(693.119)	(506.565)	(582.763)
	ATU	473.15	510.975	-
		(803.140)	(497.492)	
	ATE	907.255*	904.413*	1149.122**
		(512.666)	(498.364)	(486.344)
Income of household	ATT	-5154.321	-5322.207	-1748.763
		(8837.263)	(6353.78)	(6607.145)
	ATU	-10582.89	-9778.91	-
		(10068.51)	(10262.15)	
	ATE	-7134.347	-6947.752	-4678.631
		(10155.95)	(7631.007)	(7300.077)
Household asset	ATT	-818.622	-641.410	-3296.988
		(1628.806)	(1183.644)	(2304.087)
	ATU	-3798.117***	-3092.828***	-
		(1203.183)	(1096.21)	
	ATE	-1905.368	-1535.545	-3349.153*
		(1260.061)	(1239.166)	(1820.255)

Note: Standard errors in parentheses; * $p<0.1$; ** $p<0.05$; *** $p<0.01$; NNM is nearest neighbour matching; one-to-one nearest neighbour matching used; the treatment is participating in both formal and semi-formal system and the control is participating in indigenous microfinance system.
Source: Field Survey, 2018.

The overall effect of microfinance on the income of beneficiaries is indicated by the ATE in Table 4.9. It is GHS904.413 and GHS907.255 under NNM and KM

respectively. This implies that the income of the sample population of participants in the formal and semi-formal microfinance systems increased by between GHS904.413 and GHS907.255 as a result of their participation in the two systems and this was statistically significant at 10% in both methods. The estimates from the Teffect estimator confirm the positive impact of the PSM estimates. The estimated impact is 1149.122 which is statistically significant at 5%.

It is observed from the PSM methods that the estimates of ATT are greater than the estimates of ATE. This implies that beneficiaries participating in the formal and semi-formal microfinance institutions achieve higher income as compared to those not participating in the indigenous system.

With respect to the value of household assets, the ATU represents the potential benefit of microfinance on non-beneficiaries' assets value. The values of ATU are GHS3798.117 (negative) in NNM and GHS3092.828 (Negative) in KM and it is statistically significant at 1% level in both methods. The results show that non-beneficiaries would have lost value of their asset by between of GHS3092.828 and GHS3798.117 if they were formal and semi-formal microfinance participants. The teffects in the ATE is negative and statistically significant at 10% level. The estimated value of GHS3349.153 further confirms the negative effect of being a beneficiary of both formal and semi-formal microfinance systems.

4.7.4 Robustness Tests for PSM based estimates

Here, results of covariate balancing tests and sensitivity analysis for assessing the quality of the matches and robustness of the results from the PSM based

estimates are presented. Results pertaining to formal versus indigenous systems are presented in Table 4.10. As shown, there is a reduction in bias as a consequence of matching. The estimates show that the standardised mean bias before matching is 32.2, while the standardised mean bias after matching is reduced to between 26.9 and 28.3. The percentage reduction in the absolute bias is 16.46% and 12.11% for the NNM and KM matching methods respectively.

Table 4. 10: Covariate balancing test and sensitivity analysis for formal versus indigenous systems

Matching algorithm	Matching status	Pseudo R^2	LR Chi^2	Mean bias	% bias reduction	Critical level of gamma
NNM	Before	0.459	152.59	32.2	16.46	2.3-2.4
	After	0.231	57.84	26.9		
KM	Before	0.459	152.59	32.2	12.11	2.4-2.5
	After	0.204	51.02	28.3		

Source: Field Survey, 2018

Since there has been reduction in bias under both matching methods, it is deduced that matching reduced selection bias under these matching methods. However, the level of reduction in bias is not significant.

From Table 4.10, it can be observed that the pseudo R^2 diagnostic statistic from the logit estimation of the conditional probabilities of participation indicates that the pseudo R^2 after matching is lower than before matching for all matching algorithms. This implies that there are no significant differences in the distribution of covariates between the participants and non-participants in the two microfinance systems after matching.

Furthermore, the results of the sensitivity analysis of hidden bias, which show the critical levels of gamma at which the causal inference of a significant impact of participation in formal microfinance system may be questioned, are presented in the last column of Table 4.9. Specifically, the value of gamma varies from 2.3 to 2.4 and 2.4 to 2.5 for income of beneficiaries for NNM and KM respectively. For instance, for the impact of participation in formal microfinance system on the value of beneficiaries' income, the critical value of gamma with NNM is between 2.3 and 2.4. This suggests that any unobserved variable would have to increase the odds ratio of participation by 130–140% before it would negate the estimated impact. Also, for the impact of participation in formal microfinance system on the income of beneficiaries, the critical value of gamma with KM is between 2.4 and 2.5. This suggests that any unobserved variable would have to increase the odds ratio of participation by 140–150% before it would negate the estimated impact. Based on the results of the sensitivity analysis, it is concluded that the estimated average treatment effects of participation in formal microfinance system on the income of beneficiaries remain robust even in the presence of unobserved heterogeneity. Thus, the CIA requirement for the PSM is again fulfilled.

Table 4.11 presents results pertaining to formal and semi-formal versus indigenous systems. The results show that there is a reduction in bias as a consequence of matching. The standardised mean bias before matching is 22.10 for the NNM and the KM, while the standardised mean bias after matching is reduced to 21.60 and 14.5 for the NNM and KM respectively. These reductions represent respectively 2.26% and 34.29% for the NNM and KM. Since the percentage reduction in bias under KM matching method is greater than 20%, a

value suggested by Rosenbaum & Rubin (1985) as sufficiently large enough reduction in standardised bias, it is deduced that matching substantially reduced selection bias under this matching method.

Table 4. 11: Covariate balancing test and sensitivity analysis for formal and semi-formal versus indigenous systems

Matching algorithm	Matching status	Pseudo R^2	LR Chi^2	Mean bias	% bias reduction	Critical level of gamma
NNM	Before	0.194	89.13	22.1	2.26	
	After	0.130	75.47	21.6		1.1-1.2
KM	Before	0.194	89.13	22.1	34.39	
	After	0.085	49.38	14.5		1.0-1.1

Source: Field Survey, 2018

The second diagnostic statistic employed is the Pseudo R^2 from the logit estimation of the conditional probabilities of participation. The results indicate that the Pseudo R^2 after matching is lower than before matching for all matching algorithms. This implies that there are no systematic differences in the distribution of covariates between the participants and non-participants in the two microfinance systems after matching. The predictors have extremely low or no explanatory power for assignment into treatment after matching. This suggests that there was no systematic difference in the distribution of covariates between participants and non-participants in the two microfinance systems after matching.

The results of the sensitivity analysis of hidden bias, which show the critical levels of gamma at which the causal inference of a significant impact of

participation in the two microfinance systems may be questioned, are also presented in the last column of Table 4.11. Since sensitivity analysis for insignificant effects is not meaningful, Rosenbaum bounds (rbounds) are calculated only for treatment effects that are significantly different from zero. The results show that robustness to hidden bias varies across different outcome variables. Specifically, the value of gamma varies from 1.1 to 1.2 and 1.0 to 1.1 for income of beneficiaries under NNM and KBM respectively. For instance, for the impact of participation in the two microfinance systems on the value of beneficiaries' income, the critical value of gamma with NNM is between 1.10 and 1.20. This suggests that any unobserved variable would have to increase the odds ratio of participation by 10–20% before it would negate the estimated impact. Based on the results of the sensitivity analysis, it is concluded that the estimated average treatment effects of participation in the two microfinance systems on the income of beneficiaries remain robust even in the presence of unobserved heterogeneity. Thus, the CIA requirement for the PSM was satisfied.

Since microfinance in general has a positive impact on income of beneficiaries, and since poverty is not purely about material conditions but also refers to other forms of deprivation such as social inferiority, powerlessness and isolation which are closely interlinked with each other as well as with income, it can be concluded that by having a positive impact on income of beneficiaries, microfinance systems have contributed to poverty reduction in the Upper West Region.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATION

5.1 Summary of Findings

5.1.1. Respect for Local Culture and Indigenous Support Systems

In the first place the study revealed that the Upper West region is endowed with various indigenous microfinance and support systems with some unfortunately suffering from a decline in their significance. The results indicate that the formal and semi-formal microfinance systems incorporate some indigenous microfinance traits in the delivering of their service and show respect for the culture of the people.

5.1.2. Summary on Comparative Analysis of the Determinants of Loan Amount

Estimated household income, the gender of the beneficiary, dependency ratio, years of education, access to microfinance information, and repayment period of current loan have a positive influence on the amount of loan accessed by beneficiaries. Hence increases in these variables will lead to an increase in the amount of loan contracted by beneficiaries. However, household size, number of persons in a group and interest rate on current loan were found to be negatively related to the amount of current loan contracted by the beneficiaries.

Distance is a significant determinant of the amount of loan in the indigenous microfinance system with a negative effect but has no effect on the amount of loan contracted from the formal and semi-formal microfinance systems.

Age of the beneficiary is a significant determinant of loan amount under indigenous microfinance system with positive effect. It, however, has no significant effect on the amount of loan contracted by beneficiaries under the semi-formal and indigenous microfinance systems.

Household size was found to be statistically significant with a negative influence on the amount of loan accessed from the formal microfinance system but not significant for semi-formal and indigenous microfinance systems.

Years of schooling of beneficiaries is significant and positively related to the amount of loan received by beneficiaries from the formal microfinance system. This was however not the case under the other two microfinance systems.

Surprisingly, the interest rate has a significant and positive effect on the amount of credit in semi-formal microfinance system but insignificant in the formal and indigenous microfinance systems.

Group size was found to be statistically significant and negative indicating that group size is a good predictor of determining the amount of loan in all the three microfinance systems. The negative relationship between group size and amount of credit implies that the larger the group size the smaller the amount of loan contracted from the three microfinance systems. However, the impact of group size was greater in the indigenous and semi-formal systems relative to the formal microfinance system. This may be likely due to the fact that both indigenous and

semi-formal microfinance systems are dominated by the group lending method which is less practiced under the formal microfinance system.

Estimated household income is found to have a positive influence on the amount of loan in all the three microfinance systems. Among these systems, estimated household income has greater significant influence in the indigenous system followed by the formal system and the least influence on the semi-formal system.

The repayment period of current loan is a statistically significant factor in determining the amount of loan in all the three microfinance systems and is positively related to the amount of loan.

5.1.3. Summary on Influence of Indigenous Microfinance System on Activities of Formal and Informal Microfinance Systems

Gender positively influences the amount of loan contracted by beneficiaries in the semi-formal system of microfinance but does not play a significant role in determining the amount of loan obtained from formal and indigenous microfinance systems.

Also, a group-based loan is positively related to the amount of credit in the indigenous sector. However, it was found not to be a significant determinant of the amount of loan accessed in the other microfinance systems.

Access to microfinance information is positively related to the amount of loan in the indigenous and semi-formal systems of microfinance but not in the formal microfinance systems. Access to microfinance information is observed to have

the higher influence on the amount of loan in the semi-formal system than in the indigenous system.

5.1.4. Summary on Determinants of Beneficiaries' Choice of Microfinance System for Loan.

Gender of beneficiaries was found to have a negative influence on their decision in accessing loans from the formal microfinance system but positive for accessing loans from the semi-formal microfinance system, relative to the indigenous systems. Thus, male beneficiaries depicted lesser probabilities of accessing loans from the formal microfinance system and higher probabilities of accessing loans from the semi-formal microfinance systems relative to indigenous system.

The study also reveals that bigger household size increases the probability of accessing loan from the formal microfinance systems but decreases the probability of accessing loans from the semi-formal microfinance systems relative to the indigenous microfinance systems.

It also reveals that interest charged by indigenous moneylenders was relatively higher in comparison with the other sources. Given the interest rate, beneficiaries had a higher probability of accessing loans from the formal microfinance system whose interest rate is comparatively the lowest among the three systems

The study further confirms the misery of the poor in accessing credit from the formal institutional sources. It was observed that households with higher income

had more probability of accessing credit from the formal microfinance system than those with lower income.

The effect of distance from the credit source on the choice of credit outlet was interesting. The higher the distance, the higher was the probability of accessing loans from the formal microfinance system.

The number of employed members in a household depicts a lower probability of obtaining loans from the formal microfinance system relative to indigenous microfinance system.

The time it takes for households to repay their current loan is also a significant factor influencing household's decision in selecting microfinance systems for loan.

As beneficiaries acquire more information or knowledge in the operations of microfinance, they are less likely to go in for loans from the semi-formal microfinance system relative to the indigenous microfinance system.

Beneficiaries whose main occupation is arable crop farming are less likely to access credit from the formal microfinance system as against indigenous microfinance system.

The study also reveals that, as beneficiaries gain more experience in borrowing, they are more likely to borrow from the formal microfinance system as compared to borrowing from the indigenous microfinance system.

It was observed that as the dependency ratio increases, households are more likely to choose semi-formal microfinance system to loan relative to indigenous

microfinance system and are less likely to access loan from the formal microfinance system relative to the base category.

Again, the study finds that as the number within a group increases, the probability that people will opt for loan from the semi-formal microfinance system increases compared to the indigenous microfinance systems.

Households in which children of school going age are many, are more likely to choose formal microfinance system compared to indigenous microfinance system type and are less likely to choose semi-formal microfinance system relative to an indigenous microfinance system.

5.1.5. Summary on Impact of Microfinance on Beneficiaries Households

The study indicates that participation in formal microfinance system has a significant positive impact on beneficiaries' income relative to participation in the indigenous microfinance system and participation in semi-formal microfinance system has a negative effect on household's asset value relative to the indigenous microfinance system. Comparatively, formal and semi-formal microfinance credit sources have more impact on beneficiaries and households relative to their indigenous counterparts in the region**.**

5.2 Conclusions

This study examined a comparative analysis of microfinance systems in the Upper West Region of Ghana. Based on the findings, the following conclusions are made.

The Upper West Region is endowed with numerous indigenous support systems that are used to assist community members in times of difficulty. Some of these support systems include support for fathers-in-law. However, this support system is under threat of extinction in recent times.

The formal and semi-formal microfinance systems operating in the Upper West Region have incorporated some indigenous microfinance arrangements into their operations and have respect for the culture of the people of the region.

The amount of loan accessed by beneficiaries is influenced by age of by estimated household income, the gender of the beneficiary, dependency ratio, years of education, access to microfinance information, and repayment period of current loan, household size, number of persons in a group and interest rate on current loan. However, these factors influence the three microfinance systems studied differently.

The PSM and teffects were used as the tools for estimating the impact of microfinance on households and beneficiaries. The study indicates that participation in microfinance system has a significant positive impact on that microfinance particularly formal and semi-formal microfinance systems have greater significant impact on households relative to the indigenous microfinance system in the Upper West Region.

5.3 Recommendations

The interest rates within the indigenous sector were realised to be very exorbitantly high. It is therefore recommended that provision of a stable, reliable

and reasonable credit delivery system by the Central Bank will help prevent the exploitation of beneficiaries by the indigenous microfinance institutions.

The study revealed that a number of indigenous support systems are on a downward trend in the region. In view of this, it is recommended that traditional authorities and the people of the Upper West Region particularly, the younger generation value and revamp these indigenous support system so as to reap their full benefits.

In view of the fact that group size has a negative significant effect on the amount of loan accessed by members, it is recommended that both clients and microfinance institutions that should adopt smaller groups when borrowing and lending respectively.

The study revealed that credit accessed from the formal and semi-formal microfinance institutions has a positive impact on the income of beneficiaries, accordingly, it is recommended that beneficiaries and potential clients should access loans from these sources.

It is also recommended that microfinance institutions should provide adequate information to beneficiaries and potential beneficiaries since access to information about microfinance institutions increases the amount of loans being received by beneficiaries.

Since the formal microfinance system emerged from the study as the system with the most impact on households in the Upper West Region, it is recommended that Government of Ghana through the Bank of Ghana establish

more Rural Banks in the rural areas of the country to make formal credit readily available to the people in these rural areas.

It is recommended that future research looks at the impact of the microfinance systems on poverty reduction directly in the region.

REFERENCES

Abiola, B. (2011). Impact analysis of microfinance in Nigeria. *International Journal of Economics and Finance*. 3(4): 217-225.

Adams, D.W., & Von Pischke, J. D. (1992). Microenterprise credit programmes. Deja vu *World Development* 20(10), 1463-1470.

Adams, S., & Bartholomew, T. A. (2010). The impact of microfinance on maize farmers in Nkoranza (Brong Ahafo Region of Ghana). *Journal of Management Research*, 2(2), 1-13.

Adams D, &Graham D.H. (1981). A Critique of traditional agricultural credit projects and policies. *Journal of Development Economics*, 8 (3), 347-366.

Addo, C. K. (2014). Overtrading versus lack of qualified staff as cause of failure of microfinance institutions in Ghana: A conceptual investigation. *Research Journal of Finance*, 2(11), 1-8

Adusei, M., & Appiah, S. (2012). Evidence on the impact of the 'susu' scheme in Ghana. *Global Journal of Business Research*, *6*(2), 1-10.

Ahiabor, G. (2013). The impact of microfinance on the development of small scale enterprises in the Ledzorkuku-Krowor municipality in the greater accra region of Ghana. *European Journal of Business and Management*, 5(7), 165-172.

Ahmad, N. (2011). Impact of institutional credit on agricultural output: A case study of Pakistan. *Theoretical and Applied Economics*, 10(563), 5-16.

Akudugu, M. A. (2012). Estimation of the determinants of credit demand by farmers and supply by rural banks in Ghana's Upper East Region. *Asian Journal of Agriculture and Rural Development*, 2(2), 189-200.

Alabi J., Alabi, G., & Ahiawodzi, A. (2007). Effects of "Susu" – traditional micro-finance mechanism on organised and unorganised micro and small enterprises (SMEs) in Ghana. *African Journal of Business Management,* 1(8), 201-208.

Alhassan, A., Li, L., Reddy, K., & Duppati, G. (2019). The impact of formal financial inclusion on informal financial intermediation and cash preference: evidence from Africa. *Applied Economics*, *51*(42), 4597-4614.

Al-Hassan, R., & Diao, X. (2007*).* Regional disparities in Ghana: Policy options and public investment implications. International Food Policy Research Institute, sustainable solutions for ending hunger and poverty. *IFPRI Discussion Paper No. 00693*. Washington D.C, USA.

Amidu, M. (2006). The link between monetary policy and banks lending behaviour: The Ghanaian case. *Banks and Bank Systems*, 1(4), 38-48.

Amin, S., Rai, A. S., & Topa, G. (2003). Does microcredit reach the poor and vulnerable? Evidence from northern Bangladesh. *Journal of development Economics*, 70(1), 59-82.

Amofa. M. B. (2018). Assessing the State of Microfinance Institutions in Takoradi. MBA Thesis, GTUC/Coventry University, UK

Amonoo, E., Acquah, P. K., & Asmah, E. E. (2003). The impact of interest rates on demand for credit and loan repayment by the poor and SMEs in Ghana. *IFLIP Research Paper*, 92(4), 2-11.

Anderson, C. L., Locker, L., & Nugent, R. (2002). Microcredit, social capital and common pool resources. *World Development*, 30(1), 95-105.

Anin, T. E. (2000). *Banking in Ghana*. Woeli Publishing Services, Accra.

Ansah, I. K., Toatoba, J., & Donkoh, S. A. (2016). The effect of credit constraints on crop yield: Evidence from soybean farmers in Northern Region of Ghana. *Ghana Journal of Science, Technology and Development*, *4*(1), 51-67.

Ansoglenang G. (2006). Rural Women and Micro-Credit Schemes: Cases from the Lawra District of Ghana. Master's Thesis, University of Tromso, Norway.

Anyanwu, J. C. (2011). International remittances and income inequality in Africa. *Review of Economic and Business Studies*, 4(1), 117–148.

Anyiro, C. O., & Oriaku, B. N. (2011). Access to and investment of formal micro credit by small holder farmers in Abia State, Nigeria. A case study of Absu micro finance bank, Uturu. *The Journal of Agricultural Sciences*, 6 (2), 69-76.

Armendariz de Aghion, B., & Morduch J. (2005). *The Economics of Microfinance*. MIT Press, Cambridge, Massachusetts, London.

Aryeetey, E. (1994). *Financial integration and development in Sub-Saharan Africa: A study of informal finance in Ghana*. Working Paper No.78. Overseas Development Institute, London.

Aryeetey, E. (2008). *From informal finance to formal finance in Sub-Saharan Africa: Lessons from linkage efforts.* Paper presented at the high level seminar on African finance for the 21st Century. IMF and Joint Africa Institute, Tunis, Tunisia, March 4–5.

Ashe, J., & Parrott, L. (2002). PACT's women's empowerment program in Nepal: A savings-and literacy-led alternative to financial building. *Journal of Microfinance*, *4*(2), 137-162.

Ashim, K. K. (2017). Income smoothing, capital management and provisioning behaviour of microfinance institutions: A Study using global panel data. *The European Journal of Development Research*, 29(1), 108-126.

Asiama, J. P., & Osei, V. (2007). *Microfinance in Ghana, an overview*. Economic Web Institute. Bank of Ghana, Accra, Ghana.

Awunyo-Vitor, D., & Abankwah, D. V. (2012). Substitutes or complements? Formal and informal credit demand by maize farmers in Ashanti and Brong Ahafo Regions of Ghana. *International Journal of Agriculture and Forestry*, 2(3), 105-112.

Ayaz, S., & Hussain, Z. (2011). Impact of institutional credit on production efficiency of farming sector: A case study of District Faisalabad. *Pakistan Economic and Social Review*, 49(2), 149-162.

Baiyegunhi, L. J. S., Fraser, G. C. G., & Darroch, M. A. G. (2010). Credit constraints and household welfare in the Eastern Cape Province, South Africa. *African Journal of Agricultural Research*, 5(16), 2243-2252.

Balogun, O. L., & Yusuf, S. A. (2011). Determinants of demand for microcredit among the rural households in South-Western States, Nigeria. *Journal of Agriculture & Social Sciences*, 7(2), 41-48.

BIS (2010). *Microfinance activities and the core principles for effective banking supervision.* Bank for International Settlements, Basel, Switzerland.

Bank of Ghana (2007). *A Note on microfinance in Ghana.* Working Paper No. WP/BOG-2007/01. Bank of Ghana Research Department, Accra, Ghana.

Bank of Ghana (2017). Credit Referencing Activity Annual Report. Bank of Ghana, Accra, Ghana.

Bank of Ghana (2018). Banking Sector Report. Bank of Ghana, Accra, Ghana.

Barnes, C., & Sebstad, J. (2000). *Guidelines for Microfinance Impact Assessments*. Management Systems International, Washington, D.C.

Barslund, M. & Tarp, F. (2008). Formal and informal rural Credit in four provinces of Vietnam. *Journal of Development Studies*, 44(4), 485-503.

Bendig, M., Giesbert, L., & Steiner, S. (2009). *Savings, credit and insurance: Household demand for formal financial services in rural Ghana.* German Institute of Global and Area Studies, Research Programme: GIGA working paper No. 94. Hamburg, Germany.

Boateng, G. O., Boateng, A. A., & Bampoe, H. S. (2015). Microfinance and poverty reduction in Ghana: Evidence from policy beneficiaries. *Review of Business & Finance Studies,* 6(1*),* 99-108.

Boateng, F. G., Nortey, S., Asamanin Barnie, J., Dwumah, P., Acheampong, M., & Ackom-Sampene, E. (2016). Collapsing microfinance institutions in Ghana: an account of how four expanded and imploded in the Ashanti region. *International Journal of African Development*, *3*(2), 37-62.

Botchway, K. (2001). Paradox of empowerment: reflections on a case study from Northern Ghana. *World Development*, 29(1), 135-153.

Cameron, A. C., & Trivedi, P. K. (2005). *Microeconometric Methods and Applications*. Cambridge University Press, New York, USA.

Chowdhury, A. M. R., & Bhuiya, A. (2001). DO poverty alleviation programmes reduce inequities in health: the Bangladesh experience. In*:* Leon DA &Walt G (Eds.*),* *Poverty, Inequality, and Health: An International Perspective*. Oxford University Press, Oxford, 312-332.

Chowdhury, A. M. R., Mahmud, M., & Abed, F. H. (1991). Credit for the rural poor - the case of BRAC in Bangladesh. *Small Enterprise Development*, 2(3), 4-13.

Chowdhury, M. J. A. (2004). *Poverty and Microfinance in the Philippines*. University of Dhaka, Bangladesh.

Christen, R. P. (1997). *Banking Services for The Poor: Managing for Financial Success: An Expanded and Revised Guidebook for Development Finance Institutions*. Acción International, Boston, USA.

Coleman, B. (2006). Microfinance in North East Thailand: who benefits and how much? *World Development*, 34(9), 1612-1638.

Connell, J. P., & Kubisch, A. C. (1998). Applying a theory of change approach to the evaluation of comprehensive community initiatives: progress, prospects, and problems. *New approaches to evaluating community initiatives*, *2*(15-44), 1-16.

Dunn, E. (2005). *Impact of Microfinance on Clients in Bosnia and Herzegovina. Foundation for Sustainable Development of the Federation of Bosnia and Herzegovina and Republika Srpska. Development and Employment Foundation*, Bosnia and Herzegovina

Egyir I. S. (2010). Rural women and Microfinance in Ghana: Challenges and Prospects. Contributed Paper Presented at the Joint 3rd African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa, September 19-23.

Etonihu, K., Rahman, S. A., & Usman, S. (2013). Determinants of access to agricultural credit among crop farmers in a farming community of Nasarawa State, Nigeria. *Journal of Development and Agricultural Economics*, 5(5), 192-196.

Fridell M. (2007). Exploring the roles of informal, formal and semiformal microcredit in Jordan. B.Sc. Thesis, Lund University, Sweden.

Gallardo, J. (2002). *A framework for regulating microfinance institutions: The experience in Ghana and the Philippines.* Research working paper series; No. WPS 2755. World Bank, Washington, DC

Gheneti Y. (2007). Microcredit management in Ghana: Development of co-operative credit unions among the Dagaaba, Doctoral Dissertation, Leiden University, Leiden, The Netherlands.

Grameen Bank (2000). *Microfinance-credit Lending Models.* Grameen Bank, Bangladesh.

Greene, W. H. (2003). *Econometric Analysis* (4th ed.). Pearson Education, Inc., Upper Saddle River, New Jersey, USA.

GSS. (2012). *2010 Population and Housing Census.* Ghana Statistical Service, Accra, Ghana.

Gulli, H. (1998). *Microfinance and Poverty: Questioning the Conventional Wisdom.* Inter-American Development Bank, New York, USA.

Harper, M. (1998). *Profit for the Poor, Cases in Micro-Finance*. Intermediate Technology Publications, London, UK.

Harper, M. (2002). Self-help Groups and Grameen Bank groups: What are the Differences? In: Fisher T. & M.S. Sriram (Eds.), *Beyond Micro-credit: Putting Development Back into Micro-finance*. Vistaar publications, New Delhi, India, 169-198.

Harper, M., & Vogel, R. (2005). The Role of Savings as a form of MFI Funding: Debate. *Micro Banking Bulletin, Issue 11, (August*, 5-9).

Hartarska, V. & Nadolnyak, D. (2008). An impact analysis of microfinance in Bosnia and Herzegovina. *World Development*, 36(12), 2605-2619.

Hashemi, S., Schuler, R., & Riley, A. (1996). Rural credit programmes and women's empowerment in Bangladesh. *World Development* 24(4), 635-653.

Heinrich, C., Maffioli, A., & Vazquez, G. (2010). A primer for applying propensity-score matching. Inter-American Development Bank, Technical Notes No. IDB-TN-161

Henri-Ukoha, A., Orebiyi, J. S., Obasi, P. C., Oguoma, N. N., Ohajianya, D. O., Ibekwe, U. C. & Ukoha I. I. (2011). determinants of loan acquisition from the financial institutions by small-scale farmers in ohafia agricultural zone of Abia state, South East Nigeria. *Journal of Development and Agricultural Economics*, 3(2), 69-74.

Hoque, S. (2008). Does micro-credit programme in Bangladesh increase household's ability to deal with economic hardships? Munich Repack Personal Archive Paper No. 6678. Retrieved from http://mpra.ub.uni-muenchen.de/6678/

Hossain, M. (1988). Credit for Alleviation of Rural Poverty: The Grameen Bank in Bangladesh. International Food Policy Research Report No. 65, International Food Policy Research Institute, Washington DC, USA.

Hulme, D., & Mosley, P. (1996). *Finance against poverty*. Routledge, London, UK.

Hussien, H. (2007). Farm Household Economic Behaviour in Imperfect Financial Markets, Doctoral Thesis, Uppsala, Swedish University of Agricultural Sciences, Sweden.

Ijaiya, M. A. (2011). Informal microfinance and economic activities of rural dwellers in Kwara South Senatorial District of Nigeria. *International Journal of Business and Social Science*, 2(15), 136-146.

Ijioma, J. C., & Osondu, C. K. (2015). Agricultural credit sources and determinants of credit acquisition by farmers in Idemili Local Government Area of Anambra State. *Journal of Agriculture Science and Technology*, 5(1), 34-43.

Ikechukwu, A. (2012). Microfinance banking in Nigeria: Problems and prospects. *International Journal of Finance and Accounting*, 1(5), 106-111.

Issahaku, H., Abu, B. M., & Nkegbe, P. K. (2018). Does the use of mobile phones by smallholder maize farmers affect productivity in Ghana? *Journal of African Business*, 19(3), 302-322.

Javed, A., Luqman, M., Khan, A. S., & Farah, A. A. (2006). Impact of Micro-credit Scheme of NRSP on the Socio-economic Conditions of Female Community in District Rawalakot, Azad Jamu and Kashmir, Pakistan. *Journal of Agriculture and Social Sciences*, 2(3), 141-144.

Jesse, D. L. (2010). New Approaches to Evaluation: Comparative Impact Assessment. *Journal of Civil Society and Social Transformation*, 1, 26-37.

Kamal, A. (1996). Poor and the NGO Process: Adjustments and Complicities. In: Rahman H. Z., M. Hossain & B. Sen (Eds.), *Dynamics of Rural Poverty in Bangladesh.* Bangladesh Institute of Development Studies, Bangladesh.

Kedir, A. (2003). Determinants of access to credit and loan amount: Household-level evidence from urban Ethiopia. International Conference on Development Studies in Eutopia, Addis Ababa, Ethiopia, July 11-12.

Khan, A. (2008). Tackling the failure of microfinance efforts through amalgamating microfinance with charity: two viable alternatives in the context of Pakistan. *Australasian Accounting, Business and Finance Journal*, 2(2), *19-33.*

Khan, M. A., & Rahaman, M. A. (2007). Impacts of Microfinance on Living Standards, Empowerment, and Poverty Alleviation and Poor People: Case Study on Microfinance in the Chittagong District of Bangladesh, Masters Thesis, Umea School of Business (USBE), Bangladesh.

Khandkr, S.R., Koolwal, G, B. & Samad (2010). *Handbook on Impact Evaluation: Quantitative Methods and Practices.* World Bank, Washington DC, USA.

Khandker, S. R., Samad, H. A., & Khan, Z. H. (1998). Income and employment effects of micro-credit programmes: Village-level evidence from Bangladesh. *The Journal of Development Studies*, 35(2), 96-124.

Khandker, S. R. (2005). Microfinance and poverty: Evidence using panel data from Bangladesh. *The World Bank Economic Review*, 19(2), 263-286.

Khawari A. (2004). Microfinance: Does it hold its promises? A survey of recent literature. HWWA Discussion Paper No. 276. Homburg Institute of International Economics, Homberg, Germany.

Kiiru M. J., Mbuttu, J. & Flohberg, K. (2007). Does Participations in Microfinance Programmes Improve Household's Incomes: Empirical Evidence from Makueni District, Kenya. AAAE conference proceedings, Bonn- Germany: Centre for Development Research, Bonn University, Bonn, Germany, 405-410.

Kilic, T., Serajuddin, U., Uematsu, H. &Yoshida, N. (2017). Costing Household Surveys for Monitoring Progress Toward Ending Extreme Poverty and Boosting Shared Prosperity. World Bank Policy Research Paper no. 7951, World Bank, Washington, DC, USA.

Kiriti W. (2007). *Micro-finance and Poverty Alleviation: How Effective is it in Alleviating Gender Poverty? Poverty, Poverty Alleviation and Social Disadvantage: Analysis, Case Studies and Policies.* Serials Publications, New Delhi, India.

Kotir, J. H., & Obeng-Odoom, F. (2009). Microfinance and rural development: A Ghanaian perspective. *Journal of Developing Societies*, 25(1), 85-105.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), 607-610.

Latifee, H. I. (2003). Microfinance and poverty reduction. Paper presented at an international conference on Poverty Reduction through Microcredit, Taksim-Istanbul, Turkey. June 9-10.

Lawra District Assembly (2010). Medium Term Development Plan, (2010-2013). Lawra, Ghana.

Lecy J. D. (2010). New *Approaches to Evaluation: Comparative Impact Assesement* (Vol.1). Social Sciences and Traditional NGO Initiative, Moyniban Institute of Global Affairs, The Maxwell School of University, New York, USA.

Ledgerwood, J. (1999). *Microfinance Handbook: An Institutional and Financial Perspective.* World Bank, Washington DC, USA.

Littlefield, E., Murduch, J., & Hashemi, S. (2003). Is microfinance an effective strategy to reach the Millennium Development Goals? ADBI Discussion Paper No. 104. CGAP, Washington, DC, USA.

Littlefield, E., & Rosenberg, R. (2004). Microfinance and the poor. *Finance and Development*, 41(2), 38-40.

Ma-Azu, A. J. (2015). Determinants of access to credit and its impact on household food security in Karaga district of the Northern region of Ghana. M.Phil. Thesis, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Maes, J. & Basu, M. (2005). Building economic self-reliance: Trickle up's microenterprise seed capital for the extreme poor in rural India. *Journal of Microfinance*, 7(2), 71-99.

Maldonado, J. H. & Gonzales-Vega, C. (2008). Impact of microfinance on schooling: Evidence from poor rural households in Bolivia. *World Development*, 36(11), 2440-2455.

Malhotra, A., Schuler, S. R. & Boender, C. (2002). *Measuring Women's Empowerment as a Variable in International Development.* Background Paper prepared for the World Bank Workshop on Poverty and Gender, World Bank, Washington, DC. USA.

Mallick, R. (2002). Implementing and evaluating microcredit in Bangladesh. *Development in Practice*, 12(2), 153-163.

Mayoux L. (1999). Questioning virtuous spirals: microfinance and women's empowerment in Africa. *Journal of International Development*, 11(7), 957-984.

Mayoux L. (2001). *Women's Empowerment and Poverty Reduction: Impact Assessment of Microfiance*. Enterprise Development Impact Assessment Information Services (EDIAIS), Department for International Development (DFID), London, UK.

McKernan, S. M. (2002). The impact of microcredit programs on self-employment profits: Do noncredit program aspects matter? *Review of economics and statistics*, *84*(1), 93-115.

Mersland, R., & Strom, R. O. (2009). Performance and governance in microfinance institutions. *Journal of Banking & Finance*, *33*(4), 662-669.

Meyer, R. (2002). Track record of financial institutions assisting the poor in Asia. ADB Institute Research Paper No. 49. Manila, Philippines.

Mishra, B & Nayak P. (2004). Limits of micro-credit for rural development: a cursory look. In: Gogoi J. K. (ed.). *Rural Indebtedness in North East India*, Dibrugarh University, Assam, India, 185-200.

MkNelly, B., & Dunford, C. (1998). Impact of credit with education on mothers and their young children's nutrition: Lower Pra Rural Bank Credit with Education Programmes in Ghana. Research paper No. 4. Freedom from Hunger. Davis, USA.

Morduch, J. (1999). The microfinance promise. *Journal of Economic Literature*, 37(4), 1569 -1614.

Morduch, J. (2000). The microfinance schism. *World Development*, 28(4), 617 – 629.

Mosley, P. (1996). India: The regional rural banks. In: Hulme D. & P Mosley. (Eds.), *Finance against Poverty*. London: Routledge, London UK.

Mosley, P. (1999). Microfinance and Poverty: Bolivia Case Study. Unpublished background paper for 2000/01, World Development Report.

Mosley, P. (2001). Microfinance and poverty in Bolivia. *Journal of development studies*, *37*(4), 101-132.

Mpuga, P. (2010). Constraints in access to and demand for rural credit: Evidence from Uganda. *African Development Review*, *22*(1), 115-148.

Muiruri, P. M. (2014). The Role of Micro-Finance Institutions to the Growth of Micro and Small Enterprises (MSE) in Thika, Kenya (Empirical Review of Non-Financial Factors). *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *4*(4), 249-262.

Murray U. & Boros, R. (2002). *A Guide to Gender-Sensitive Microfinance*. Socio-Economic and Gender Gnalysis (SEAGA) Programme, FAO, Rome, Italy.

Mustafa, S., Ara, I., Banu, D., Kabir, A., Mohsin, M., Yusuf, A. & Jahan, S. (1996). Beacon of Hope: *An Impact Assessment Study of BRAC's Rural Development Programme*. Research and Evaluation Division, BRAC, Dhaka, Bangladesh.

Nimoh, F., Kwasi, A., & Tham-Agyekum, E. K. (2011). Effect of formal credit on the performance of the poultry industry: The case of urban and peri-urban Kumasi in the Ashanti Region. *Journal of Development and Agricultural Economics*, 3(6), 236-240.

Nwaru, J. C., Essien, U. A., & Onuoha, R. E. (2011). Determinants of indigenous credit demand and supply among food crop farmers in Akwa Ibom State, Nigeria. *Journal of Rural and Community Development,* 6(1), 129–139.

Okurut, F. N., Banga, M., & Mukungu, A. (2004). *Microfinance and poverty reduction in Uganda: Achievements and challenges*. Research Series No. 41, Economic Policy Research Centre, Makerere University, Kampala, Uganda.

Okurut, F. N., Schoombee, A., & Van der Berg, S. (2005). Credit demand and credit rationing in the informal financial sector in Uganda. *South African Journal of Economics*, 73(3), 482-497.

Opoku Antwi, B. (2016). *The Failure of Microfinance in Ghana: A Case Study of Noble Dream Microfinance Limited.* Doctoral Dissertation, KNUST, Kumasi, Ghana.

Otero, M. (1999). Bringing developments back into microfinance. *Journal of Microfinance*, 28(4), 8-19.

Owusu-Antwi, G., & Antwi, J. (2010). The analysis of the rural credit market in Ghana. Inter*national Business and Economics Research Journal*, 9 (8), 45-56.

Owusu-Nuamah, P. (February 14, 2014). *Collapse of microfinance companies: Companies shot themselves in the foot.* Retrieved from GhanaWeb.com, June, 3, 2018.

Panda, K. D. (2009). Participation in the group gased microfinance and its impact on rural households: A Quasi experimental evidence from an Indian state. *Global Journal of Finance and Management*, 1(2), 171-183.

Panjaitan-Drioadisuryo, R. D. M., & Cloud, K. (1999). Gender, Self-Employment and Microcredit Programmes: An Indonesian Case Study. *The Quarterly Review of Economics and Finance*, 39(5), 769–779.

Petrick, M. (2002,). Credit rationing in the polish farm sector: A microeconometric Analysis Based on Survey Data. Paper presented at the Xth European Association of Agricultural Economists. EAAE Congress Exploring Diversity in the European Agri -Food System. Zaragoza Spain, August 28-31.

Pitt, M. M., & Khandker, S. R. (1998). The impact of group-based credit programs on poor households in Bangladesh: Does the gender of participants matter? *Journal of Political Economy*, 106(5), 958-996.

Pitt, M. M., & Khandker, S. R. (2002). Credit programmes for the poor and seasonality in rural Bangladesh. *Journal of Development Studies*, 39(2), 1-24.

Pitt, M. M., Khandker, S. R. & Cartwright, J. (2006). Empowering women with microcredit: Evidence from Bangladesh. *Economic Development and Cultural Change*, 54(4), 791-831.

Pronyk, P., Hargreaves, J., & Murdoch, J. (2007). Microfinance programmes and better health: Prospects for Sub Saharan Africa. *Journal of American Medical Association*, 29(16), 1925-1927.

Quainoo, A. A. (1997). A Strategy for Poverty Reduction through Micro-finance: Experience, Capacities and Prospects. Draft report of a study commissioned by Government of Ghana, UNDP, African Development Bank, World Bank, Accra, Ghana.

Quinones, B., & Remenyi, J. (eds.), (2014). *Microfinance and poverty alleviation: Case Studies from Asia and the Pacific*. Routledge, London, UK.

Rahji, M. A. Y., & Fakayode, S. B. (2009). A multinomial logit analysis of agricultural credit rationing by commercial banks in Nigeria. *International Research Journal of Finance and Economics*, 24(91), 97-103.

Ramkumar R., Supriyo R. & Kaushik K. (2015). Role of microfinance for improving quality of life by providing financial services tolLow-income group: A critical review. *International Journal of Applied Engineering Research*, 10(55), 4136-4142.

Rao, V., & Ibanez, A. M. (2005). The social impact of social funds in Jamaica: A 'participatory econometric 'analysis of targeting, collective action, and participation in community-driven development. *Journal of Development Studies*, 41(5), 788-838.

Remenyi, J. (2002). Microfinance: A tool for poverty reduction, Sri Lanka. *Journal of Agrarian Studies*, 10 (1), 52-69.

Richardson, D.C. (2003). Going to the barricades for microsavings mobilization: A view of the real costs from the trenches. Microbanking Bulletin, Issue No. 9, July 9-13.

Robinson, M. (2001). *The Microfinance Revolution: Sustainable Finance for the Poo*r. World Bank, Washington DC, USA.

Roth, J. (1997). *The limits of micro credit as a rural development intervention*- M.A. Dissertation, Manchester University, Manchester UK.

Rutherford, S. (2000). *The Poor and their Money*. Oxford University Press, New Delhi, India.

Schreiner, M., & Colombet, H. H. (2001). From urban to rural: Lessons for microfinance from Argentina. *Development Policy Review,* 19(3), 339-354.

Schreiner, M., & Colombet, H. H. (2001). Microfinance, regulation, and uncollateralised loans to small producers in Argentina. In: Douglas R. S., T. Buss, & G. Woller (eds.), *Microcredit and Development Policy*. Nova Science Publishers, Huntington, NY, USA. 137–152.

Sebstad, J., & Walsh, M. (1991). Microenterprise credit and its effects in Kenya: An exploratory study. Report prepared for USAID AFR/MDI and S&T/WID, Coopers and Lybrand, Washington, DC, USA.

Sekyi, S. (2017). Rural Households' Credit access and loan amount in Wa municipality, Ghana. *International Journal of Economics and Financial Issues*, 7(1), 506-514.

Sharma, M. (2000). Impact of Microfinance on poverty alleviation: What does emerging evidence indicate? IFPRI Policy brief 2, Rural Financial Policies for Food Security of the Poor. International Food Policy Research Institute, Washington DC, USA.

Simanowitz, A. (2003). Appraising the poverty outreach of microfinance: A review of the CGAP poverty assessment tool. Imp-Act occasional paper No.1. Institute of Development Studies, University of Sussex, Brighton, UK.

Simanowitz, A., & Waters, A. (2002). Ensuring impact: Reaching the poorest while building financially self-sufficient institutions, and showing improvement in the lives of the poorest women and their families. In: Sam Daley-Harris S. (ed.), *Pathways out of Poverty: Innovations in Microfinance for the Poorest Families*. Kumarian Press, Inc. Bloomfield, Connecticut, USA, 1-74.

Sissala East District Assembly (2010). Medium Term Development Plan (2010-2013). Tumu, Ghana.

Siwale, J. & Ritchie, J. (2011). Failure by Design: The Rise and Fall of a Micro-finance Institution in Zambia – A Case of Pride Zambia. http://eprints.lincoln.ac.uk/5865/2/15B.Siwale.format.pdf.

Srinivas, H. (2015). Microfinance-credit lending models. *GDRC Research Output No. E-059.* Global Development Research Center, *Kobe, Japan.*

Steel, W. F., & Andah, D. O. (2008). Rural and micro finance regulation in Ghana: implications for development and performance of the industry. In: Aryeetey E. & R. Kanbur (eds.), *The economy of Ghana: Analytical perspectives on stability, growth and poverty.* Woeli Publishing Services and James Currey, Accra, Ghana.

Sutoro, A. D. (1990). KUPEDES Development Impact Survey: BRI Briefing Booklet, Planning, Research, and Development Department, Jakarta, Indonesia.

Swain, R. B., & Floro, M. (2007). *Effect of microfinance on vulnerability, poverty and risk in low income households*. Working Paper No. 2007:31. Uppsala University, Sweden.

Tang, S., Guan, Z., & Jin, S. (2010). Formal *and informal credit markets and rural* credit demand in China. Paper presented at the Agricultural and Applied Economics Association AAEA, CAES, and WAEA Joint Annual Meeting, Denver, Colorado, USA, July 25-27.

Tanveer, H. (2012). Factors influencing demand for credit from formal and informal sources in Gujranwala District, Pakistan- A case of commercial banks and arties. Master's thesis. Norwegian University of Life Sciences (UMB), Norway.

Togba, E. L. (2012), Microfinance, social capital and households access to credit: Evidence from Côte d'Ivoire. *Structural Change and Economic Dynamics,* 23(4), 473-486.

Tuffour, J. A. (2002). Forging linkages between formal and informal financial sectors: emerging practices in Ghana. *African Finance Journal*, 4(1), 1-31.

Vaessen, J., Rivas, A., Duvendack, M., Palmer Jones, R., Leeuw, F., Van Gils, G. Lukach R., Holvoet N., Bastiaensen J., Hombrados J.G. & Waddington, H. (2014). The effects of microcredit on women's control over household spending in developing countries: A systematic review and meta-analysis. *Campbell Systematic Reviews*, No. 2014:8. The Campbell Collaboration, Oslo, Norway.

Vathsala, W., & Fernando, D. (2017). Use of microcredit for household income and consumption smoothing by low income communities. *International Journal of Consumer Studies*, 41(6), 647-658.

Volschenk, J., Fish, T., & Mukama, J. (2005). Problems affecting the growth of microfinance institutions in Tanzania. *African Finance Journal*, 7(2), 42-63.

Wa Municipal Assembly, (2010). Medium Term Development Plan (2010-2013). Wa, Ghana.

Waheed, S. (2009). Does rural micro credit improve well-being of borrowers in the Punjab (Pakistan)? *Pakistan Economic and Social Review*, 47(1), 31-47.

Wainaina, P. W., Okello, J. J., & Nzuma, J. (2012). Impact of Contract Farming on Smallholder Poultry Farmers' Income in Kenya. Paper Presented at the International Association of Agricultural Economists (IAAE) Triennial Conference, Fozdo Iguaçu, Brazil, August 18-24.

Wehrell, R., Campbell, M., Cunningham, G., & Lee, N. (2002). The Atlantic micro-credit socio-economic impact study final report. Steering Committee to Coordinate Research on Microcredit in Atlantic Canada, Antigonish, Canada.

White, H. (2009). Theory-based impact evaluation: principles and practice. *Journal of Development Effectiveness*, 1(3), 271-284.

Zaman, H. (2000). Assessing the poverty and vulnerability impact of Micro-credit in Bangladesh: A Case Study of BRAC. Background paper for the WDR 2000/10. World Bank, Washington, D.C, USA.

Zeller, M. (1994). Determinants of credit rationing: A Study of Informal Lenders and Formal Credit Groups in Madagascar. FCND Discussion Paper No. 2, International Food Policy Research Institute, Washington DC, USA.

Zeller, M., Sharma, M., Ahmed, A., & Shahidur, R. (2001). Group-based financial institutions for the rural poor in Bangladesh: An institutional and household-level analysis. IFPRI Research Report No. 120. International Food Policy Research Institute, Washington DC, USA.

Zeller. M. (1999). Towards enhancing the role of microfinance for safety nets of the Poor. ZEF Discussion Papers on Development Policy No. 19, University of Bonn, Bonn, Germany.

APPENDICES

Appendix 1: Results of Determinants of Loan Amount (Overall).

```
/* Determinants of loan amount (Overall) */
. reg lLAMT lDIST Belong lHHINC lAGE GEN lHSIZE DR lYears_edu /*Grp_Loan*/ lNumber
MFINFO lEXP lIR lREPP, vce(robust)

Linear regression                               Number of obs     =        360
                                                F(13, 346)        =      16.70
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3689
                                                Root MSE          =      .9369

------------------------------------------------------------------------------
             |               Robust
       lLAMT |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lDIST |    .174189   .0766441     2.27   0.024      .023442     .324936
      Belong |   .1470894   .1162492     1.27   0.207    -.0815547    .3757335
      lHHINC |   .4038212   .0828398     4.87   0.000     .2408883    .5667541
        lAGE |  -.5266606   .2211029    -2.38   0.018    -.9615355   -.0917857
         GEN |   .4446244   .1131511     3.93   0.000     .2220739     .667175
      lHSIZE |   -.880547   .2078889    -4.24   0.000    -1.289432    -.471662
          DR |   .2541314   .0854906     2.97   0.003     .0859847    .4222781
  lYears_edu |   .1525054   .0495761     3.08   0.002      .054997    .2500139
     lNumber |  -.2163307   .0546195    -3.96   0.000    -.3237586   -.1089028
      MFINFO |   .9321211   .2394743     3.89   0.000     .4611125     1.40313
        lEXP |  -.2539407   .1715858    -1.48   0.140    -.5914232    .0835418
         lIR |  -.1977931   .1142184    -1.73   0.084    -.4224429    .0268567
       lREPP |   .8972024   .1194418     7.51   0.000     .6622789    1.132126
       _cons |   4.752649   1.256965     3.78   0.000     2.280396    7.224903
------------------------------------------------------------------------------
```

Appendix 2: Results of Determinants of Loan Amount (Indigenous).

```
. /* Determinants of loan amount (Indigenous) */
. reg lLAMT lDIST Belong lHHINC lAGE GEN lHSIZE DR lYears_edu /*Grp_Loan*/ lNumber
MFINFO lEXP lIR lREPP if Institute_Type==0, vce(robust)

Linear regression                               Number of obs     =        120
                                                F(13, 106)        =      21.77
                                                Prob > F          =     0.0000
                                                R-squared         =     0.6204
                                                Root MSE          =     .75039

------------------------------------------------------------------------------
             |               Robust
       lLAMT |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lDIST |  -.3768013   .0993667    -3.79   0.000    -.5738053   -.1797972
      Belong |   .8457142   .2975702     2.84   0.005     .2557524    1.435676
      lHHINC |   .4476725   .1137321     3.94   0.000     .2221875    .6731575
        lAGE |  -.7121095   .3709496    -1.92   0.058    -1.447553    .0233343
         GEN |   .0930381   .1928508     0.48   0.630    -.2893073    .4753835
      lHSIZE |   .0219668   .3587326     0.06   0.951    -.6892554    .7331889
          DR |  -.0662019   .1418904    -0.47   0.642    -.3475134    .2151096
  lYears_edu |  -.0428211   .0791308    -0.54   0.590    -.1997055    .1140633
     lNumber |  -.0530994   .0815689    -0.65   0.516    -.2148177    .1086189
      MFINFO |   1.141459   .3244356     3.52   0.001     .4982342    1.784685
        lEXP |  -1.058751   .6098363    -1.74   0.085    -2.267811    .1503089
         lIR |   .3346271   .4891937     0.68   0.495     -.635247    1.304501
       lREPP |    1.00521   .1244016     8.08   0.000     .7585715    1.251848
       _cons |   1.738228   2.448288     0.71   0.479    -3.115741    6.592197
------------------------------------------------------------------------------
```

Appendix 3: Results of Determinants of Loan Amount (Formal).

```
. /* Determinants of loan amount (Formal) */
. reg lLAMT lDIST Belong lHHINC lAGE GEN lHSIZE DR lYears_edu /*Grp_Loan*/ lNumber
MFINFO lEXP lIR lREPP if Institute_Type==1, vce(robust)

Linear regression                               Number of obs     =        120
                                                F(13, 106)        =       7.32
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3627
                                                Root MSE          =     .96992

------------------------------------------------------------------------------
             |               Robust
       lLAMT |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lDIST |   .1535946   .1691833     0.91   0.366    -.1818277    .4890169
      Belong |   -.230142   .2353525    -0.98   0.330    -.6967512    .2364671
      lHHINC |   .4338896   .1747645     2.48   0.015     .0874019    .7803772
        lAGE |   .4268588   .3697652     1.15   0.251    -.3062366    1.159954
         GEN |   .0479509   .2223192     0.22   0.830    -.3928186    .4887205
       lHSIZE |  -1.230972   .4419413    -2.79   0.006    -2.107163     -.35478
          DR |   .3880842   .2121811     1.83   0.070    -.0325855    .8087538
  lYears_edu |   .2183289   .0900577     2.42   0.017     .0397808     .396877
     lNumber |  -.4228517   .2690505    -1.57   0.119    -.9562704     .110567
      MFINFO |   .4739181   .6299284     0.75   0.454    -.7749761    1.722812
        lEXP |  -.5203893   .2872293    -1.81   0.073    -1.089849    .0490707
         lIR |   2.558103   3.864924     0.66   0.509    -5.104485    10.22069
       lREPP |    .464727   .4250558     1.09   0.277    -.3779874    1.307441
       _cons |  -6.105584   13.42101    -0.45   0.650    -32.71403    20.50287
------------------------------------------------------------------------------
```

Appendix 4: Results of Determinants of Loan Amount (Semi-Formal).

```
.
. /* Determinants of loan amount (Semi-formal) */
. reg lLAMT lDIST Belong lHHINC lAGE GEN lHSIZE DR lYears_edu /*Grp_Loan*/ lNumber
MFINFO lEXP lIR lREPP if Institute_Type==2, vce(robust)

Linear regression                               Number of obs     =        120
                                                F(13, 106)        =      14.22
                                                Prob > F          =     0.0000
                                                R-squared         =     0.5946
                                                Root MSE          =     .78276

------------------------------------------------------------------------------
             |               Robust
       lLAMT |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lDIST |    .112197   .1073831     1.04   0.298    -.1007005    .3250945
      Belong |  -.1160053   .2526448    -0.46   0.647    -.6168982    .3848875
      lHHINC |   .3318977   .1421881     2.33   0.021     .0499959    .6137994
        lAGE |  -.9707918    .399294    -2.43   0.017    -1.762431   -.1791526
         GEN |   .5743985   .1913338     3.00   0.003     .1950607    .9537363
       lHSIZE |  -.6510423   .2935592    -2.22   0.029    -1.233052   -.0690325
          DR |   .1649621   .1248759     1.32   0.189    -.0826166    .4125407
  lYears_edu |   .1307373   .0779993     1.68   0.097     -.023904    .2853785
     lNumber |  -.4628451   .1341793    -3.45   0.001    -.7288685   -.1968216
      MFINFO |   1.478319   .3902128     3.79   0.000     .7046841    2.251954
        lEXP |  -.4077525   .2888136    -1.41   0.161    -.9803535    .1648486
         lIR |   2.598477   1.323355     1.96   0.052     -.025204    5.222157
       lREPP |   .8977653   .1979526     4.54   0.000     .5053051    1.290226
       _cons |  -2.959258   5.168813    -0.57   0.568    -13.20693    7.288415
------------------------------------------------------------------------------
```


Appendix 5. Results of Multinomial Probit Estimation

```
mprobit Institute_Type GEN AGE POCC LIVEHD HSIZE DR EDU NCHLD Number REPP
Interest MFINFO EXP LAMT COL DIST ASET Employed No_children Income_Head
Income_mem1 HHINC


Iteration 0:   log likelihood = -192.93151
Iteration 1:   log likelihood = -188.98871
Iteration 2:   log likelihood = -188.96495
Iteration 3:   log likelihood = -188.96494

Multinomial probit regression                   Number of obs     =        360
                                                Wald chi2(44)     =     169.94
Log likelihood = -188.96494                     Prob > chi2       =     0.0000

------------------------------------------------------------------------------
Institute_~e |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
Indigenous   |  (base outcome)
-------------+----------------------------------------------------------------
Formal       |
         GEN |  -.0139691   .4275287    -0.03   0.974    -.8519099    .8239717
         AGE |   .0084386   .0164431     0.51   0.608    -.0237892    .0406665
        POCC |   -1.81205   .4758845    -3.81   0.000    -2.744766   -.8793334
      LIVEHD |   1.048174   .4389568     2.39   0.017     .1878339    1.908513
       HSIZE |   .5968773   .3776346     1.58   0.114    -.1432729    1.337028
          DR |   -1.30147   .8481874    -1.53   0.125    -2.963886     .360947
         EDU |   .1372127   .0902532     1.52   0.128    -.0396804    .3141057
       NCHLD |  -2.009963   .5878035    -3.42   0.001    -3.162037   -.8578892
      Number |  -.0702382   .0214957    -3.27   0.001     -.112369   -.0281073
        REPP |  -.2529217   .1032513    -2.45   0.014    -.4552905   -.0505529
    Interest |   .3246664   .0440689     7.37   0.000      .238293    .4110399
      MFINFO |  -.0327002   1.231957    -0.03   0.979    -2.447291    2.381891
         EXP |   .7894926   .2215283     3.56   0.000     .3553051     1.22368
        LAMT |   .0005099     .00014     3.64   0.000     .0002355    .0007844
     COLTRAL |  -.6781323   .5220887    -1.30   0.194    -1.701407    .3451427
        DIST |   .6032437   .1638023     3.68   0.000     .2821971    .9242904
        ASET |  -.0000473   .0000262    -1.80   0.071    -.0000987    4.13e-06
    Employed |   -1.82988   .7924709    -2.31   0.021    -3.383094   -.2766654
 No_children |   2.059572   .5660452     3.64   0.000     .9501438       3.169
 Income_Head |   -.000257   .0000922    -2.79   0.005    -.0004376   -.0000763
 Income_mem1 |  -.0002074     .00009    -2.30   0.021    -.0003839    -.000031
       HHINC |   .0002281   .0000755     3.02   0.003     .0000801    .0003761
       _cons |  -3.687262   2.291527    -1.61   0.108    -8.178571     .804048
-------------+----------------------------------------------------------------
Semi_formal  |
         GEN |   .9043141   .3537572     2.56   0.011     .2109627    1.597665
         AGE |   .0105513   .0142827     0.74   0.460    -.0174423    .0385449
        POCC |  -.3661406   .3562858    -1.03   0.304    -1.064448    .3321667
      LIVEHD |   .9856007   .3729059     2.64   0.008     .2547186    1.716483
       HSIZE |  -.4569147    .321342    -1.42   0.155    -1.086733     .172904
          DR |   .8668524   .7257163     1.19   0.232    -.5555254     2.28923
         EDU |   .1005468   .0802491     1.25   0.210    -.0567385    .2578321
       NCHLD |  -.7025467   .5299954    -1.33   0.185    -1.741319    .3362252
      Number |   .0491719   .0175198     2.81   0.005     .0148338       .08351
        REPP |  -.0182181   .0620057    -0.29   0.769    -.1397471    .1033109
    Interest |    .147608   .0371052     3.98   0.000     .0748832    .2203328
      MFINFO |  -1.083216   .7130293    -1.52   0.129    -2.480728    .3142958
         EXP |   .5670726   .2125462     2.67   0.008     .1504897    .9836555
        LAMT |   .0001948   .0001063     1.83   0.067    -.0000136    .0004032
     COLTRAL |  -.6291886   .4466682    -1.41   0.159    -1.504642    .2462649
        DIST |   .6813869   .1580389     4.31   0.000     .3716363    .9911374
        ASET |   -.000082     .00003    -2.73   0.006    -.0001408   -.0000232
    Employed |   1.082795   .5651247     1.92   0.055     -.024829    2.190419
 No_children |   .6814592   .5018913     1.36   0.175    -.3022297    1.665148
 Income_Head |   -.000139    .000071    -1.96   0.050     -.000278    1.05e-07
 Income_mem1 |   .0000317   .0000721     0.44   0.660    -.0001096    .0001729
       HHINC |   .0000667   .0000576     1.16   0.247    -.0000462    .0001797
       _cons |  -6.629852   1.766197    -3.75   0.000    -10.09153   -3.16817
------------------------------------------------------------------------------
```

Appendix 6: Results of Marginal Effects after Multinomial Probit

```
mfx, predict(outcome (1))
Marginal effects after mprobit
      y = Pr(Institute_Type==Formal) (predict, outcome (1))
        = .27331628
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.      z    P>|z|  [    95% C.I.   ]       X
---------+--------------------------------------------------------------------
     GEN*|  -.1634417      .08359   -1.96   0.051  -.327281  .000397   .383333
     AGE |   .0002083      .00359    0.06   0.954  -.006826  .007242   44.0278
    POCC*|  -.3726811      .08889   -4.19   0.000  -.546894 -.198468   .483333
  LIVEHD*|   .0913321      .08462    1.08   0.280  -.074518  .257182   .666667
   HSIZE |   .2351123      .07611    3.09   0.002   .085939  .384286   5.46944
      DR |  -.4889469      .16937   -2.89   0.004  -.820907 -.156987   1.24819
     EDU |   .0163939      .01827    0.90   0.369  -.019408  .052196   2.36389
   NCHLD |  -.3812372      .09534   -4.00   0.000  -.568106 -.194368   2.98889
  Number |  -.0268253      .00491   -5.46   0.000  -.036446 -.017204   13.9222
    REPP |  -.0608279      .02261   -2.69   0.007  -.105149 -.016507   5.00556
Interest |   .0553301      .00941    5.88   0.000    .03689   .07377   8.60231
  MFINFO*|   .1674302      .16536    1.01   0.311  -.156673  .491534   .952778
     EXP |   .0964248      .02581    3.74   0.000   .045831  .147019     4.975
    LAMT |   .0000937      .00003    3.29   0.001   .000038  .000149    1160.4
 COLTRAL*|  -.0509445      .12055   -0.42   0.673  -.287212  .185323   .813889
    DIST |   .0282369      .01712    1.65   0.099  -.005313  .061787   2.18611
    ASET |   3.03e-06      .00001    0.41   0.683  -.000012  .000018   5627.78
Employed |  -.6625532      .17198   -3.85   0.000  -.999631 -.325475   2.56111
No_chi~n |   .3976851      .08958    4.44   0.000   .222109  .573261   3.22778
Income~d |  -.0000397      .00002   -2.12   0.034  -.000076 -3.0e-06   5266.53
Income~1 |  -.0000584      .00002   -3.28   0.001  -.000093 -.000023   4808.66
   HHINC |   .0000456      .00002    3.03   0.002   .000016  .000075   12154.3
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1

. mfx, predict(outcome (2))


Marginal effects after mprobit
      y  = Pr(Institute_Type==Semi-formal) (predict, outcome (2))
         =  .56558519
------------------------------------------------------------------------------
variable |      dy/dx    Std. Err.      z    P>|z|  [    95% C.I.   ]       X
---------+--------------------------------------------------------------------
     GEN*|   .2657632      .08353    3.18   0.001   .102046   .42948   .383333
     AGE |   .0016414      .00377    0.44   0.663  -.005742  .009025   44.0278
    POCC*|   .2092923      .09659    2.17   0.030   .019978  .398606   .483333
  LIVEHD*|   .1220692      .09127    1.34   0.181  -.056813  .300951   .666667
   HSIZE |  -.2473362      .07706   -3.21   0.001  -.398381 -.096292   5.46944
      DR |   .5002119      .17277    2.90   0.004   .161592  .838832   1.24819
     EDU |   .0052387      .01959    0.27   0.789  -.033161  .043638   2.36389
   NCHLD |   .1559368      .10412    1.50   0.134  -.048125  .359998   2.98889
  Number |   .0277173      .00481    5.76   0.000   .018285   .03715   13.9222
    REPP |   .0408221      .02013    2.03   0.043    .00137  .080274   5.00556
Interest |  -.0148802      .01137   -1.31   0.190  -.037157  .007396   8.60231
  MFINFO*|  -.2754891      .16004   -1.72   0.085  -.589156  .038177   .952778
     EXP |   .0266833      .02985    0.89   0.371  -.031815  .085182     4.975
    LAMT |  -.0000346      .00003   -1.20   0.232  -.000091  .000022    1160.4
 COLTRAL*|  -.0532164      .12115   -0.44   0.660  -.290673   .18424   .813889
    DIST |   .0953255      .02208    4.32   0.000   .052057  .138594   2.18611
    ASET |  -.0000161      .00001   -1.74   0.083  -.000034  2.1e-06   5627.78
Employed |   .6622214      .15537    4.26   0.000   .357701  .966742   2.56111
No_chi~n |  -.1713927      .09585   -1.79   0.074  -.359252  .016467   3.22778
Income~d |   5.09e-06      .00002    0.28   0.780  -.000031  .000041   5266.53
Income~1 |   .0000476      .00002    2.73   0.006   .000013  .000082   4808.66
   HHINC |  -.0000216      .00001   -1.49   0.135   -.00005  6.8e-06   12154.3
------------------------------------------------------------------------------
(*) dy/dx is for discrete change of dummy variable from 0 to 1
```

Appendix 7: Nearest Neighbour Matching of Results Impact of Participation in Formal Microfinance System on Income of Beneficiary

```
 psmatch2 FORIND, outcome( Income_mem1 ) pscore(PS) neighbor(1) common logit
------------------------------------------------------------------------------
Variable    Sample    |    Treated     Controls   Difference      S.E.    T-stat
-------------------------------------------------------------------------------
Income_mem1  Unmatched| 5479.275       3955.6     1523.675     590.726181   2.58
                 ATT | 6176.56044   2653.73626   3522.82418   999.754352   3.52
                 ATU | 4033.68468   7229.95495   3196.27027            .      .
                 ATE |                           3343.38119            .      .
-------------------------------------------------------------------------------
```


Appendix 8: Kernel Matching Results of Impact of Participation in Formal Microfinance System on Income of Beneficiary

```
psmatch2 FORIND, outcome( Income_mem1 ) pscore(PS) kernel kerneltype(epan) common
odds logit ate

------------------------------------------------------------------------------
Variable      Sample |    Treated     Controls   Difference      S.E.      T-stat
---------------------+--------------------------------------------------------
Income_mem1  Unmatched|  5479.275    3955.6       1523.675     590.726181    2.58
                 ATT | 6161.85556   2714.95241   3446.90314    1348.0923    2.56
                 ATU | 4033.68468   7858.12042   3824.43574            .       .
                 ATE |                          3655.39129            .       .
------------------------------------------------------------------------------
```

Appendix 9: Nearest Neighbour Matching results of impact of participation in Formal microfinance system on income of beneficiary

```
 psmatch2 FORIND, outcome( Income_mem1 ) pscore(PS) neighbor(1) common logit
------------------------------------------------------------------------------
Variable    Sample    |    Treated     Controls   Difference      S.E.    T-stat
---------------------+--------------------------------------------------------
Income_mem1 Unmatched| 5479.275       3955.6     1523.675     590.726181   2.58
                ATT | 6176.56044   2653.73626   3522.82418   999.754352   3.52
                ATU | 4033.68468   7229.95495   3196.27027            .      .
                ATE |                           3343.38119            .      .
---------------------+--------------------------------------------------------
```

Appendix 10: Kernel Matching Results of Impact of Participation in Formal Microfinance System on Income of Beneficiary

```
psmatch2 FORIND, outcome( Income_mem1 ) pscore(PS) kernel kerneltype(epan)
common odds logit ate

------------------------------------------------------------------------------
Variable      Sample |    Treated     Controls   Difference    S.E.  T-stat
---------------------+--------------------------------------------------------
Income_mem1 Unmatched|  5479.275    3955.6       1523.675    590.726181   2.58
                ATT | 6161.85556   2714.95241  3446.90314   1348.0923    2.56
                ATU | 4033.68468   7858.12042   3824.43574          .        .
                ATE |                           3655.39129          .        .
----------------------------+-------------------------------------------------
```

Appendix 11: Teffects (ATT) of Impact of Participation in Formal Microfinance System on Income of Beneficiary

```
teffects nnmatch ( Income_mem1 BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FORIND), atet

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         2
------------------------------------------------------------------------------
                         |               AI Robust
            Income_mem1 | Coef.    Std. Err. z    P>|z|  [95% Conf. Interval]
-------------------------+----------------------------------------------------
ATET                     |
                 FORIND |
(Formal vs Indigenous)   | 1545.617 838.6429 1.84  0.065  -98.09329    3189.327
```

Appendix 12: Teffects (ATE) of Impact of Participation in Formal Microfinance System on Income of Beneficiary

```
teffects nnmatch ( Income_mem1 BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FORIND), ate

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         2
------------------------------------------------------------------------------
                       |              AI Robust
Income_mem1            |    Coef.     Std. Err.      z    P>|z|   [95% Conf.
Interval]
---------------------+--------------------------------------------------------
ATE                    |
               FORIND|
Formal vs Indigenous)|  2641.108   905.7799     2.92   0.004  865.8123
4416.404
------------------------------------------------------------------------------
```

Appendix 13: Nearest Neighbour Matching Results of Impact of Participation in Formal Microfinance System on Household Income.

```
psmatch2 FORIND, outcome(HHINC) pscore(PS) neighbor(1) common logit ate

------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference         S.E.  T-stat
-------------------------------------------------------------------------------
   HHINC  Unmatched | 13936.2583    21700.375  -7764.11667  10102.9165    -0.77
              ATT | 14524.6044   23428.5714  -8903.96703  87216.2675    -0.10
              ATU | 22655.1261   16228.8829  -6426.24324           .       .
              ATE |                          -7542.44554           .       .
------------------------------------------------------------------------------
```

Appendix 14: Kernel Matching Results of Impact of Participation in Formal Microfinance System on Household Income.

```
psmatch2 FORIND, outcome(HHINC) pscore(PS) kernel kerneltype(epan) common odds
logit ate

------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference         S.E.   T-stat
-------------------------------------------------------------------------------
   HHINC  Unmatched | 13936.2583    21700.375  -7764.11667   10102.9165    -0.77
              ATT | 14491.5444   13146.5309   1345.01358   44751.2525     0.03
              ATU | 22655.1261   18359.4661  -4295.66006           .        .
              ATE |                          -1769.9853           .        .
------------------------------------------------------------------------------
```

Appendix 15: Teffects (ATT) Of Impact of Participation in Formal Microfinance System on Household Income.

```
teffects nnmatch (HHINC BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD
BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FORIND), atet

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         2
------------------------------------------------------------------------------
                     |              AI Robust
               HHINC |    Coef.    Std. Err.        z      P>|z|   [95% Conf.
Interval]
---------------------+--------------------------------------------------------
ATET                 |
                FORIND|
(Formal vs Indigenous) | -7222.775   13045.33    -0.55   0.580  -32791.15  18345.6
------------------------------------------------------------------------------
```

Appendix 16: Teffects (ATE) Of Impact of Participation in Formal Microfinance System on Household Income.

```
teffects nnmatch (HHINC BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FORIND), ate

Treatment-effects estimation                   Number of obs      =       240
Estimator      : nearest-neighbor matching     Matches: requested =         1
Outcome model  : matching                                  min =         1
Distance metric: Mahalanobis                               max =         2
------------------------------------------------------------------------------
                     |              AI Robust
              HHINC |      Coef.   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-------------------- +----------------------------------------------------------
ATE                  |
             FORIND |
(Formal vs Indigenous |  -5277.65  11012.02    -0.48   0.632    -26860.81  16305.51
------------------------------------------------------------------------------
```

Appendix 17: Nearest Neighbour Matching Results of Impact of Participation in Formal Microfinance System on Household Asset Value.

```
psmatch2 FORIND, outcome(ASET) pscore(PS) neighbor(1) common logit ate

------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference         S.E.  T-stat
------------------------------------------------------------------------------
    ASET  Unmatched | 5573.06667   7340.95833  -1767.89167  1431.77424    -1.23
              ATT | 6394.45055   3934.48352   2459.96703  2017.29993     1.22
              ATU | 7348.71171   4835.72072  -2512.99099            .       .
              ATE |                           -272.69802            .       .
------------------------------------------------------------------------------
```

Appendix:18: Kernel Matching Results of Impact of Participation in Formal Microfinance System on Household Asset Value.

```
psmatch2 FORIND, outcome(ASET) pscore(PS) kernel kerneltype(epan) common odds
logit ate
------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference         S.E.  T-stat
------------------------------------------------------------------------------
    ASET  Unmatched | 5573.06667   7340.95833  -1767.89167  1431.77424    -1.23
              ATT | 6377.27778   4102.74527   2274.53251  4574.12005     0.50
              ATU | 7348.71171   5312.02586  -2036.68585            .       .
              ATE |                           -106.289572            .       .
```

Appendix 19: Teffects (ATT) of Impact of Participation in Formal Microfinance System on Household Asset Value.

```
. teffects nnmatch (ASET BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FORIND), atet

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         2
------------------------------------------------------------------------------
                     |              AI Robust
                ASET |   Coef.    Std. Err.    z     P>|z|  [95% Conf.
Interval]
---------------------+--------------------------------------------------------
ATET                 |
              FORIND |
(Formal vs Indigenous) |-774.6333  1919.206  -0.40  0.686  -4536.209  2986.942
```

Appendix 20: Teffects (ATE) of Impact of Participation in Formal Microfinance System on Household Asset Value.

```
teffects nnmatch (ASET BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD
BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FORIND), ate

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         2
------------------------------------------------------------------------------
                     |              AI Robust
                ASET | Coef.      Std. Err.    z     P>|z|  [95% Conf.
Interval]
---------------------+--------------------------------------------------------
ATE                  |
              FORIND|
(Formal vs Indigenous) |-2083.033  1339.186  -1.56    0.120  -4707.79  541.7236
```

Appendix 21: Nearest Neighbour Matching Results of Impact of Participation in Semi-Formal Microfinance System on Income of Beneficiary

```
psmatch2 SEMIND, outcome( Income_mem1 ) pscore(PS) neighbor(1) common logit ate
------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference       S.E      T-stat
---------------------------+--------------------------------------------------
---Income_mem1 Unmatched|  4928.25      3955.6     972.65      676.536625     1.44
                ATT |   5040.65517   3315.09483   1725.56034   1236.57202    1.40
                ATU |   3955.6       4452.33333   496.733333        .       .
                ATE |                             1100.73305
---------------------------+--------------------------------------------------
```

Appendix 22: Kernel Matching Results of Impact of Participation in Semi-Formal Microfinance System on Income Of Beneficiary

```
psmatch2 SEMIND, outcome( Income_mem1 ) pscore(PS) kernel kerneltype(epan)
common odds logit ate

------------------------------------------------------------------------------
Variable   Sample |    Treated     Controls    Difference         S.E.   T-stat
-------------------------+----------------------------------------------------
Income_mem1  Unmatched | 4928.25     3955.6      972.65     676.536625     1.44
                   ATT | 4783.26415  4069.69128  713.572871   978.275986   0.73
                   ATU | 3958.58824   4276.25425  317.666013                .
                   ATE |                           504.182133                .
-------------------------+----------------------------------------------------
```

Appendix 23: Teffects (ATT) of Impact of Participation in Semi-Formal Microfinance System on Income of Beneficiary

```
teffects nnmatch ( Income_mem1 BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (SEMIND), atet

Treatment-effects estimation                   Number of obs      =       240
Estimator      : nearest-neighbor matching     Matches: requested =         1
Outcome model  : matching                                  min =         1
Distance metric: Mahalanobis                               max =         4
------------------------------------------------------------------------------
                             |               AI Robust
                 Income_mem1 |  Coef.   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-----------------------------+------------------------------------------------
ATET                         |
                      SEMIND |
(Semiformal vs Indigenous)   |  852.9167   741.0316     1.15   0.250    -599.4786
2305.312
------------------------------------------------------------------------------
```

Appendix 24: Teffect (ATE) of Impact of Participation in Semi-Formal Microfinance System on Income of Beneficiary

```
teffects nnmatch ( Income_mem1 BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (SEMIND), ate

Treatment-effects estimation                   Number of obs      =       240
Estimator      : nearest-neighbor matching     Matches: requested =         1
Outcome model  : matching                                  min =         1
Distance metric: Mahalanobis                               max =         4
------------------------------------------------------------------------------
                             |              AI Robust
                Income_mem1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
----------------------------+-------------------------------------------------
ATE                         |
                    SEMIND  |
(Semiformal vs Indigenous)  |  592.5333   495.4359     1.20   0.232    -378.5033    1563.57
```

Appendix 25: Nearest Neighbour Matching Results of Impact Of Participation in Semi-Formal Microfinance System on Household Income.

```
. psmatch2 SEMIND, outcome(HHINC) pscore(PS) neighbor(1) common logit ate

------------------------------------------------------------------------------
Variable   Sample |    Treated     Controls   Difference         S.E. T-stat
---------------------------+--------------------------------------------------
  HHINC  Unmatched|  12342.925    21700.375     -9357.45   10093.6166    -0.93
             ATT | 12508.2931   10474.3017   2033.99138   3233.68582     0.63
             ATU |  21700.375    10064.125    -11636.25            .        .
             ATE |                          -4916.97881            .        .
---------------------------+--------------------------------------------------
```

Appendix 26: Kernel Matching results of impact of participation in semi-formal microfinance system on Household income.

```
psmatch2 SEMIND, outcome(HHINC) pscore(PS) kernel kerneltype(epan) common odds
logit ate

------------------------------------------------------------------------------
Variable  Sample |    Treated     Controls   Difference         S.E.     T-stat
-------------------------+----------------------------------------------------
-- HHINC  Unmatched |  12342.925    21700.375  -9357.45     10093.6166    -0.93
             ATT | 12287.5189   18352.6892  -6065.17032     28534.6714    -0.21
             ATU | 21729.7899   9767.07964  -11962.7103            .        .
             ATE |                          -9184.31367            .        .
-------------------------+----------------------------------------------------
```

Appendix 27: Teffect (ATT) of Impact of P

articipation in Semi-Formal Microfinance System on Household Income.

```
teffects nnmatch (HHINC BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (SEMIND), atet

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         4
------------------------------------------------------------------------------
                             |               AI Robust
                      HHINC | Coef.   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-----------------------------+------------------------------------------------
ATET                         |
                    SEMIND   |
(Semiformal vs Indigenous)|2284.592  14234.33  0.16 0.872 -25614.19    30183.37
------------------------------------------------------------------------------
```

Appendix 28: Teffect (ATE) Of Impact of Participation in Semi-Formal Microfinance System on Household Income.

```
. teffects nnmatch (HHINC BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (SEMIND), ate

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         4
------------------------------------------------------------------------------
                             |               AI Robust
                      HHINC  |      Coef.   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-----------------------------+------------------------------------------------
ATE                          |
                    SEMIND   |
(Semiformal vs Indigenous) | -4515.392 11236.77  -0.40 0.688 -26539.06    17508.28
```

Appendix 29: Nearest Neighbour Matching Results of Impact of Participation in Semi-Formal Microfinance on Household Asset Value.

```
 psmatch2 SEMIND, outcome(ASET) pscore(PS) neighbor(1) common logit ate

------------------------------------------------------------------------------
- Variable   Sample |    Treated     Controls   Difference         S.E.  T-stat
-----------------------------+------------------------------------------------
  ASET  Unmatched | 3969.30833   7340.95833     -3371.65   1025.91489    -3.29
              ATT | 3931.85345   6316.36207  -2384.50862   4366.34603    -0.55
              ATU | 7340.95833   3301.29167  -4039.66667            .        .
              ATE |                          -3226.11441            .        .
-----------------------------+------------------------------------------------
```

Appendix 30: Kernel Matching Results Impact of Participation in Semi-Formal Microfinance System on Household Asset Value.

```
psmatch2 SEMIND, outcome(ASET) pscore(PS) kernel kerneltype(epan) common odds
logit ate
------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference         S.E.  T-stat
---------------------------+--------------------------------------------------
    ASET  Unmatched | 3969.30833   7340.95833     -3371.65  1025.91489    -3.29
                ATT | 4082.79245   6396.31417  -2313.52171  2813.44288    -0.82
                ATU | 7362.01681   3253.31285  -4108.70395           .       .
                ATE |                          -3262.97365           .       .
---------------------------+--------------------------------------------------
```


Appendix 31: Teffect (ATT) of Impact of Participation in Semi-Formal Microfinance System on Household Asset Value.

```
teffects nnmatch (ASET BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD
BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (SEMIND), atet

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                  min =         1
Distance metric: Mahalanobis                               max =         4
------------------------------------------------------------------------------
                             |              AI Robust
                        ASET |  Coef.   Std. Err.      z    P>|  [95% Conf.
Interval]
-----------------------------+------------------------------------------------
ATET                         |
                     SEMIND |
(Semiformal vs Indigenous) | -4919.317 2309.22  -2.13  0.033 -9445.305-393.3286
------------------------------------------------------------------------------
```

Appendix 32: Teffect (ATE) of Impact of Participation in Semi-Formal Microfinance System on Household Asset Value.

```
teffects nnmatch (ASET BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD
BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (SEMIND), ate

Treatment-effects estimation                    Number of obs      =       240
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                  min =         1
Distance metric: Mahalanobis                               max =         4
------------------------------------------------------------------------------
                             |              AI Robust
                        ASET |  Coef.   Std. Err.   z    P>|z|  [95% Conf.
Interval]
-----------------------------+------------------------------------------------
ATE                          |
                     SEMIND |
(Semiformal vs Indigenous)  |-3943.35 1593.829 -2.47 0.013 -7067.198  -819.5022
------------------------------------------------------------------------------
```

Appendix 33: Nearest Neighbour Matching Results of Impact of Participation in Formal and Semiformal Microfinance Systems on Income of Beneficiary.

```
psmatch2 FOR_SEMIND, outcome( Income_mem1 ) pscore(PS) neighbor(1) common logit
ate------------------------------------------------------------------------------

Variable       Sample |    Treated     Controls   Difference      S.E.   T-stat
---------------------------+--------------------------------------------------
Income_mem1 Unmatched |  5203.7625    3955.6    1248.1625   606.583002     2.06
                  ATT |  4920.6555  3764.15311  1156.50239  749.026753     1.54
                  ATU |     3955.6      4428.75       473.15            .     .
                  ATE |                            907.255319            .     .
---------------------------+--------------------------------------------------
```

Appendix 34: Kernel Matching Results of Impact of Participation in Formal and Semiformal Microfinance Systems on Income of Beneficiary.

```
psmatch2 FOR_SEMIND, outcome( Income_mem1 ) pscore(PS) kernel kerneltype(epan)
common odds logit ate

------------------------------------------------------------------------------

Variable     Sample |    Treated     Controls   Difference      S.E.     T-stat

---------------------------+--------------------------------------------------

Income_mem1  Unmatched|  5203.7625    3955.6   1248.1625    606.583002     2.06

                 ATT |  4920.6555   3790.3451    1130.3104   638.077311    1.77

                 ATU |   3955.6       4466.57531   510.975312        .        .
ATE |                                 904.413104                    .

---------------------+--------------------------------------------------
```

Appendix 35: Teffects (ATT) Under Nearest Neighbour Matching of Impact of Participation in Formal and Semiformal Microfinance Systems on Income of Beneficiary.

```
teffects nnmatch ( Income_mem1 BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FOR_SEMIND), atet

Treatment-effects estimation                    Number of obs      =       360
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         4
------------------------------------------------------------------------------
                                     |               AI Robust
                         Income_mem1 |      Coef.   Std. Err.      z    P>|z|
[95% Conf. Interval]
-------------------------------------+----------------------------------------
ATET                                 |
                          FOR_SEMIND |
(Formal and semiformal vs Indigenous)  |1352.171 582.7629 2.32 0.020 209.9765
2494.365
```

Appendix 36: Teffects (ATE) Under Nearest Neighbour Matching of Impact of Participation in Formal and Semiformal Microfinance Systems on Income of Beneficiary.

```
teffects nnmatch ( Income_mem1 BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FOR_SEMIND), ate

Treatment-effects estimation                   Number of obs      =       360
Estimator      : nearest-neighbor matching     Matches: requested =         1
Outcome model  : matching                                  min =         1
Distance metric: Mahalanobis                               max =         4
------------------------------------------------------------------------------
             |              AI Robust
Income_mem1  |      Coef.   Std. Err.      z    P>|z|     [95% Conf.
Interval]
-------------------------------------+----------------------------------------
ATE          |
 FOR_SEMIND  |
(Forsem vs Ind) |   1149.122   486.3443     2.36   0.018     195.9049   2102.34
------------------------------------------------------------------------------
```

Appendix 37: Nearest Neighbour Matching Results of Impact of Participation in Formal and Semi-formal Microfinance Systems on Income of household.

```
 psmatch2 FOR_SEMIND, outcome(HHINC) pscore(PS) neighbor(1) common logit ate

------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference      S.E.   T-stat
---------------------------+--------------------------------------------------
   HHINC  Unmatched | 13139.5917   21700.375  -8560.78333   7196.14328    -1.19
              ATT | 12548.6603   17702.9809  -5154.32057  29756.7605    -0.17
              ATU |  21700.375   11117.4833  -10582.8917            .     .
              ATE |                           -7134.3465            .     .
```

Appendix 38: Kernel Matching Results of Impact of Participation in Formal and Semi-formal Microfinance Systems on Income of household.

```
psmatch2 FOR_SEMIND, outcome( HHINC ) pscore(PS) kernel kerneltype(epan) common
odds logit ate
------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference         S.E.  T-stat
---------------------------+--------------------------------------------------
   HHINC  Unmatched | 13139.5917   21700.375  -8560.78333   7196.14328    -1.19
              ATT | 12548.6603   17870.8672  -5322.20692  19317.531    -0.28
              ATU |  21700.375   11921.4647  -9778.91035            .       .
              ATE |                           -6947.75224            .       .
------------------------------------------------------------------------------
```

Appendix 39: Teffects (ATT) Under Nearest Neighbour Matching of Impact of Participation in Formal and Semiformal Microfinance Systems on Income of Household

```
. teffects nnmatch (HHINC BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FOR_SEMIND), atet

Treatment-effects estimation                    Number of obs      =       360
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         4
------------------------------------------------------------------------------
                     |              AI Robust
      HHINC |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------------------------------+----------------------------------------
ATET                 |
 FOR_SEMIND |
(ForSem Ind  |  -1748.763   6607.145    -0.26   0.791    -14698.53  11201
```

Appendix 40 : Teffects (ATE) Under Nearest Neighbour Matching of Impact of Participation in Formal and Semi-formal Microfinance Systems on Income of Household

```
teffects nnmatch (HHINC BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT
BLIVEHD BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FOR_SEMIND), ate

Treatment-effects estimation                    Number of obs      =       360
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         4
------------------------------------------------------------------------------
                                     |              AI Robust
        HHINC        |Coef.      Std. Err.      z     P>|z|    [95% Conf.
Interval]
-------------------------------------+----------------------------------------
ATE                  |
          FOR_SEMIND |
(Forsem vs ind)      | -4678.631   7300.077   -0.64   0.522  -18986.52 9629.257
```

Appendix 41: Nearest Neighbour Matching Results of Impact of Participation in Formal and Semi-formal Microfinance Systems on Household Asset Value.

```
psmatch2 FOR_SEMIND, outcome(ASET) pscore(PS) neighbor(1) common logit ate
------------------------------------------------------------------------------
 Variable Sample  |    Treated     Controls   Difference     S.E.       T-stat
--------------------------+---------------------------------------------------
ASET     Unmatched |  4771.1875   7340.95833  -2569.77083   1035.40399    -2.48
              ATT | 4928.75598   5747.37799   -818.62201   2337.20007    -0.35
              ATU | 7340.95833   3542.84167  -3798.11667            .        .
              ATE |                          -1905.36778            .        .
```

Appendix 42: Kernel Matching Results of Impact of Participation in Formal and Semi-formal Microfinance Systems on Household Asset Value.

```
 psmatch2 FOR_SEMIND, outcome(ASET) pscore(PS) kernel kerneltype(epan) common
odds logit ate
------------------------------------------------------------------------------
Variable     Sample |    Treated     Controls   Difference        S.E.   T-stat
---------------------------+--------------------------------------------------
    ASET  Unmatched |  4771.1875  7340.95833  -2569.77083   1035.40399    -2.48
              ATT | 4928.75598   5570.16643  -641.410447  1991.03669    -0.32
              ATU | 7340.95833   4248.12994   -3092.8284            .     .
              ATE |                          -1535.54465            .     .
```

Appendix 43: Teffects (ATT) Under Nearest Neighbour Matching of Impact of Participation in Formal and Semi-formal Microfinance Systems on Household Asset Value.

```
teffects nnmatch (ASET BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD
BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FOR_SEMIND), ate


Treatment-effects estimation                   Number of obs      =       360
Estimator      : nearest-neighbor matching     Matches: requested =         1
Outcome model  : matching                                  min =         1
Distance metric: Mahalanobis                               max =         4
------------------------------------------------------------------------------
             |               AI Robust
        ASET |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ATE          |
   FOR_SEMIND |
(ForSem vs Ind) | -3349.153   1820.255    -1.84   0.066    -6916.787    218.481
```

Appendix 44: Teffects (ATE) Under Nearest Neighbour Matching of Impact of Participation in Formal and Semi-formal Microfinance Systems on Household Asset Value.

```
teffects nnmatch (ASET BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD
BMFINFO BDIST BMEM BTYLND BCOLTRAL BTFCL BREPP DR) (FOR_SEMIND), ate

Treatment-effects estimation                    Number of obs      =       360
Estimator      : nearest-neighbor matching      Matches: requested =         1
Outcome model  : matching                                   min =         1
Distance metric: Mahalanobis                                max =         4
------------------------------------------------------------------------------
             |              AI Robust
        ASET |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
ATE          |
    FOR_SEMIND
(ForSem vs Ind) |  -3349.153   1820.255    -1.84   0.066    -6916.787    218.481
```


Appendix 45: Results of Covariate balancing test and sensitivity analysis for formal versus indigenous systems

```
pstest BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD BMFINFO BDIST
BMEM BTYLND BCOLTRAL BTFCL BREPP DR, both
```

Variable	Unmatched / Matched	Mean Treated	Mean Control	%bias	%reduct |bias|	t-test t	t-test p>|t|	V(T)/V(C)
BGEN	U	.30833	.425	-24.3		-1.88	0.061	
	M	.36264	.47253	-22.9	5.8	-1.50	0.134	
BAGE	U	44.958	43.708	10.0		0.77	0.440	0.86
	M	44.264	50.615	-50.7	-408.1	-2.91	0.004	0.53*
SexHH	U	.55	.675	-25.8		-2.00	0.047	
	M	.57143	.50549	13.6	47.3	0.89	0.375	
AgeHH	U	48.442	46.675	15.1		1.17	0.243	1.14
	M	47.538	54.67	-61.0	-303.7	-3.92	0.000	0.91
HSI	U	5.3833	5.8083	-19.9		-1.54	0.124	3.73*
	M	5.4396	6.7253	-60.3	-202.5	-3.87	0.000	4.12*
BEDU	U	4.8917	2.1917	55.2		4.28	0.000	1.33
	M	4.6703	6.3407	-34.2	38.1	-1.81	0.072	0.57*
BEXP	U	5.675	4.0333	66.9		5.18	0.000	38.99*
	M	4.3846	4	15.7	76.6	1.75	0.081	20.86*
POCC	U	.23333	.66667	-96.4		-7.46	0.000	.
	M	.2967	.14286	34.2	64.5	2.54	0.012	.
BLAMT	U	1260.4	1117.7	9.0		0.69	0.489	0.48*
	M	1247.8	534.84	44.7	-399.5	3.97	0.000	0.86
BLIVEHD	U	.73333	.60833	26.7		2.07	0.040	.
	M	.68132	.83516	-32.9	-23.1	-2.45	0.015	.
BMFINFO	U	.975	.94167	16.7		1.29	0.198	.
	M	.96703	.94505	11.0	34.1	0.72	0.472	.
BDIST	U	2.7687	3.1375	-7.9		-0.61	0.543	0.36*
	M	3.0852	3.0187	1.4	82.0	0.09	0.931	0.34*
BMEM	U	.725	.625	21.4		1.66	0.099	.
	M	.69231	.71429	-4.7	78.0	-0.32	0.747	.
BTYLND	U	.99167	.98333	7.5		0.58	0.563	.
	M	.98901	1	-9.9	-31.9	-1.00	0.319	.
BCOLTRAL	U	.89167	.75833	35.5		2.75	0.006	.
	M	.85714	.91209	-14.6	58.8	-1.16	0.248	.
BTFCL	U	.11667	.475	-85.0		-6.58	0.000	.
	M	.14286	.15385	-2.6	96.9	-0.21	0.836	.
BREPP	U	.36875	.46736	-54.5		-4.22	0.000	0.32*
	M	.37637	.30769	37.9	30.4	2.28	0.024	0.32*
DR	U	1.3364	1.3183	2.1		0.16	0.872	1.79*
	M	1.287	1.5668	-32.4	-1450.0	-2.35	0.020	2.78*

* if variance ratio outside [0.70; 1.43] for U and [0.66; 1.52] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.459	152.59	0.000	32.2	22.8	191.8*	1.62	67
Matched	0.231	57.84	0.000	26.9	27.6	126.6*	1.42	78

* if B>25%, R outside [0.5; 2]

Appendix 46: Results of Covariate balancing test and sensitivity analysis for formal and semi-formal versus indigenous systems

```
. pstest BGEN BAGE SexHH AgeHH HSIZE BEDU BEXP POCC BLAMT BLIVEHD BMFINFO BDIST
BMEM BTYLND BCOLTRAL BTFCL BREPP DR, both
```

Variable	Unmatched / Matched	Mean: Treated	Mean: Control	%bias	%reduct |bias|	t-test: t	t-test: p>|t|	V(T)/V(C)
BGEN	U	.3625	.425	-12.8		-1.15	0.251	.
	M	.35885	.34928	2.0	84.7	0.20	0.838	.
BAGE	U	44.763	43.708	8.4		0.77	0.444	0.85
	M	44.732	44.019	5.7	32.4	0.53	0.598	0.65*
SexHH	U	.6375	.675	-7.9		-0.70	0.483	.
	M	.65072	.76077	-23.1	-193.5	-2.48	0.014	.
AgeHH	U	47.408	46.675	6.5		0.58	0.562	1.00
	M	47.421	49.512	-18.5	-185.1	-1.87	0.062	0.95
HSIZE	U	5.3	5.8083	-26.6		-2.21	0.028	2.81*
	M	5.3923	6.0048	-32.0	-20.5	-3.26	0.001	3.11*
BEDU	U	3.8792	2.1917	35.1		3.09	0.002	1.25
	M	3.488	4.4163	-19.3	45.0	-1.71	0.088	0.63*
BEXP	U	4.9167	4.0333	42.7		3.33	0.001	27.41*
	M	4.5789	4	28.0	34.5	3.24	0.001	33.77*
POCC	U	.39167	.66667	-57.1		-5.08	0.000	.
	M	.42105	.35885	12.9	77.4	1.30	0.193	.
BLAMT	U	1181.8	1117.7	3.8		0.35	0.724	0.65*
	M	1163.5	823.11	20.2	-431.0	2.46	0.014	1.02
BLIVEHD	U	.69583	.60833	18.4		1.66	0.097	.
	M	.66507	.7512	-18.1	1.6	-1.94	0.053	.
BMFINFO	U	.95833	.94167	7.6		0.70	0.484	.
	M	.96651	.90431	28.5	-273.2	2.60	0.010	.
BDIST	U	2.976	3.1375	-3.2		-0.30	0.761	0.55*
	M	3.1567	5.1866	-40.7	-1157.2	-3.05	0.002	0.26*
BMEM	U	.7125	.625	18.6		1.68	0.093	.
	M	.69378	.55502	29.5	-58.6	2.95	0.003	.
BTYLND	U	.8625	.98333	-46.4		-3.71	0.000	.
	M	.94737	.86124	33.1	28.7	3.02	0.003	.
BCOLTRAL	U	.84167	.75833	20.9		1.92	0.056	.
	M	.82297	.81818	1.2	94.3	0.13	0.899	.
BTFCL	U	.30417	.475	-35.5		-3.22	0.001	.
	M	.29665	.44019	-29.8	16.0	-3.07	0.002	.
BREPP	U	.39201	.46736	-34.6		-3.12	0.002	0.91
	M	.38995	.4362	-21.2	38.6	-2.15	0.032	0.61*
DR	U	1.2131	1.3183	-12.0		-1.02	0.309	1.89*
	M	1.1969	1.4195	-25.3	-111.5	-2.71	0.007	2.03*

* if variance ratio outside [0.78; 1.29] for U and [0.76; 1.31] for M

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.194	89.13	0.000	22.1	18.5	114.2*	3.02*	56
Matched	0.130	75.47	0.000	21.6	22.2	87.6*	1.36	78

* if B>25%, R outside [0.5; 2]

Appendix 47: Results of Rosenbaum bounds under semi –formal Microfinance vs. indigenous.

```
gen delta= Income_mem1 - _Income_mem1 if _treated==1 & _support==1
(149 missing values generated)

. rbounds delta, gamma(1 (0.1) 4)

Rosenbaum bounds for delta (N = 91 matched pairs)
```

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-
1	7.8e-06	7.8e-06	2512.5	2512.5	1330	4000
1.1	.000042	1.2e-06	2290	2795	1095	4325
1.2	.000171	1.8e-07	2060	3010	930	4645
1.3	.000543	2.6e-08	1848.75	3217.5	745	4945
1.4	.001436	3.7e-09	1675	3490	570	5195
1.5	.003282	5.3e-10	1513	3720	440	5495
1.6	.006658	7.5e-11	1350	3967.5	285	5710
1.7	.012247	1.1e-11	1225	4133	145	5980
1.8	.020765	1.5e-12	1085	4335	49.9999	6195
1.9	.03288	2.1e-13	990	4505	-79.9999	6400
2	.049133	2.9e-14	895	4700	-190	6585
2.1	.069877	4.1e-15	780	4840	-255	6785
2.2	.095244	5.6e-16	700	5000	-367	6950
2.3	.125139	1.1e-16	602	5157.5	-438	7090
2.4	.159252	0	515	5317.5	-515	7225
2.5	.197098	0	450	5470	-590	7375
2.6	.238055	0	360	5585	-655	7500
2.7	.281418	0	307.5	5702.5	-715	7650
2.8	.32644	0	210	5825	-775	7812.5
2.9	.372379	0	148	5980	-840	7950
3	.418528	0	85.0001	6072.5	-900	8025
3.1	.464243	0	49.9999	6195	-960	8145
3.2	.508959	0	-19.9999	6300	-1025	8315
3.3	.552198	0	-75.0001	6400	-1100	8427.5
3.4	.593578	0	-130	6475	-1140	8583
3.5	.632804	0	-185	6575	-1205	8700
3.6	.66967	0	-220	6687.5	-1250	8850
3.7	.704043	0	-250	6775	-1300	9000
3.8	.735861	0	-290	6860	-1368	9127.5
3.9	.765116	0	-345	6935	-1437.5	9225
4	.791851	0	-382	6987.5	-1475	9300

```
* gamma  - log odds of differential assignment due to unobserved factors
  sig+   - upper bound significance level
  sig-   - lower bound significance level
  t-hat+ - upper bound Hodges-Lehmann point estimate
  t-hat- - lower bound Hodges-Lehmann point estimate
  CI+    - upper bound confidence interval (a=  .95)
  CI-    - lower bound confidence interval (a=  .95)
```


Appendix 48 : Results of Rosenbaum bounds under formal and semi-formal vs. indigenous microfinance system.

```
gen delta= Income_mem1 - _Income_mem1 if _treated==1 & _support==1
(151 missing values generated)

. rbounds delta, gamma(1 (0.1) 4)

Rosenbaum bounds for delta (N = 209 matched pairs)
```

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-
1	.034129	.034129	525	525	-47.4999	1100
1.1	.109749	.007699	350	700	-215	1275
1.2	.246124	.001465	190	850	-380	1450
1.3	.424606	.000243	44.9999	1020	-505	1600
1.4	.606182	.000036	-75.0001	1130	-645	1755
1.5	.757252	5.0e-06	-200	1265	-750	1900
1.6	.86405	6.3e-07	-315	1375	-872	2050
1.7	.93011	7.5e-08	-425	1505	-960	2182.5
1.8	.966685	8.5e-09	-505	1600	-1050	2325
1.9	.985138	9.3e-10	-600	1705	-1147.5	2450
2	.993744	9.8e-11	-675	1820	-1225	2552.5
2.1	.997497	9.9e-12	-750	1915	-1300	2690
2.2	.999043	9.8e-13	-847.5	2005	-1380	2810
2.3	.999648	9.5e-14	-907.25	2100	-1450	2910
2.4	.999875	9.0e-15	-965	2195	-1520	3025
2.5	.999957	8.9e-16	-1010	2280	-1600	3125
2.6	.999986	1.1e-16	-1087.5	2357.5	-1665	3232.5
2.7	.999995	0	-1150	2450	-1725	3320
2.8	.999999	0	-1197.5	2535	-1770	3415
2.9	1	0	-1250	2600	-1827	3525
3	1	0	-1290	2680	-1890	3615.5
3.1	1	0	-1350	2750	-1950	3725
3.2	1	0	-1400	2830	-2000	3800
3.3	1	0	-1445	2885	-2059.5	3890
3.4	1	0	-1490	2980	-2110	4000
3.5	1	0	-1525	3030	-2170	4077.5
3.6	1	0	-1572.5	3100	-2215	4177.5
3.7	1	0	-1615	3155	-2260	4250
3.8	1	0	-1660	3220	-2300	4350
3.9	1	0	-1700	3275	-2350	4455
4	1	0	-1725	3330	-2397.5	4525

```
* gamma  - log odds of differential assignment due to unobserved factors
  sig+   - upper bound significance level
  sig-   - lower bound significance level
  t-hat+ - upper bound Hodges-Lehmann point estimate
  t-hat- - lower bound Hodges-Lehmann point estimate
  CI+    - upper bound confidence interval (a=  .95)
  CI-    - lower bound confidence interval (a=  .95
```


Appendix 49: Results of test for the presence and correction for endogeneity

```
                                                Number of obs     =       360
                                                F(13, 346)        =      5.78
                                                Prob > F          =    0.0000
                                                R-squared         =    0.1391
                                                Root MSE          =    .6771

------------------------------------------------------------------------------
             |               Robust
      lHHINC |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lDIST |  -.0608693   .0587414    -1.04   0.301    -.1764045    .0546659
      Belong |  -.1047374   .0838312    -1.25   0.212    -.2696202    .0601455
        lAGE |   .3181687   .1480331     2.15   0.032     .0270107    .6093267
         GEN |    .034806   .0859033     0.41   0.686    -.1341524    .2037644
      lHSIZE |   .5085905   .1694059     3.00   0.003     .1753956    .8417855
          DR |   -.202625   .0755235    -2.68   0.008     -.351168   -.0540821
  lYears_edu |   .0727991   .0339519     2.14   0.033      .006021    .1395773
     lNumber |  -.0285764   .0360596    -0.79   0.429    -.0995001    .0423473
      MFINFO |   .1552485   .2009075     0.77   0.440    -.2399051    .5504021
        lEXP |  -.1598681    .139058    -1.15   0.251    -.4333736    .1136373
         lIR |  -.0706273   .0765582    -0.92   0.357    -.2212053    .0799507
       lREPP |   .1713557   .0902105     1.90   0.058    -.0060742    .3487856
      LIVEHD |   .2457103   .0821555     2.99   0.003     .0841233    .4072974
       _cons |   7.402663   .6809937    10.87   0.000     6.063254    8.742071
------------------------------------------------------------------------------
```

Appendix 50: Test for validity of alternative livelihood sources as an instrument

```
.
. predict ehat, res

. reg ehat LIVEHD

      Source |       SS           df       MS      Number of obs   =       360
-------------+----------------------------------   F(1, 358)       =      0.00
       Model |           0         1           0   Prob > F        =    1.0000
    Residual |  158.627237       358   .44309284   R-squared       =    0.0000
-------------+----------------------------------   Adj R-squared   =   -0.0028
       Total |  158.627237       359  .441858598   Root MSE        =    .66565

------------------------------------------------------------------------------
        ehat |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      LIVEHD |  -1.59e-09   .0744222    -0.00   1.000    -.1463596    .1463596
       _cons |   5.28e-10   .0607655     0.00   1.000    -.1195021    .1195021
------------------------------------------------------------------------------
```

Appendix 51: Results of test for endogeneity between Loan Amount and Income

```
 reg lLAMT lDIST Belong lHHINC lAGE GEN lHSIZE DR lYears_edu /*Grp_Loan*/ lNumber
MFINFO lEXP lIR lREPP ehat, vce(robust)

Linear regression                               Number of obs     =        360
                                                F(14, 345)        =      16.03
                                                Prob > F          =     0.0000
                                                R-squared         =     0.3689
                                                Root MSE          =     .93822

------------------------------------------------------------------------------
             |               Robust
       lLAMT |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       lDIST |   .1680718   .0905263     1.86   0.064    -.0099812    .3461247
      Belong |   .1421116   .1224564     1.16   0.247    -.0987434    .3829666
      lHHINC |   .3337712   .4616558     0.72   0.470    -.5742429    1.241785
        lAGE |  -.5053422    .249439    -2.03   0.044    -.9959548   -.0147297
         GEN |   .4448651   .1133584     3.92   0.000     .2219045    .6678256
      lHSIZE |  -.8427817   .3117314    -2.70   0.007    -1.455915   -.2296484
          DR |   .2391762   .1254137     1.91   0.057    -.0074955     .485848
  lYears_edu |    .156247   .0536899     2.91   0.004     .0506463    .2618477
     lNumber |  -.2177929   .0555483    -3.92   0.000    -.3270487    -.108537
      MFINFO |   .9452629    .250456     3.77   0.000       .45265    1.437876
        lEXP |  -.2618235   .1738752    -1.51   0.133    -.6038125    .0801654
         lIR |  -.2044658   .1238028    -1.65   0.100    -.4479691    .0390375
       lREPP |   .9131296   .1504404     6.07   0.000     .6172338    1.209025
        ehat |   .0716378   .4516067     0.16   0.874    -.8166111    .9598866
       _cons |   5.277257   3.726856     1.42   0.158    -2.052963    12.60748
------------------------------------------------------------------------------
```

Appendix 52: Results of Test for Variance Inflation Factor

```
Variable |       VIF       1/VIF
-------------+----------------------
    Grp_Loan |     10.41    0.096043
     lNumber |      9.68    0.103308
      lHSIZE |      2.96    0.337738
          DR |      2.86    0.349242
      Belong |      1.44    0.696452
         lIR |      1.37    0.732453
       lREPP |      1.35    0.739951
       lDIST |      1.34    0.743635
        lEXP |      1.25    0.798654
         GEN |      1.24    0.809109
      MFINFO |      1.21    0.829262
        lAGE |      1.17    0.855237
      lHHINC |      1.16    0.865036
  lYears_edu |      1.10    0.907962
-------------+----------------------
    Mean VIF |      2.75
```

Appendix 53: Institutional Questionnaire

INSTITUTIONAL QUESTIONNAIRE

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF INTEGRATED DEVELOPMENT STUDIES

DEPARTMENT OF AFRICAN AND GENERAL STUDIES

INSTITUTIONAL QUESTIONNAIRE (To be completed by five selected officers of the institution)

"A **Comparative Analysis of indigenous and formal Microfinance Systems in the Upper West Region of Ghana"**

The findings of this study will generate information necessary for the planning of appropriate interventions and help fill the information gap and inform decision makers, planners, researchers and practitioners about the impact of microfinance intervention on the welfare of households, as well as the community. Your honest and genuine participation by responding to the questions is highly appreciated. You are assured that information provided will be treated as strictly confidential and will be used *only* for the purpose of the academic research.

Date ----------

1. Name of institution ----------
   Year of formation----------
   Institutional Information

2. Kindly list and rank (in order of importance) your major services provided to clients in terms of the priority you attach to these services. (e.g. of areas of operation include microcredit, enterprise development, etc.)

Areas of Operation	**Rank**

3. Kindly indicate the socio economic status of your target group. 1= Females only [ ] 2= Males only [ ] 3= Both females and males [ ] 4= poor females only [ ] 5= poor males only [ ] 6= Both poor females and males [ ] 7= Physically challenged females only [ ] 8= Physically challenged males only [ ] 9= Both physically challenged females and males 10= Poor and physically challenged females only [ ] 11= Poor and physically challenged males only [ ] 12= Both poor and physically challenged males and females [ ] 13= Others [ ] (specify)----------

4. If you have more than one target group, please rank them in terms of importance using 1 as the most important.

Target group	**Rank**

5. So far, what problems have you encountered working with groups in your organisation?

---

6. How have you responded towards the solution of these problems?

---

7. In view of the fungibility of loans do you have any monitoring mechanisms in place to ensure that clients use the loans obtained successfully for the intended purpose? 1=Yes [ ] 2=No [ ]

8. If yes to Q7, what monitoring mechanisms have you put in place to ensure the success of loans delivered to clients?

   ---

9. What strategies have you adopted to enhance loan recovery among recipients?

   ---

10. Kindly state the difficulties encountered in retrieving loans from clients (if any).

    ---

11. State how these difficulties are currently being addressed.

12. Do you have any arrangements in place which provide training to your clients? 1=Yes [ ]
    2=No [ ]

13. If yes to Q12, kindly describe such an arrangement, indicating the following
    Trainer(s) ---

    Beneficiaries: ---

    Duration of training ---

    Topics (or areas covered) ---

    Location of training ---

Payments (who bears the cost) ----------

14. Would you have preferred new training arrangements for your clients? 1=Yes [ ] 2=No [ ]
15. If yes to Q14, what is inadequate about the current arrangement and what type of arrangement would you have preferred?
    - Inadequacy: ----------

    - Preferred arrangement: ----------

      ----
16. What factors do you consider in fixing the size of your interest rate for loans?

    ----
17. Apart from the strategies mentioned earlier (i.e. group formation, client training, monitoring and loan recovery) have you put in place any other strategies to reach out to your clients and enable them and your organisation benefit from giving them loans? 1=Yes [ ] 2=No [ ]
18. If yes to Q17, kindly indicate those strategies.

    ----
19. Why do you have those strategies in place?

    ----
20. Would you have preferred a different strategy to reach your clients? 1=Yes [ ] 2=No [ ]
21. If yes to Q20, what strategies would you have preferred in reaching out to your clients and why?

Strategy: ----------

Reasons: ----------

---

22. What problems does your organisation face in delivering microfinance to its targeted clients?

---

23. What suggestions would you provide to improve on the outreach and delivery of microfinance services in your institution?

---

24. What are the strengths and weaknesses of your institution?
Strengths:----------

Weaknesses:----------

---

25. What are the opportunities and threats of your institution?
    Opportunities:----------

    Threats:----------

Respect for local culture:

26. Does your institution take care that its actions are compatible with the local culture and values (through surveys and studies, through discussions with local authorities, key resource persons from the community, etc.) of the community? 1=Yes [ ] 2=No [ ]
27. Does your institution work with local loan officers who can speak the local language and know the local culture? 1=Yes [ ] 2=No [ ]
28. Does your system incorporate any indigenous microfinance practices (eg. Family and social ties, group solidarity etc.)? 1=Yes [ ] 2=No
29. If yes, indicate and rank indigenous practices your system has incorporated

Indigenous Practice	**Rank (by ticking)**			
	Very Low	**Low**	**High**	**Very High**

30. Rank the overall level of influence of indigenous microfinance systems on the operations of your institution: 1= very low, 2= low, 3= high, and 4= very high
31. Do you know of any indigenous microfinance arrangements in your society or community (such as share cropping, provision of seed and farm

implements to relatives, provision of assistance to in-laws in cash or kind, group farming etc)? 1= Yes [ ] 2= No [ ]

32. If yes, name them? (Please name many indigenous/indigenous arrangements/systems)

S/N	Name
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

33. Rank the following performance indicators with respect to the performance of your institution in each of them.

Indicator	Rank (by ticking)			
	Very Low	Low	High	Very High
Financial sustainability				
outreach to the poor				
Outreach to the excluded (women, illiterate individuals, etc.)				
Positive effect on income of clients				
Positive effect on education and social status of clients and their family members				
Positive Effect on indigenous economic activities				
Positive effect on consumption				
Positive effect on assets acquisition of clients				

Range of services

34. How many different types of loan products does your system provide? Provide names of types; ----------

---

---

35. How many different types of voluntary savings products does the MFI provide? ----------
36. Does the MFI provide insurance products? 1= Yes [ ] 2= No [ ]
37. If yes, name them ----------

Clients Representatives

38. Do the clients of the MFI elect representatives to any representative body in:
    - Consultation 1=Yes [ ] 2=No [ ]
    - Decision making 1=Yes [ ] 2=No [ ]
    - Control of the institution 1=Yes [ ] 2=No [ ]
39. Do these bodies have an effective impact on decision-making and actions of the MFI management? 1=Yes [ ] 2=No [ ]
40. How often do these bodies meet staff managers? ……...
41. Is there a system of rotation of the elected members? 1=Yes [ ] 2=No [ ]
42. Is there a system of training of representatives / elected members? 1=Yes [ ] 2=No [ ]
43. What is the percentage of women among client representatives (compared to % of women among all clients)?
    …….

Appendix 54: Institutional Questionnaire for Manager of Institution

INSTITUTIONAL QUESTIONNAIRE (Manager's Copy)

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF INTEGRATED DEVELOPMENT STUDIES

DEPARTMENT OF AFRICAN AND GENERAL STUDIES

This questionnaire is seeking your opinion to solicit information to write a thesis on the topic: "A **Comparative Analysis of indigenous and formal Microfinance Systems in the Upper West Region of Ghana"**

The findings of this study will generate information necessary for the planning of appropriate interventions and help fill the information gap and inform decision makers, planners, researchers and practitioners about the impact of microfinance intervention on the welfare of households, as well as the community. Your honest and genuine participation by responding to the questions is highly appreciated. You are assured that information provided will be treated as strictly confidential and will be used *only* for the purpose of the academic research.

Date ----------

Institution and Loan Information

44. Name of institution ----------Year of formation----------

45. Kindly list and rank (in order of importance) your major services provided to clients in terms of the priority you attach to these services. (e.g. of areas of operation include microcredit, enterprise development, etc.)

Areas of Operation	**Rank**

46. State the specific objectives you wish to achieve in your microfinance activities

---

---

47. Kindly indicate the socio economic status of your target group. 1= Females only [ ] 2= Males only [ ] 3= Both females and males [ ] 4= poor females only [ ] 5= poor males only [ ] 6= Both poor females and males [ ] 7= Physically challenged females only [ ] 8= Physically challenged males only [ ] 9= Both physically challenged females and males 10= Poor and physically challenged females only [ ] 11= Poor and physically challenged males only [ ] 12= Both poor and physically challenged males and females [ ] 13= Others [ ] (specify)----------
48. If you have more than one target group, please rank them in terms of importance using 1 as the most important.

Target group	**Rank**

49. Which types of loans do you offer? 1= Consumption loans only [ ] 2= Production loans only [ ] 3=Both production and consumption loans (general purpose loans) [ ] 4= Others [ ] Specify (e.g. funeral or marriage loans) ----------

50. Provide details of the type of loans you offer below (loan types, activities targeted, interest rates, loan duration, and repayment schedule).

Loan type	Maximum Loan size	Maximum Loan size	Activities targeted	Loan duration	Repayment schedule	Current Interest rate
Consumption						
Production						
Gen. purpose						
Others						

51. Which other microfinance services do you offer apart from loans? 1= Savings [ ] 2=Remittances [ ] 3= Insurance [ ] 4= Payment of Services [ ] 5= Health Insurance [ ] 6= Others [ ] (specify) ……

52. Kindly state the eligibility criteria for selecting clients who qualify for loans by filling in the relevant columns below.

Loan type	Sex Male, female or both	Minimum age in years	Group Yes, No, or either	Minimum savings req'ts	Collateral req'ts other than guarantors	Guarantors No. and min. qualification	Other req'ts
Consumption							
Production							
Gen purpose							
Others							

53. Kindly state any explanations you may wish to give to qualify your responses to Q8 and Q9 here.

---

54. If your organisation deals with groups, kindly indicate any criteria for the group formation and management (including group size, qualification for

membership, meetings, etc. Kindly attach any documents or photocopy of documents indicating group formation and management if available)

55. So far, what problems have you encountered working with groups in your organisation?

---

56. How have you responded towards the solution of these problems?

How many groups applied for loan last financial year? ----------

57. Indicate the period of last financial year. From---------- To----------

DD/MM/YYYY D/MM/YYYY

58. How many of these groups were able to obtain loans last financial year? ----
59. How many individuals applied for loans last financial year? ----------
60. How many of these individuals were able to obtain loans last financial year? ----------
61. What percentage of loan applicants last financial year are women? ----------
62. On the whole what percentage of these categories of loan applicants were able to obtain all the amounts they asked for last financial year? Groups: ---------- individuals ----------
63. On the whole, what percentage of loans applied for were given out last financial year? ----------
64. Kindly state any explanations you may wish to give to qualify your responses to Q20 and Q21 above.

---

65. Kindly state the reasons for the rejection of any loan applications

---

---

66. Does your system accept to provide loans only secured by "social" collateral (i.e. solidarity among groups, recommendation by trusted third party,

physical guarantees which have very low commercial value but are important for the borrowers)? 1=Yes [ ] 2=No [ ]

67. Do you have staff on the ground who organise your clients? 1=Yes [ ] 2=No [ ]
68. In view of the fungibility of loans do you have any monitoring mechanisms in place to ensure that clients use the loans obtained successfully for the intended purpose? 1=Yes [ ] 2=No [ ]
69. If yes to Q26, what monitoring mechanisms have you put in place to ensure the success of loans delivered to clients?

    ---

70. What strategies have you adopted to enhance loan recovery among recipients?

    ---

71. Kindly state the difficulties encountered in retrieving loans from clients (if any).

    ---

72. State how these difficulties are currently being addressed.

    ---

73. What factors do you consider in determining the size of loan to clients?

    ---

74. What accounts for your inability to provide the total size of the loan requested (if applicable).

---

75. Do you have any arrangements in place which provide training to your clients? 1=Yes [ ] 2=No [ ]

76. If yes to Q33, kindly describe such an arrangement, indicating the following
    Trainer(s) ----------

    Beneficiaries: ----------

Duration of training ----------

Topics (or areas covered) ----------

Location of training ----------

Payments (who bears the cost) ----------

77. Would you have preferred new training arrangements for your clients? 1=Yes [ ] 2=No [ ]
78. If yes to Q35, what is inadequate about the current arrangement and what type of arrangement would you have preferred?
    - Inadequacy: ----------
    - Preferred arrangement: ----------
      ----
79. What factors do you consider in fixing the size of your savings rate?

    ----
80. What factors do you consider in fixing the size of your interest rate for loans?

    If you have been subsidizing your loans, kindly explain why.

    If you have been subsidising your loans, how have you been financing the subsidy?

81. Apart from the strategies mentioned earlier (i.e. group formation, client training, monitoring and loan recovery) have you put in place any other strategies to reach out to your clients and enable them and your organisation benefit from giving them loans? 1=Yes [ ] 2=No [ ]
82. If yes to Q41, kindly indicate those strategies.

    Why do you have those strategies in place?
    ----
83. Would you have preferred a different strategy to reach your clients? 1=Yes [ ] 2=No [ ]
84. If yes to Q44, what strategies would you have preferred in reaching out to your clients and why?
    Strategy: ----------

    Reasons: ----------
    ----

85. What problems does your organisation face in delivering microfinance to its targeted clients?

    ---

86. What suggestions would you provide to improve on the outreach and delivery of microfinance services in your organisation?

    ---

87. What are the strengths and weaknesses of your institution?
    Strengths:---

    Weaknesses:---
    ---

88. What are the opportunities and threats of your institution?

    Opportunities:---

    Threats:---

Range of services

89. How many different types of loan products does your system provide?
    Provide names of types; ---

    ---

90. How many different types of voluntary savings products does the MFI provide? ---

91. Does the MFI provide insurance products? 1= Yes [ ] 2= No [ ]

92. If yes, name them

    .....

.....

.....

.....

93. **Respect for local culture:**

94. Does your institution take care that its actions are compatible with the local culture and values (through surveys and studies, through discussions with local authorities, key resource persons from the community, etc.) of the community? 1=Yes [ ] 2=No [ ]

95. Does your institution work with local loan officers who can speak the local language and know the local culture? 1=Yes [ ] 2=No [ ]

96. Does your system incorporate any indigenous microfinance practices (eg. Family and social ties, group solidarity etc.)? 1=Yes [ ] 2=No [ ]

97. If yes, indicate and rank indigenous practices your system has incorporated

Indigenous Practice	**Rank (by ticking)**			
	Very Low	**Low**	**High**	**Very High**

98. Rank the overall level of influence of indigenous microfinance systems on the operations of your institution: 1= very low, 2= low, 3= high, and 4= very high

99. Is your institution willing to use money lenders or susu operators in its operations? 1=Yes [ ] 2=No [ ]

100. Give reason(s) for your answer to 63

---

101. Do you know of any indigenous microfinance arrangements in your society or community (such as susu, share cropping, provision of seed and farm implements to relatives, provision of assistance to in-laws in cash or kind, group farming etc)? 1= Yes [ ] 2= No [ ]

102. If yes, name them? (Please name many indigenous arrangements/systems)

S/N	**Name**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

103. Rank the following performance indicators with respect to the performance of your institution in each of them.

Indicator	Rank (by ticking)			
	Very Low	**Low**	**High**	**Very High**
Financial sustainability				
outreach to the poor				
Outreach to the excluded (women, illiterate individuals, etc.)				
Positive effect on income of clients				
Positive effect on education and social status of clients and their family members				
Positive Effect on indigenous economic activities				
Positive effect on consumption				
Positive effect on assets acquisition of clients				

Clients Representatives

104. Do the clients of the MFI elect representatives to any representative body in:

- Consultation 1=Yes [ ] 2=No [ ]
- Decision making 1=Yes [ ] 2=No [ ]
- Control of the institution 1=Yes [ ] 2=No [ ]

105. Do these bodies have an effective impact on decision-making and actions of the MFI management? 1=Yes [ ] 2=No [ ]

106. How often do these bodies meet staff managers? ……..

107. Is there a system of rotation of the elected members? 1=Yes [ ] 2=No [ ]

108. Is there a system of training of representatives / elected members? 1=Yes [ ] 2=No [ ]

109. What is the percentage of women among client representatives (compared to % of women among all clients) ? ……..

Appendix 55: Household Questionnaire

HOUSEHOLD QUESTIONNAIRE

UNIVERSITY FOR DEVELOPMENT STUDIES

FACULTY OF INTEGRATED DEVELOPMENT STUDIES

DEPARTMENT OF AFRICA AND GENERAL STUDIES

HOUSEHOLD QUESTIONNAIRE

This questionnaire is seeking your opinion to solicit information to write a thesis on the topic "**Comparative Analysis of indigenous and formal Microfinance Systems in the Upper West Region of Ghana"** The findings of this study will generate information necessary for the planning of appropriate interventions and help fill the information gap and inform decision makers, planners, researchers and practitioners about the effects of microfinance intervention on households and other microfinance issues in the region. Your honest and genuine participation by responding to the questions is highly appreciated. You are assured that information provided will be treated as strictly confidential and will be used *only* for the purpose of the academic research.

A. GENERAL INFORMATION

1	Date and time of interview	Date: Start time……... End time……..
2	Name of the Interviewer	
3	Name of respondent	
4	Community	
5	District	
6	Lending Institution	
7	Name of group if joint liability	

B. SOCIO-DEMOGRAPHIC INFORMATION

(Responses to be preferably provided by the primary decision maker/household head)

Household composition									
S/N	**1. Relationship**	**2. Sex**	**3. Age**	**4. Education level**	**5.Marital Status**	**6. NHIS**	**7. Religion**	**8. Major Occ.**	**9. Minor Occ.**
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

Key : Sex: 1=Male; 2=Female
Relation to head of household (HHH): 1=head, 2=beneficiary, 3=spouse, 4= child, 5=relative, 6= daughter in Law, 7= grandchild, 8= parent, 9=sibling, 10= Other, specify……
Marital Status: 1=Married, 2=Widowed 3=divorced/separated, 4 Single (Never married)

School: 1= none, 2= adult literacy, 3=Primary, 4=JHS, 5= form four leaver 6= SHS, 7= Vocational/ Technical 8=Tertiary
Religion: 1=Christianity, 2= Islam, 3= Traditional
Major and Minor Occupations: .1=Arable crop farming, 2= Tree crop farming, 3= Livestock farming,4= Fishing 5= Produce marketing (Crop), 6= Livestock marketing (incl. produce),7= Pito brewing, 8= Shea butter processing, 9=Malt processing, 10= Petty trading, 11= Salaried worker,12=Tradesman (Bricklayer, carpenter, tailor etc), 13=Artisan (basket weaver, potter etc.), 14= Driver 15= Tractor operator 16= Food Vendor 17=Fuel vendor 18= Sales man/woman 19= Schooling, 20= Unemployed, and 21= Others (specify)……
……

Health Insurance: 1= Yes 0= No

10. (**For beneficiary only**): Number of years spent to reach the level of education indicated above.....

11. Number of children of school going age … Number in school…….....Number not in school……

12. Give reasons for children not in school

    .....

    .....

    ....

13. If no to NHIS above why?

    ……

    ….....

    .....

14. What was the value of your income in 2015?

    .....

    .....

    .....

15. What was the value of income of HH for 2015?

    ……

    ……

    ……

Household Income (2015)						
Source	**Household Member**					**Total (GH¢)**
	Head	**1***	**2**	**3**	**4**	
Major occupation						
***a. Food Crops**:* e.g. cassava, yam, millet, sorghum, rice, pepper, tomato, beans, etc.						
***a. Cash crops**:* e.g. soybeans, cotton, tobacco, etc.						
***c. Natural Resource**:* e.g. hunting, fishing , fire wood, etc.						
d. Livestock: e.g. goat, sheep, chicken, cattle etc.						
e. Non-farm wage income: e.g. security etc.						
f. Self-employed income: e.g. trading, artisan, carpentry, pito brewing etc.						
Minor occupation						
***a1. Food Crops**:* e.g. cassava, yam, millet, sorghum, rice, pepper, tomato, beans, etc.						
***b1. Cash crops**:* e.g. soybeans, cotton, tobacco, etc.						
***c1. Natural Resource**:* e.g. hunting, fishing , fire wood, etc.						
d1. Livestock: e.g. goat, sheep, chicken, cattle etc.						
e1. Non-farm wage income: e.g. security etc.						
f1. Self-employed income: e.g. trading, carpentry, pito, etc.						
Total (GH¢)						

NB. Use 1* for beneficiary.

16. Roofing of the main house: 1=Grass thatch [ ] 2=Corrugated iron sheets [ ] 3=Mud [ ] 4=Other (specify) ……..
17. Walls of the main house: 1=Burnt brick with plaster [ ] 2=Burnt brick without plaster [ ] 3=Sun dried brick with plaster [ ] 4=Sun dried brick without plaster [ ] 5=Mud and poles [ ] 6=cement blocks with plaster [ ] (7) cement blocks without plaster [ ]
18. Floor of the main house: 1=Cement [ ] 2=Earth [ ] 3= Tiles [ ] 4= Other (specify)……
19. Does the household have a toilet or a pit latrine? 1=Yes [ ] 2= No [ ]
20. Where does the household get drinking water? 1= Open river [ ] 2= Untreated borehole water [ ] 3= Has a running tap [ ] 4= Buys from water vendor [ ] 5= others……
21. What is your source of cooking fuel? 1= fire wood [ ] 2= Charcoal [ ] 3= Kerosene [ ] 4= Gas [ ] 5= Electricity [ ] 6= Other (specify)…….
22. What is your source of lighting? 1= Lantern [ ] 2= electricity [ ] 3= Other (specify) ……

C. INFORMATION ON MICROFINANCE LOANS AND SYSTEMS

23. Which microfinance institution did you apply for and receive your current loan from? 1= Rural bank [ ] 2= Credit Union [ ] 3= Susu operator [ ] 4= Money lenders [ ] 5= Other [ ] Specify…….....
24. What type of loan did you have access to? 1= Individual loan [ ] 2= Group [ ] 3= Other [ ] specify.....
25. If group loan, how many were you in the group? .....
26. When did you receive the current loan? Month..... Year.....
27. What is the duration of repayment (in years) of the current loan? .....
28. What is the interest rate on your current loan? ……
29. For what reason did you go for the current loan? 1= To start a business [ ] 2= To expand my business [ ] 3= To pay back another loan [ ] 4= To pay fees [ ] 5= Other [ ] (specify)…….....
30. If business, indicate the type of business 1= Agribusiness (crop) [ ] 2= Agribusiness (livestock) [ ] 3= Food vending [ ] 4= Pito brewing [ ] 5= Smock weaving [ ] 6= Other [ ] (specify) …….....
31. Do you have access to microfinance information (products and services) 1=Yes [ ] 0= No [ ]

32. For how long have you been accessing loans from this institution?

No.	Amount (GH¢)	Interest Rate	Repayment period
First loan			
Second loan			
Third loan			
Fourth loan			
Fifth loan			
Current			

33. Was collateral required for your current loan? 1= Yes [ ] 0 = No [ ]
If yes, what type of collateral was required? 1= group solidarity, 2= Compulsory savings, 3= Assets and 4= Others (Specify) ----------

34. What is your repayment schedule for the current loan? 1= Daily [ ] 2= Weekly [ ] 3= Fortnightly [ ] 4= Monthly [ ] 5= Quarterly [ ] 6= Every 6 months [ ] 7= Annually [ ] 8= Other [ ] (Specify) …….....

35. What is the amount of repayment for the current loan according to your repayment schedule? …….....

36. How /will you repay your current loan? 1= Proceeds from business [ ] 2= Sale of some property [ ] 3= Transfer payments from relatives [ ] 4= Get other debts [ ] 5= Other [ ] (specify)……

37. If sale of property what exactly did you sell? 1= Farm animals eg goats cows etc [ ] 2= House hold electronic eg radio [ ] 3=House hold furniture [ ] 4= Other [ ] (specify)…….....

38. What is the maximum distance (in km) you travel to receive a loan or make a deposit? .....

39. Is there any microfinance clients' group or any such group that organises people for the purpose of acquiring loans? 1= Yes [ ] 0= No [ ] If no, << 48

40. If yes, do you belong to such group(s)? 1= Yes [ ] 0= No [ ]
41. If yes, give the name of the group.....
42. How often do you meet to discuss loans matters and related issues? 1= Weekly [ ] 2= Fortnightly [ ] 3= Monthly [ ] 4= Quarterly [ ] 5= Annually [ ] 6= Other [ ] specify.....
43. Have your group members ever exerted pressure to make you pay for loans which you would have otherwise failed to pay? 1=Yes [ ] 2= No [ ]
44. If yes what kind of pressure? 1= threatened to confiscate my property [ ] 2= Sold some of my property [ ] 3= Reported me to some authority [ ] 4= Others [ ] (specify) …….....
45. Has the MFI ever used tools (such as meetings, surveys or focus groups discussions) to involve its clients in the design of the services provided? 1= Yes [ ] 2= No [ ]
46. Which of the following non-financial services (within the same organisation or thanks to formal partnership and cooperation with other local organisation) do you have access to? 1= Basic book keeping [ ] 2= Business training [ ] 3=Access to market [ ] 4= Innovation [ ] 5= Literacy training [ ] 6= Other [ ] Specify …….. .....

D. INFLUENCE OF INDIGENOUS MICROFINANCE PRACTICES ON FORMAL AND SEMI-FORMAL MICROFINANCE SYSTEMS

47. Does the MFI take care that its actions are compatible with the local culture and values (through surveys and studies, through discussions with local authorities, key resource persons from the community, etc.)? 1= Yes [ ] 0= No [ ]
48. Does the MFI work with local loan officers who can speak the local language and know the local culture? 1= Yes [ ] 0= No [ ]
49. Does the system incorporate any indigenous microfinance practices (such as social/family ties, group solidarity etc)? 1= Yes [ ] 0= No [ ]
50. If yes, name them?

S/N	Name
1	
2	
3	
4	
5	
6	

51. Do you know of any indigenous microfinance arrangements in your society or community (such as share cropping, provision of seed and farm implements to relatives, social donations in times of need (eg. during funerals), borrowing from friends and relatives, susu, provision of assistance to in-laws in cash or kind, group farming, provision of crop and animal breeds to friends and relatives etc)? 1= Yes [ ] 0= No [ ]

52. If yes, name them? (Probe very well for indigenous/indigenous arrangements/systems)

S/N	Name
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

E. HOUSEHOLD ASSETS AND EXPENDITURE

Household Expenditure	
53. Indicate the amount of household expenditure on the following areas from the period since you started receiving loans from microfinance institutions including the current loan.	
Source	**Amount/annum (GH¢)**
Food (weekly)	
Education	
Health	
Clothing	
Fuel (Monthly)	
Shelter	
Other (specify)	
Other (specify)	
Other (specify)	
Total	

Household Assets			
54. Indicate the quantity and current price of any of the following assets that you have from the time you started enjoying microfinance loans			
Asset	**Quantity**	**Current Price (GH¢)**	**Value (GH¢)**
Agriculture			
Cutlass			
Hoe			
Cattle			
Sheep			
Goat			
Pig			
Donkey			
Spraying machines			
Traction implements			
Wellington boots			
Storage facility			
Tractor			
Sickle			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Non-agriculture			
Radio			
Mobile phone			
Bicycle			
Motor bike			
DCD/VCD player			
TV			
Generator			
Sewing machine			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			
Other (specify)			