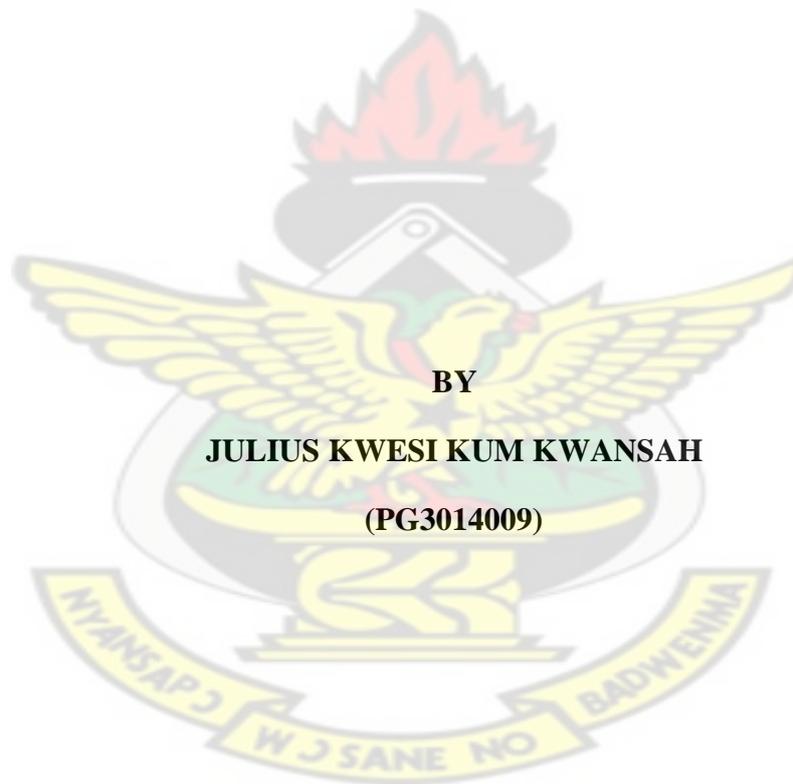


KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

INSTITUTE OF DISTANCE LEARNING

**IMPACT OF MICRO-CREDIT ON BUSINESS INCOME:
A CASE STUDY OF WOMEN IN THE AGONA DISTRICTS**



BY

JULIUS KWESI KUM KWANSAH

(PG3014009)

JULY, 2011

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**A THESIS SUBMITTED TO THE INSTITUTE OF DISTANCE LEARNING,
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
KUMASI IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF SCIENCE INDUSTRIAL MATHEMATICS**

JULY, 2011

DECLARATION

I hereby declare that this submission is my own work towards the MSc. Industrial Mathematics and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university, except where due acknowledgement has been made in the text.

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STUDENT NAME & ID

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DATE

CERTIFIED BY:

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SUPERVISOR'S NAME

SIGNATURE

DATE

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SIGNATURE

DATE

DEDICATION

This work, first and foremost, is dedicated to my parents M. J. Kwansah and Mercy Osei-Bempong of Agona Swedru and Akim Oda respectively. Second, to my children, Kelvin Kojo Kum Kwansah, Nana Kwesi Kum Kwansah and Belinda Yaa Aso Kwansah, that even the sky should never be their limit!

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ACKNOWLEDGEMENT

I wish to express my deepest gratitude to the Almighty God whose mercy and fortitude has brought me this far. My special debt of appreciation goes to my supervisor, **Mr. Dadson Awunyo Vitor** of KNUST Business School, for his relentless and selfless sacrifices to ensure I complete the programme successfully, sometimes against his very tight schedules. May the good Lord replenish all that he has lost.

To the microfinance institutions in Agona Swedru and my faithful respondents who completed their questionnaires. Many thanks also go to Mr. Osei Bonsu of Agona Swedru and Mr. E.Y. Apedo of U.S.A., for their immense financial assistance that saw me complete this Master's programme.

The encouragement and support of Mr. David Aning Yebo, my Headmaster, towards my successful completion of the programme cannot elude mention. My appreciation will not be complete without the mention of **Comfort Kwansah (MRS)**, my wife, whose persistent reminders and encouragement propelled me to complete the programme, especially, in the writing of this thesis.

Finally, to all others whose prayers, encouragement in several other ways saw me through to the end of the programme, I say *thankyou*. Key among them is Mr. Solomon Darko-Quarm, and to all those whose work have been cited in one way or the other in this study, I extend my greatest appreciation and due acknowledgement.

ABSTRACT.

Access to adequate and affordable credit for businesses remains one of the key challenges to local economic development in Ghana, despite efforts by both government and private sector organisations since independence in 1957 to address the problem. *The study* examines women's access to micro credit and impact of credit on income from formal financial institution in Agona East and West districts of Central Region of Ghana.

A set of questionnaire was administered to 200 women. In addition, managers and credit officers of formal financial institutions operating in these districts were interviewed. Focus group discussion was used to supplement the questionnaires. Data analysis followed a two prong approach by making use of both qualitative and quantitative techniques. For the qualitative analysis, descriptive statistics such as percentages, means, frequencies and cross tabulations were used. In the case of quantitative analysis logit, and propensity score matching were employed.

The result revealed that formal education, perception of application procedures, level of income, farm size, membership to economic associations, savings with financial institutions the type of business, the perception of interest charged and the distance from respondents' residence to the financial institution are the factors that influence respondents' probability of access to micro credit from the financial institutions. Furthermore, access to credit has significant impact on income.

In order to increase access to micro credit there is the need for education of the woman and they should be encouraged to join groups. They should also be encouraged to undertake savings. The government needs to play a role by creating incentive packages for these institutions to facilitate credit provision to the women.

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CHAPTER ONE

BACKGROUND TO THE STUDY

1.0 INTRODUCTION

Microfinance is the supply of loans, savings and other financial services to poor people. In order to run their own businesses people need capital and financial services like savings, money transfer systems, insurance, pensions and information for helping stabilizing their consumption and shield themselves against risks. The definition of micro credit refers to loans made to borrowers who need more than just a loan. With money only, it is difficult to start up or expand businesses. There is a need for service like insurance, transactions services, self – employment services and instructions for starting up small businesses. The term ‘microfinance’ covers micro credit and those financial services. Special institution delivers this microfinance to people who lack collateral. Commercial Banks see developing countries not as a profitable market. High transaction costs and risks are the main problems why microfinance is not yet a product of some commercial banks.

In addition to the transaction costs there are, numerous risk in extending micro credit. The first risk is adverse selection; the individuals hide information or supply wrong information. The second is the possibility that, moral hazard problems exist. This is that Financial Institutions are unaware of the intentions of the clients. To decrease these risks, several solutions exist. One of them is group lending. Group lending refers specifically to arrangements by individuals, without collateral who get together and form groups with the aim of obtaining loans from a lender. The special feature is that loans are given to individuals but the consequences are for the whole group. For example, if an individual has problems with repayments, the whole group will bear

the consequences. Group lending therefore, overcomes the moral hazards problem. The group members, who often live closely together, can impose social and economic sanctions on defaulting individuals. The main features of the microfinance institution which differentiate it from commercial banks are (1) It is a substitute for informal credit (2) It generally requires no collateral (3) it has simple procedures and less documentation. (4) It is mostly grouped lending (5) it has easy and flexible repayment schemes (6) it offers financial assistance to members of the group in case of emergency (7) the most deprived segments of the population are efficiently targeted.

1.1 Overview of Microfinance In Ghana

Prior to formal banking system in Ghana, many of the poor, mainly women and those in rural communities relied heavily on informal banking services and the semi-formal savings and loan schemes. (Botei-Doku Ellen and E. Aryettey(1996)). The mission of the formal micro credit organizations or microfinance services in Ghana was to provide social and economic support for the less advantaged especially, rural women and their families. For some known as Susu, there were weekly meetings: each woman donates a set sum of money to a common pot that is given to one woman each week. The pot is rotated uniformly until all members are served. Credit unions were introduced in 1955 when father Peter Poreku Dery, a catholic priest founded a co-operative credit union in Jirapa in the Upper Region (now Upper West Region) of Ghana. It followed the German concept developed in 1846. The objective was to encourage thrift and savings among members. A credit union enables the poorest in a community to save and access loans for income generating activities.

1.1.1. Private Participation

The Ghana Microfinance Institution Network (GHAMFIN) was established in 1998 as an umbrella organization for regulated and non-regulated micro credit institutions now numbering over 70. The most successful micro credit institution in Ghana, with the largest number of clients (16,000) is Sinapi Aba Trust (STA). Other well known ones are Women's World Banking, Pro-credit Ltd., Opportunity International, Ezi savings and Loans, Uni Credit, First National and Express Savings and Loans. The need for a strategic plan to clarify the mission and goals of microfinance and to strengthen stakeholder's linkages led to the development of a draft policy for microfinance in 2006.

1.1.2. Microfinance And Livelihood Of The Rural Poor

The impact of microfinance on the livelihood of the poor is looked out from two dimensions. The first is the opportunity created by the microfinance system for people to save, borrow or engage in other financial activities. The second dimension is the application of proceeds from production due to access to credit.

The issue of effectively educating the people to understand the financial system then becomes critical. When people are not well informed they can act in ways that are not beneficial to their livelihoods. For instance a study by Akudugu in 2009 showed that women in the upper East region who perceived that high education is a requirement for accessing credit from financial institutions were less likely to successfully access credit.

The impact of microfinance in Ghana is a subject worthy of serious examination for a number of reasons. Since the inception of MFIs in Ghana their activities have grown from strength to strength although up to date data on MFIs in Ghana are not readily

available. According to Ghana Microfinance Network (GHAMFIN), the organization which coordinates the activities of MFIs, in Ghana there were about 233 regulated and non-regulated MFIs in Ghana as at 2001.

1.2 Statement Of The Problem

Microfinance over the years has been considered to be one of the most effective and flexible strategies in the fight against global poverty. It is said to be sustainable and can be implemented on the massive scale necessary to respond to urgent needs of those living on less than \$1 a day, the World's poorest (GHAMFIN, 2005). It has been seen to be promoting economic growth since loans given are supposedly used in investing in micro business.

The aim of this study shall be to investigate the extent to which microfinance scheme have impacted positively or otherwise on their clients in the Agona East district and the Agona West municipality of the Central Region of Ghana. The issues at stake now is not about how many MFIs we have in Ghana or where they are found in Ghana, but it is about what they are supposed to do. The issue is, are these MFIs having any impact on the lives of people in the areas where they are operating? It is for this reason that this study is being undertaken.

The problem then is to investigate the impact of microfinance on business performance and poverty alleviation of the poor people, especially women of these two districts engaged in small scale businesses. Agona East and West Districts are found in the Central Region of Ghana which is among the poorest Regions in the country.

1.3. Objective Of The Study

The general objective of the study is to assess the impact of micro-finance on households and their small business enterprises in the Agona East District and the Agona West municipality of the Central Region of Ghana.

The specific objectives of the study are to:

1. Identify financial institutions operating in the study area and describe credit package offered to the respondents.
2. Determine the extent to which women are able to access micro credit offered by the financial institutions
3. Determine the factors that influence access to micro credit from financial institutions.
4. To evaluate the impact of access to micro credit on income levels

1.4 Main Research Questions and Sub-Questions:

This study seeks to understand how microfinance interventions are implemented and how the various components of the interventions affect households and businesses of service users. In this context the overall research question of this thesis is: how do access to microfinance affect the general welfare by improving income levels in the area under consideration? To answer the research question, three main sub-questions were formulated.

1. Which institutions are providing microfinance services within the study area?
2. To what extent are women able to access micro-credit from the financial institutions?

3. What is the effect of lending policies of microfinance institutions on access to micro-credit?

4. What is the impact of access to microfinance on business performance?

1.5 Limitations Of The Study

This study investigated the research problem based on the activities of microfinance users and institutions. Due to time and content limitation, only data in line with the purpose of this study was considered. There might have also been some limitation in the sampling process in choosing a certain number of the total population. The method chosen for this study might have some limitations also in answering the research questions. Some other things to consider as limitation during this study are in relation with the people chosen for the study. Some of them were not interested in being interviewed and felt reluctant also in filling the questionnaire.

1.6 Significance Of The Study

From pragmatic point of view, the importance of every idea or concept is measured by its usefulness or its utility. The study will enable microfinance institutions know factors that militate against their operations and deal with them accordingly. Government will be well informed to come out with policies that will enable the MFLs operate effectively. Empirical evidence suggests that repayment rates may not be good indicators of poverty reduction (see Marr, 2003; Copeland, 2009). This study is deemed important because it intends to put the understanding of microfinance interventions and its effects on households and businesses in the spotlight. Microfinance interventions will become more relevant for development if perceptions of service users are taken into account in the design and implementation of

microfinance interventions. Furthermore, studies that try to systematically link the components of microfinance interventions to household and business effects from the perspective of service users and taking contextual information into consideration are fewer in the microfinance literature. Contributing to the research gap just mentioned is perhaps the most important justification for this study and an innovation in microfinance studies.

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CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section will review definitions and terms in the field of microfinance. There will also be a review of the various theories in microfinance and structures involved in the delivery of microfinance. Microfinance in Ghana will be extensively reviewed.

2.1 Definitions And Concepts Of Microfinance

Microfinance, according to Otero (1999) is “the provision of financial services to low income poor and very poor self-employed people”. These financial services according to Ledgerwood (1999) generally include savings and credit but can also include other financial services such as insurance and payment services. Schreiner and Colombet (2001, p.339) define microfinance as “the attempt to improve access to small deposits and small loans for poor households neglected by banks.” Therefore, microfinance involves the provision of financial services such as savings, loans and insurance to poor people living in both urban and rural settings who are unable to obtain loans from the formal financial sector. Microfinance is an economic development approach that involves providing financial services, through institutions, to low-income clients, where the market fails to provide appropriate services. Microfinance has also been defined as the means by which poor people convert small sums of money into large lump sums (Rutherford 1997). One of the main components of microfinance is microcredit. Micro-saving is also a microfinance service that allows impoverished individuals to safeguard money and other valuables items and even earn interest. It allows a lump sum to be enjoyed in future in exchange for a series of savings made

now. Insurance is an important service in every aspect of life. It is therefore not surprising that micro-insurance is also a component of microfinance.

A microfinance institution (MFI) is an organization, engaged in extending micro-credit loans and other financial services to poor borrowers for income generating and self employment activities. An MFI is usually not part of the formal banking industry or government. It is usually referred to as a NGO (Non-Government Organization). The terms microcredit and microfinance are often used interchangeably, but it is important to highlight the difference between them because both terms are often confused. Microcredit refers to small loans, whereas microfinance is appropriate where NGOs and MFIs supplement the loans with other financial services (savings, insurance, training, etc). Therefore microcredit is a component of microfinance in that it involves providing credit to the poor, but microfinance also involves additional non-credit financial services such as savings, insurance, pensions and payment services. No collateral is required contrary to formal banking practices. Instead of collateral, microfinance intermediaries use alternative methods, like, the assessments of clients' repayment potential by running cash flow analyses, which is based on the stream of cash flows, generated by the activities for which loans are. The basics of lending are to provide a loan today and get it repaid, usually with an interest rate, some time in the future. This natural time delay in a debt contract, as compared to an instant exchange of two goods, makes lending potentially risky (Bardhan and Udry, 1999). In developing countries we observe that individuals that are unable to get loans from formal institutions can still obtain credit from informal lenders. This indicates that informal lenders are able to handle information- and enforcement problems. A study in Ghana and South Africa by (Afrane, 2002) shows that although microfinance

programmes have every potential to improve the conditions of beneficiaries, they also tend to create disturbing negative impacts, if necessary measures are not taken. The challenge, therefore, to MFIs is to be mindful of these negative tendencies so that appropriate steps can be taken to minimize these effects as much as possible. He found that a comparison of the impact situations in both countries reveals that the impact trends and levels were not all that different. However, both positive and negative impacts observed in South Africa were more extreme than those of Ghana. Afrane(2002) concluded that the two impact studies have established that microfinance projects have impacted the businesses and lives of the beneficiaries in several positive ways, particularly in their economic circumstances and access to essential life-enhancing facilities and services.

A report by Hishigsuren, Beard and Opoku (2004) on Client Impact Monitoring of some clients of Sinapi Aba Trust in Ghana, also give an empirical impact of microfinance. A total of 487 clients were sampled. 71% were old clients, 25% were new clients and 4% were old clients who did not receive credit in their first cycle of loan. Out of the total sample, 87% were women. The report showed that there was a significant difference in sales revenue for old clients and new clients. It was reported that there was no significant difference in net profits, savings and expenditure on children education for old clients and new client. Most of the clients were interested in the training programmes offered by SAT. Only 0.4% of the clients complained about interest rate.

The review of the relevant literature on microfinance is important for determining what is known and unknown about the chosen research topic and also keep abreast with current research approaches and trends and debates. The assessment of the state

of knowledge relevant to the research topic is expected to inform the analytical framework, methods of collecting data and analysis.

Microfinance is defined here in relation to its users, rather than in relation to other forms of finance as the supply of savings, credit, insurance and payment services to relatively poor people. Copestake (2007:1).

Rutherford (1999), on the other hand, perceives microfinance as the means by which poor people convert sums of money into large lump sums. Although Copestake and Rutherford's definitions add important dimensions to the definition of microfinance, they do not mention the various services that the poor access through microfinance.

Ledgerwood's definition encapsulates non-financial services, an essential but neglected component in definitions, which enables the poor to make efficient use of microfinance. Gallardo (2002) investigated how microfinance is defined in the Ghanaian context from the perspective of the central bank, the Bank of Ghana (BoG). The Non-Bank Financial Institutions (NBFI) of Bank of Ghana classify microfinance as lending to borrowers with the capacity to support loans of less than GH¢100 and in the case of group lending—with joint and several guarantees of members of the group—for an amount not exceeding GH¢500. With the high level of inflation in Ghana, definitions that give precise figures become out of date after a short while. Buyske (2004) estimates the average global microfinance loan to be around \$400 (about GH¢ 600).

Ledgerwood (1999) argues that microfinance does not aim at just providing services, it is a development tool. Littlefield, Murdoch and Hashemi (2003), Simanowitz and Brody (2004) and UNCDF (2005a) perceive an important role for microfinance in the

achievement of the Millennium Development Goals (MDGs). UNCDF (2005b) argues that microfinance underpins the achievement of many Millennium Development Goals and plays a key role in many of its strategies.

In sum microfinance programmes have reflected the development ideology prevalent during the different epochs. The recent models of microfinance have been shaped by contemporary discourse in development. Thus it is important to understand that as much as it is argued that microfinance is driven by research and innovations, the underlying drivers of change in microfinance have been development ideologies.

2.2 Theories of Microfinance

According to Hulme and Mosley (1996), the proposition that capital investment and other financial services constitute key determinants of economic growth and income improvement continues to drive most development efforts including microfinance. Hulme and Mosley (1996) cite a large number of research results that indicate a strong and positive correlation between growth and the share of investments in GDP. It is precisely this idea that drives microfinance. It is assumed that like the positive relationship between financial investment and economic growth, financial investment in the poor through microfinance services will lead to increased incomes of the poor and ultimately result in poverty reduction (Hulme, 1997). El-Solh (1999) argues that microfinance cannot by itself generate income but should be perceived as an important input in the process of developing micro-enterprises. Microfinance institutions are perceived as important because they fund micro- and small-scale enterprises which are integral to the private sector which in turn are perceived as an engine of growth for the economies of developing countries that have moved from state-directed to market-oriented economies. In addition to the discussed theories

underlying microfinance, another spinoff theory is that of empowerment: the poor become empowered when they participate in microfinance activities (Hashemi, Schuler and Riley 1996; Chester and Kuhn, 2002). By self-selecting themselves into groups and self-managing their groups, and gaining control over the means of making a living, poor people become empowered and independent. Empowerment has been particularly relevant for women who are perceived as being marginalised in most developing countries.

In sum, among the theories that underlie the concept of microfinance it is the economic dimension that stands out as most significant. Poor people are provided with capital which they invest in income-generating activities and make profit. This should result in a virtuous cycle: credit leads to increased production and incomes, and allow for greater consumption and savings, and result in further investment (Meyer, 2002). These theories have not been without criticisms. Microfinance interventions have primarily been assessed through impact assessments. The interest in impact assessment is due to concerns about the effect of microfinance on poverty reduction, enterprise development and economic growth since the claims of the benefits seem to have outstripped the evidence that is currently available (Hulme 1997). Armendariz de Aghion and Morduch (2005) and Hulme (1997) have argued that the impact assessments primarily attempt to answer the question: What would have happened to the service user had the intervention not existed?

2.3 Evolution of the Microfinance Sub-Sector in Ghana

Indeed, the concept of microfinance is not new in Ghana. There has always been the tradition of people saving and/or taking small loans from individuals and groups within the context of self-help to start businesses or farming ventures. For example,

available evidence suggests that the first credit union in Africa was established in Northern Ghana in 1955 by Canadian Catholic missionaries. However, Susu, which is one of the microfinance schemes in Ghana, is thought to have originated from Nigeria and spread to Ghana in the early twentieth century. Over the years, the microfinance sector has thrived and evolved into its current state, thanks to various financial sector policies and programmes undertaken by different governments since independence.

Among these are:

- Provision of subsidized credits in the 1950s;
- Establishment of the Agricultural Development Bank in 1965 specifically to address the financial needs of the fisheries and agricultural sector;
- Establishment of Rural and Community Banks (RCBs), and the introduction of regulations such as commercial banks being required to set aside 20% of total portfolio, to promote lending to agriculture and small scale industries in the 1970s and early 1980s;
- Shifting from a restrictive financial sector regime to a liberalized regime in 1986;
- Promulgation of PNDC Law 328 in 1991 to allow the establishment of different categories of non-bank financial institutions, including savings and loans companies, and credit unions.

2.4 Microfinance and Development

Microfinance encompasses the provision of financial services and the management of small amounts of money through a range of products and a system of intermediary

functions that are targeted at low income clients. It includes loans, savings, insurance, transfer services and other financial products and services. Microfinance is thus one of the critical dimensions of the broad range of financial tools for the poor, and its increasing role in development has emanated from a number of key factors that include:

- The fact that the poor need access to productive resources, with financial services being a key resource, if they are to be able to improve their conditions of life;
- The realization that the poor have the capacity to use loans effectively for income-generation, to save and re-pay loans;
- The observation that the formal financial sector has provided very little or no services to low-income people, creating a high demand for credit and savings services amongst the poor;
- The view that microfinance is viable and can become sustainable and achieve full cost recovery;

The literature suggests that micro- finance creates access to productive capital for the poor, which together with human capital, addressed through education and training, and social capital, achieved through local organization building, enables people to move out of poverty. By providing material capital to a poor person, their sense of dignity is strengthened and this can help to empower the person to participate in the economy and society (Otero, 1999).

The aim of micro-finance according to Otero (1999) is not just about providing capital to the poor to combat poverty on an individual level, it also has a role at an

institutional level. It seeks to create institutions that deliver financial services to the poor, who are continuously ignored by the formal banking sector. Littlefield and Rosenberg (2004) argue that the poor are generally excluded from the financial services sector of the economy so MFIs have emerged to address this market failure. By addressing this gap in the market in a financially sustainable manner, an MFI can become part of the formal financial system of a country and so can access capital markets to fund their lending portfolios, allowing them to dramatically increase the number of poor people they can reach (Otero, 1999). More recently, commentators such as Littlefield, Murdugh and Hashemi (2003), Simanowitz and Brody (2004) and the IMF (2005) have commented on the critical role of micro-credit in achieving the Millennium Development Goals. However, some schools of thought remain skeptical about the role of micro-credit in development. For example, while acknowledging the role micro-credit can play in helping to reduce poverty, Hulme and Mosley (1996) concluded from their research on micro-credit that "most contemporary schemes are less effective than they might be" (1996, p.134). The authors argued that micro-credit is not a panacea for poverty-alleviation and that in some cases the poorest people have been made worse-off. It is argued that microfinance can facilitate the achievement of the Millennium Development Goals (MDGs) as well as National Policies that target poverty reduction, empowering women, assisting vulnerable groups, and improving standards of living. As pointed out by the former UN Secretary General Kofi Annan during the launch of the International Year of Micro Credit (2005), "Sustainable access to microfinance helps alleviate poverty by generating income, creating jobs, allowing children to go to school, enabling families to obtain health care, and

empowering people to make the choices that best serve their needs.”(Kofi Annan, December 2003).

Although microfinance is not a panacea for poverty reduction and its related development challenges, when properly harnessed it can make sustainable contributions through financial investment leading to the empowerment of people, which in turn promotes confidence and self-esteem, particularly for women.

2.5 Conventional Impact Assessments

The study examines some well-known conventional impact assessments to ascertain the extent to which implementation processes are incorporated in their work. It begins with an often cited study by Pitt and Khandker (1998) which examined the impacts of participation by gender in the Grameen Bank and two other group-based microcredit programmes in Bangladesh on labour supply, schooling, household expenditure and asset accumulation. A study by Johnson and Copestake (2002) is examined as a case of one of the few impact assessments studies that proves impact and demonstrates how and why these impacts occurred. This multi-component and multi-team research studied the operations of FINCA, an international microfinance NGO, in Malawi. The study assessed the economic, social and geographical impacts of the intervention; contextual influences; differences in impact between households; and impact improvement. The study compared three groups: continuing clients, departed clients and a control group. The significant findings of the study are presented below. Johnson and Copestake’s study is exhaustively reviewed not just as an example of a comprehensive impact assessment, but also for the wealth of information it reveals and its potential relevance to the thesis.

At the time of the baseline survey, 48% of service users were below the poverty line. This is typical of people that most microfinance reaches: people clustered around the poverty line (Hulme and Mosley, 1996). Household income of families with access to credit is significantly higher than for comparable households without access to credit (Remenyi, Joe and Quinones, Benjamin(2000). In Indonesia a 12.9 per cent annual average rise in income from borrowers was observed while only 3 per cent rise was reported from non borrowers (control group). Remenyi notes that, in Bangladesh, a 29.3 per cent annual average rise in income was recorded and 22 percent annual average rise in income from non borrowers. Sri-Lanka indicated a 15.6 rise in income from borrowers and 9 per cent rise from non borrowers. In the case of India, 46 per cent annual average rise in income was reported among borrowers with 24 per cent increase reported from non-borrowers. The effects were higher for those just below the poverty line while income improvement was lowest among the very poor. Lack of capital to start or run business led them to request for credits from micro-finance institutions (Ibru, 2009; Kuzilwa, 2005). This is due to poverty, unemployment, low household and business income and inability to save (May, 2009; Otero, 1999; Porter & Nagarajan, 2005; Roomi & Parrot, 2008). Women entrepreneurs, mostly in developing countries, lack the ability to save (Akanji, 2006; Mkpado & Arene, 2007), yet savings are needed to protect income, act as a security for loan and could be re-invested in the business (Akanji, 2006).

MFIs attempt to assess the impact of microfinance as measured by their impact on clients, their enterprises, household and the community in which they live. As a general rule, MFIs work toward a double bottom line – financial and social – unlike the typical financial institution which works solely toward a financial bottom – line.

Measuring financial returns is relatively straight-forward. Microfinance has borrowed liberally from the financial accounting and performance standards in the formal financial sector. Concepts such as return on equity, return on assets, portfolio at risk, and so forth are increasingly becoming the lingua franca of the microfinance industry. Measuring social return, however, is anything but straightforward. In practice, the specific impacts of microfinance are hard to pin down and harder still to measure. Impact assessments require adoption of research methodologies capable of isolating specific effects out of a complicated web of causal and mediating factors and high decibels of random environmental noise, as well as attaching specific units of measurement to tangible and intangible impacts that may or may not lend themselves to precise definition or measurement.

The difficulty and cost inherent in assessing social impact are such that most MFIs do not try to assess social impact; nonetheless, donors and policymakers have a legitimate interest in assessing the social returns to their social investments. Some knowledge of social impact is therefore necessary for MFI management and other stakeholders (e.g., donors and policymakers) to assess overall programme effectiveness. (Information on financial performance alone gives an incomplete picture of programme performance.)

Interest in the social impact of microfinance has led to a number of impact studies published in scholarly journals. Ten of these studies assess microfinance programmes in Bangladesh. McKernan (1996) finds that programme participation can exert a large positive impact on self-employment profits, while Pitt and Khandker (1998) find that programme credit has a significant impact on the well-being of poor households and

that this impact is greater when credit is targeted to women. Seven other studies in Bangladesh (Hashemi et al. (1996); Goetz and Gupta (1996); Schuler and Hashemi (1994); Hashemi and Riley (1996); Schuler et al. (1997); Steel et al. (2001) focus on the question female empowerment. All but one finds evidence that microfinance programme participation exerts a statistically significant impact on one or more aspect of female empowerment, such as contraceptive usage or intra-household decision-making. The sole Bangladesh study failing to find significant impact is Goetz and Gupta who find that significant portions of the women's loans were controlled by male relatives, thereby limiting the women's ability to develop meaningful control over their investment activities.

Dun (2001) finds that programme clients enterprises performed better than non-client enterprises in terms of profit, fixed assets, and employment. Finally, Anderson et al. (2002) analyze 147 MFIs and finds that microfinance participation increased environmental awareness and common pool resource stewardship.

Two published impact studies explicitly assessed community, or village-level, impacts. In Bangladesh, Khanker et al. (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. Woller and Parsons (2002) estimate that a microfinance programme in Portoviejo, Ecuador contributes \$480,000 per year in direct and induced economic benefits to the local economy. Other impact studies address trade-offs that need to be considered when performing microfinance impact assessments. Mosely and Hulme (1998) study 13 MFIs in seven countries (Bolivia, Indonesia, Bangladesh, Sri Lanka, Kenya, India,

and Malawi) and construct an “impact frontier” describing the inverse relationship they find between outreach (depth of poverty reached) and impact. Wydich (1999b) constructs a theoretical model to analyze the economic tradeoff between future returns to schooling and the current return to child labour in Guatemalan household enterprises. He finds that in some states, microcredit increases the probability that children will attend school; however, during certain states of moral hazard, the cost of schooling may outweigh the benefits of child labour. Kevane and Wydick (2001) find that targeting microenterprise credit to poor women appears to imply a trade-off between economic growth in favour of poverty reduction and child welfare. In particular, female entrepreneurs of child bearing age create significantly fewer jobs than male entrepreneurs. Each of the impact assessment studies cited above, with one noted exception, provide evidence of positive impacts of microfinance. Other impact assessment studies, however, fail to find significant impacts. In his assessment of Thai MFIs, Coleman (1999) finds that “naïve” estimates of impact failing to control for self-selection and endogenous (non-random) programme placement significantly overestimate programme impacts. He generalizes this finding to other impact assessments, arguing that most impact studies neglect the issues of self-selection and endogenous programme placement thus leading to systematic overstatement of impact.

Some researchers have questioned how far microfinance benefits women (Goetz and Sen Gupta, 1996). Some argue that micro-finance programmes divert the attention of women from other more effective strategies for empowerment (Ebdon, 1995), and the attention and the resources of donors from alternative, and possibly more effective means of alleviating poverty (Rogaly, 1996).

There is overwhelming evidence to demonstrate that families that participate in microfinance programs enjoy an increase in household income (Murdoch and Haley 2002). They also benefit from consumption smoothing and the ability to sustain gains over time (Khandker 1998:148; Murdoch and Haley 2002:5; Simanowitz and Walter 2002:23; Wright 2000).

Microfinance makes an impact on more than just household income. Case studies indicate that microfinance has substantial effect on the nutrition and health of the poor, especially for children (Wright, 2000). Integrated Microfinance Institutions are known for their direct involvement in nutrition and health through provision of education on AIDS Awareness and classes on nutrition and hygiene.

Indirectly, microfinance has a positive influence on nutrition and health because increased income through participation in microfinance programs invariably will lead to higher nutrition and greater access to health care (Simanowitz et al, 2002).

Graham Wright, in his book *Microfinance Systems: Designing Quality Financial Services for the Poor*, concludes that:

Nutritional indicators also seem to improve where Microfinance institutions have been working. Hashemi and Morshed cite a study conducted by the World Bank in collaboration with the Bangladesh Institute of Development Studies, which showed that the Grameen Bank not only reduced poverty and improved the welfare of participating households, but also enhanced the household's capacity to sustain their gains over time. This was accompanied by an increased caloric intake and better nutritional status of children in households of Grameen Bank participants|| (Hashemi et al, 2000).

Microfinance, by contributing to an increase in household income and better financial stability, enables poor families to bear the costs of sending children to school. MFIs are known for encouraging families to keep children in school and in some cases school attendance is mandatory in order to participate in the microfinance program (Murdoch et al, 2002). Studies show that when women are given greater autonomy over their lives and the lives of their children, living conditions invariably improve. This is mostly due to the fact that women are most apt to use household income to better the nutrition and educational opportunities of their children (Grasmuck and Espinal, 2000) .

A case study of Sinapi Aba Trust, a microfinance institution in Ghana, was conducted in order to determine whether microfinance has an impact on women's empowerment. The study shows that running a successful business does not only contribute to women's improved welfare, it also contributes both directly and indirectly to their empowerment. The increase in working capital is particularly important for women's empowerment. In almost all cases, the increase in capital has given women more options and greater control over their businesses and their lives (Cheston and Kuhn, 2002). Opportunity for entrepreneurial activity, in terms of new business or business expansion, acts as a link between micro-finance factors and women entrepreneurs' performance. It is reported that micro-finance factors create opportunity for entrepreneurs to generate income (Brana, 2008). The discovery of business opportunity and the decision to exploit the opportunity leads to a search for external funds, and the acquisition of such funds again creates opportunity for entrepreneurial income-generating activity (Shane, 2003). Proper application of the resources could lead to business performance (Koontz & Weihrich, 2006; Shane, 2003). Microfinance

clearly contributes to a greater economic stability and well-being of poor families through increase in income, health, nutrition, education, and empowerment, but can microfinance actually lift families out of poverty? The answer is yes. Microfinance is proven to improve the standard of living of many families to such a degree that they are completely lifted out of their impoverished situation.

2.6 Factors That Influence Access To Micro Credit

Available literature shows that access to micro credit is influenced by several factors. These include; income, education, size of business, type of business, membership of economic association, family size, etc. Ayamga *et al* (2006) observed that, family size positively influence the decision to participate in micro credit schemes. women in groups are likely to have access to micro credit than those who do not belong to any group Armendariz and Morduch (2005) and Kah *et al* (2005) . It has been observed in empirical literature that households and individuals with low income especially in developing countries have difficulty accessing credit Benito and Mumtaz, (2006); Del-Rio and Young, (2005); Crook and Hochguertel, (2005); Thaicharoen *et al*,(2004); Magri, (2002); Crook, (2001); and Arvai and Toth,(2001).

Akram *et al* (2008); Benito and Mumtaz (2006); Thaicharoen *et al* (2004); and Crook (2001) hold the view that age is a significant micro credit constraint. Also, Ayamga *et al* (2006); Thaicharoen *et al* (2004); and Arvai and Toth (2001) in separate studies observed that, formal education significantly influence participation in micro credit schemes. The perception of income class has positive relationship with probability of access to micro credit. Benito and Mumtaz (2006); Del-Rio and Young (2005); and Magri (2002), all cl that income levels influence individuals' and households' decisions to source micro credit either for investment or consumption purpose

CHAPTER THREE

STUDY AREA AND RESEARCH METHODOLOGY

3.0 Introduction

This chapter presents the characteristics of the study area and explains the study methodology as well as the theoretical and analytical framework. In addition, it presents sampling procedure and data collection techniques, finally it defines variables used in the analysis. Successful outcome of the report of any scientific study largely depends on, and is a direct function of, the quality and accuracy of data collected and used during the research. In fact it embraces the entire research up to the analysis and deduced conclusions. This section discusses the approach adopted for data collection and analysis (the case study method), data classification and sources and the major instruments of data collection.

3.1 Study Area

The study covered two districts namely, Agona East district and Agona West municipality. These two districts are located in the central region of Ghana. The central region has a population of 1,593,823 with a population growth rate of 2.1%.

3.1.1 Profile Of Agona East District

Agona East district with its capital **Nsaba** forms part of the new districts and municipalities created by President, J.A Kufuor. The district is made up of two (2) Paramount Areas- Agona Nyakrom traditional Area and Agona Nsaba Traditional Area. The Agona East District's Estimated Population now stands at 85,339 with female slightly dominating at an estimated population of 43,864.

While the male population was estimated at 41,475 (source: 2009 AEDA DWSP Data Collection Report).

The Agona East District has a lot of economic potentials. Though variety of crops and other commercial activities abound in the district, its market infrastructure has not been developed and for this reason, the district cannot boast itself of any remarkable trade and commerce. These activities are rather carried out in the adjoining district, specifically in Agona Swedru town. The district produces large quantities of cassava, maize, plantain, cocoyam and vegetables. Cocoa, palm oil and coffee are also produced. Granite for the production of quarry stone for all types of construction abound.

Three communities (including the district capital) are served by Post Offices whilst four other small towns have postal agencies. The main function of these facilities is delivery of letters. Their operations are currently challenged as the result of internet facilities and text messages being offered by cell phones. Almost all the major Towns in Agona East district are now hooked on to the cellular networks such as Vodafone, MTN, Tigo, Zain and Kasapa. The Nyarkrom and Agona Rural Banks have their branch banks in the district. The existence of such banking institutions in the district facilitates mobilization of rural capital for development.

3.1.2 Profile Of Agona West Municipality

Location & size:

The Agona West Municipal can be found in the eastern portion of the Central Region. It has a total land area of 540-sq. km. and a population of 160,000. The municipality is divided into eleven zones. The area is bounded to the East and West by /Effutu

Municipal and Asikum/Odoben/Brakwa Districts respectively. The municipality shares a border to the northeast with Akim West Municipal, to the northwest with Brim-South District and to the South, with Gomoa District.

Agona Swedru is the capital and has a population of about 40,000. It lies to the north of Winneba and is about 40 kilometers off the main Accra-Takoradi highway. The location of the township makes it the commercial center of the region and a modal point from which roads radiate to the rich cocoa growing countryside of the Region. The municipality has a total land area of 667 square kilometers

There is an extensive tarred road network linking all the zonal centres in the district. A greater part, of which is in good state.

Major sources of energy for both domestic and industrial purposes are fuelwood, charcoal, kerosene and electricity. There is however a heavy dependence on traditional energy sources for cooking/ heating and kerosene for lighting. Seven out of eleven zonal centres are connected to the national electricity grid. However, power supply to the outlying settlements is insignificant and out of a total of 862 settlements only fifteen (15) have electricity supply. The contribution of the private sector to road transport and communication cannot be over emphasized. The large volume of trade and other economic activities in the district have been made possible through the enormous contribution of the private sector. Most of the zonal centers can boast of only postal services and the much-needed extension of telephone facilities from the district capital to these areas has been hampered by lack of funding.

A number of banking institutions operate in the municipality. Notable among these are the Ghana Commercial Bank, Agriculture Development Bank, International

Commercial Bank, Barclays and a number of Rural/Community Banks. The Agona West district has a large pool of unemployed labour. The most dominant market centers of the district are Swedru and Nsuansa markets. These alone account for about 70% of the volume of trade in the district. Swedru in particular happens to be the commercial centre of the entire region. However, the general marketing infrastructure to support the enormous wholesale and retail trading activities are extremely inadequate.

Population

The Agona District has a total population of 158,678 with female slightly dominating at an estimated population of 83,504 while male population was estimated at 75,174 according to the 2000 Population and Housing Census. The population growth rate was 2.66% in 1984. About 40% of the total population are children (source: Ghana - We Mean Business: A Guide To Ghana's 110 Districts page 282). In 1960 the population of the area forming the current Agona District was 82,607 and growing at an annual rate of 0.6% it reached 87,446 in 1970 and by 1984 the total population was 122,631 showing an annual growth rate of 2.66% between 1970 and 1984 (source: 1996-2000 Medium Term Development Plan page 14). With the current (2000) population being 158,678, the annual growth rate between 1984 and 2000 is 1.196% per annum. However, the growth rate of the major towns shows a higher average growth rate of 2.4%. The trend is the same nation wide. There is a trend of increasing urbanization. The population is predominantly female (52%), with males forming about 48%. It has a working population of about 48% who take care of the aged

(6.7%) and the youth (45%). This gives a dependency ratio of 1.08. This means that every working adult cares for two persons.

3.2 Sample Selection and Data Collection Procedure

The population for our study encompasses the people who have been engaged in microfinance activities for at least two years and live in the study area. The researcher chose the people with a long experience in microfinance activities because they are well informed and know much about the pros and cons about its activities, so they can reflect better to our questionnaire. A structured questionnaire for collecting the data by interviewing the clients attached to the MFIs was used. The people for the interview were selected randomly. To get the address and particulars of the interviewees in different areas, assistance was sought from the local branches of MFIs and from the local people of the area. A multi-stage random sampling methodology was used to arrive at a total sample of 200, people. The beneficiaries of microfinance were 100, and non-beneficiaries were 100.

3.3 METHODOLOGY

There are mainly two kinds of research methods, quantitative method and qualitative method. These two methods differ in terms of the numeric (numbers) or non-numeric (words) data. Quantitative method is predominantly used as a synonym for any data collection technique (such as a questionnaire) or data analysis procedure, such as: graphs or statistics that generates or uses numerical data. On the other hand, qualitative method is predominantly used as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorizing data) that generates or uses non-numerical data. It is not easy to express the impact of micro finance on the general people of a country with the help of few sentences. On one

hand, some impacts can be shown only in numerical figures like, savings and income, while on the other hand other impacts can be expressed only in descriptive ways, like, access to education, business experience etc. Thus, the result of this study depends on numerical and non-numerical analysis, using both quantitative and qualitative methods.

Access to finance is important in improving business performance in terms of profit for small scale business operators. However most of these people are poor thus they need credit to achieve this goal. Due to their poverty level and inability to support their application with collateral most of the Universal Banks do not offer them credit. This segment of the market is what microfinance institution aimed at. However asymmetric information, adverse selection and contract enforcement problems that characterize credit markets in developing countries usually prevail giving rise to credit rationing as an optimal behaviour limiting expected gains in credit (Stiglitz and Weiss, 1981; Ghosh, Moorkerjee and Ray, 1999).

In this study the researcher adopted and modified a method used by Becerril and Abdulai (2010) to evaluate the impact of micro credit on productivity indicators. Generally, in order to evaluate the impact of an intervention such as micro credit on performance indicators it is necessary to draw a counterfactual scenario about the performance indicators of the participants (treated).

The counterfactual performance indicators of the treated in absence of the treatment (access to micro credit). The counterfactual would then be compared with the performance level during programme participation (access to micro credit) in order to

evaluate the impact of the treatment (access to micro credit) on the performance indicators.

For the treated their counterfactual would be the performance level in the absence of micro credit. While for the untreated their counterfactual would be the level of outcome variables when they access micro credit.

However, the challenge here is that it is difficult to assess counterfactuals, thus some studies used the performance level of the control groups as counterfactual. This has been proved to result in bias estimates of the effect of participation or the intervention. The section below explains how the use of performance level of the control group can lead to a bias estimate of the programme effect.

Assume that the impact of access to micro credit on performance indicators is

$$\delta = Y_1 - Y_0 \quad 3.1$$

Where Y_1 and Y_0 denotes performance levels of the respondents when they participated in micro credit and the counterfactual respectively. The Average Treatment Effect (ATE) of access to micro credit can be estimated as:

$$ATE = E(\delta) = (Y_1 - Y_0) \quad 3.2$$

Where $E(.)$ represents the average or expected performance level. Since there are two groups of respondents (treated and control) we can evaluate the effect of micro credit on each group. The impact of treatment on the performance of the respondents who participated in the micro credit (treated) can be estimated as:

$$ATT = E(Y_1|D = 1) - E(Y_0|D = 1) \quad 3.3$$

Where ATT represent Average Treatment effect on the Treated and D denotes access to micro credit indicator which equal to one (1) if the respondent access or use micro credit and zero (0) otherwise. $E(Y_0|D = 1)$ is the mean performance level of treated in absence of the treatment that is counterfactual productivity level. In the case of non-participants (untreated or control), group of respondents can be estimated as:

$$ATU = E(Y_1 - Y_0|D = 0) \quad 3.4$$

Where, ATU is the Average Treatment effect on the Untreated. The estimation of ATT and ATU clearly depends on the counterfactual productivity levels of the two groups treated and control

{ $E(Y_0|D = 1)$ and $(Y_0|D = 0)$ } respectively .

In non-experimental study such as ours it is impossible to assess or measure the counterfactual performance levels of the two groups. It is possible to use the performance level of non-participants as a counterfactual for participants or the treated; however this may lead to bias ATT due to selection bias. For example let us represent the change in performance level of the treated and the control as:

$$\Delta = E(Y_1|D = 1) - E(Y_0|D = 0) \quad 3.5$$

Through expansion and rearrangement we have :

$$\Delta = E(Y_1|D = 1) - E(Y_0|D = 1) + E(Y_0|D = 1) - E(Y_0|D = 0)$$

$$\Delta = ATT + E(Y_0|D = 1) - E(Y_0|D = 0)$$

$$\Delta = ATT + SB$$

$$ATT = \Delta - SB \tag{3.6}$$

Where SB is selection bias which arises as a result of selection of respondents into treatment (access to micro credit) and control groups respectively with pre-treatment characteristics which influence outcome variables (performance indicators in this case). If $SB = 0$, then the difference between the average observed performance indicators of treated and control groups of respondents would be given as:

$$\overline{ATT} = E(Y|D = 1) - E(Y|D = 0) \tag{3.7}$$

However, if SB is not equal to zero then there exist selection bias thus the estimated ATT would not be the difference in the average observed performance of the participants in micro-credit (treated) and untreated (non-participants).

It is possible that financial institutions offer micro credit to hard working small scale business operators through their screening and selection process as they want to offer service to individuals and groups that are in position to repay the loan and interest $SB \neq 0$. Hence respondents who participated in micro credit programme may have a higher performance levels even in the absence of their participation in the micro credit programme compared to performance level of non-participants, leading to selection bias.

Therefore the performance level of the untreated group is not a good comparison for the counterfactuals of the treated group in estimating the Average Treatment effect on

the Treated (ATT). Thus to eliminate selection bias and estimate unbiased ATT there is the need to compare the productivity levels of treated and untreated groups which are statistically identical (Rosenbaum and Rubin, 1983; Khandker et al (2010). Rosenbaum and Rubin (1983) suggested the use of Propensity Score Matching approach to deal with selection bias and estimate unbiased estimates of ATT. The Propensity Score Matching (PSM) approach is based on the idea that by matching the outcome (performance levels) of treated and control respondents who are similar in observable characteristics, selection bias would be eliminated.

The propensity score matching is used to correct for the estimation of effects of the programme controlling for the existence of these confounding factors based on the idea that the bias is reduced when the comparison is performed using participants and control respondents who are as similar as possible.

The PSM approach follow two steps, first binary model is used to estimate the probability of access to micro credit or participation in micro credit programme (propensity score) on observable characteristics. Propensity score is a conditional probability estimator, and any discrete choice model such as logit or probit can be used as they yield similar results (Caliendo and Kopeinig, (2008). In this study logit model is used, which is specified as:

$$P(X) = P(D = 1|X) = F(\beta_1 X_1 + \dots \beta_i X_i) = F(X\beta) = e^{X\beta} \quad 3.8$$

Where F (.) denote response probability which strictly ranges between zero and one and X represent all observable characteristics (Covariates) which influence micro credit participation, β is the parameter of interest to be estimated. In general, the

difference in potential outcomes can be captured in the Treatment Effect (TE) for an individual i , expressed as follows:

$$TE = Y_{i1} - Y_{i0} \quad 3.9$$

Where $i = 1, 2, \dots, N$ and N represents the total population. Obviously, the individual treatment effect cannot be calculated, because it may not be possible to observe both outcomes for the same agent at the same time. Hence, treatment effects over the average population with counterfactuals for unobserved outcomes need to be derived (Heckman, et al., 1999). One parameter of interest here is the average treatment effect on the treated (ATT). By assuming that all information relevant to micro credit access and business performance are observable, the true ATT based on PSM, can be written as:

$$ATT_{PSM} = E_{P(X)} \{ (E(Y_1|D=1, P(X)) - E(Y_0|D=1, P(X))) \} \quad 3.10$$

Where $E_{P(X)}$ denote the expectation with respect to the distribution of propensity score in the entire population and $E(Y_1|D=1, P(X))$, $E(Y_0|D=1)$ are as defined above.

Where Y_1 and Y_0 denote performance levels of the respondents when they participated in the micro credit and the counterfactual (when they did not participated in micro credit) respectively. The impact of treatment on the performance indicators of the respondents who participated in micro credit (treated) can be estimated as:

$$ATT = E(Y_1|D=1) - E(Y_0|D=1)$$

3.11

Where ATT represent Average Treatment effect on the Treated and D denotes microfinance market participation (access to micro credit) indicator which equal to one (1) if the respondent participated in micro credit and zero (0) otherwise. $E(Y_0|D = 1)$ is the mean of the performance indicators of treated in absence of the treatment ie counterfactual performance level. In the case of non-participants (untreated or control) group of respondents their mean performance indicator can be estimated as:

$$ATU = E(Y_1 - Y_0|D = 0)$$

3.12

Where, ATU is the Average Treatment effect on the Untreated. The estimation of ATT and ATU clearly depends on the counterfactual productivity levels of the two groups treated and control

$\{ E(Y_0|D = 1) \text{ and } (Y_0|D = 0) \}$ respectively . The true ATT indicates the mean difference in maximum performance level achieved between participants and non-participants that are identical in observable characteristics and adequately weighted by a balanced probability of participation. In the estimation of ATT , I have adopted three different matching algorithms which involve trade-offs in terms of bias and efficiency to match treated and untreated respondents. These are:

Nearest Neighbour Matching (NNM), this method selects the control group with the smallest distance in propensity score to the treated group (respondents who access micro credit). Generally, this is done with replacement and it works well once the distribution of the propensity score of both groups (control and treated) are similar.

We use matching with replacement following routines similar to the one employed by Backer and Ichino, (2002). Nearest neighbour match is computed as follows

$$C_i = \min_j \|P_i - P_j\|$$

3.13

Where C_i is asset of control units matched to the treated unit (i), with estimated value of the propensity score p_i

Radius Matching (RM) or Calliper involves all neighbours with a maximum propensity score distance. This is normally defined a priori and it corresponds to common support assumption. Radius matching also helps to avoid poor matches which may arise through matching too distant neighbours (Smith and Todd, 2005).

Radius matching is where an individual from the control group is chosen as a matching partner for a participant that lies within the specified radius in terms of propensity score. Radius matching can be expressed as

$$C_i = \{P_j \|P_i - P_j\| < r\}$$

3.14

That is to say, all propensity scores for controls (p_j) falling within a radius (r) from p_i (propensity score of participant, i) are matched to that participant (i).

Kernel-Based Matching (KM) was recommended by Heckman et al (1997). This is non-parametric estimator that include all respondents of the underlying sample of control group and weight more distant observed characteristics among both group (control and treated) down. Hence it indicate lower variance, nevertheless Caliendo and Kopenig (2008) noted that poorer matches could be obtained. The Kernel –based estimator of the ATT describes the mean difference in outcome while the matched

outcome is given by Kernel-weighted average of the outcome of control group of respondents. In the case of Kernel Matching (KM), each participant is matched with a weighted average of all controls with weights that are inversely proportional to the distance between the propensity scores of participants and controls. The formulation is given as

$$ATI^k = \frac{1}{N^T} \sum_{i \in T} \left\{ Y_i^T - \frac{\sum_{j \in C} Y_j^C G\left(\frac{P_j - P_i}{h_n}\right)}{\sum_{k \in C} G\left(\frac{P_k - P_i}{h_n}\right)} \right\}$$

3.15

Where $G(\cdot)$ is a kernel function and h_n is a bandwidth parameter (default is 0.06). Under standard conditions on the bandwidth and kernel, the following expression is a consistent estimator of the counterfactual outcome Y_{i0} . PSM approach can be implemented under two critical assumptions. These assumptions are Conditional Independence Assumption (CIA) and Common Support Assumption (CSA). Conditional independence Assumption (CIA) states that a set of observable covariates X which are not affected by treatment (micro credit participation) potential outcome, in this case performance level of the treated, are independent of treatment assignment. This implies that all variables that influence micro credit market participation and potential productivity are observed.

In this case the productivity of participants (treated) Y_1 and non-participants (control group) Y_0 are assumed to be independent of the treatment, conditional on observable characteristics or covariates (X). Thus respondents' participation and non-participation decision is exclusively based on observable covariates X . The common Support Assumption (CSA) rule out the phenomenon of perfect predictability of

participation in micro credit or access to micro credit ($D=1$) given covariates X . This ensures that respondents with identical observable characteristics or covariates (X) have a positive probability of belonging to a particular group-participants or non participants groups (Heckman *et al*, 1999). This can be presented mathematically as:

$$0 < P(D = 1|X) < 1$$

3.16

These two assumptions ensure that probability of belonging to treatment group (participating in micro credit) is strongly ignorable.

I evaluated the quality of the matches used to estimate ATT by using approach recommended by Sianesi (2004) has also recommended an additional assessment of the matching quality which. I also undertook the re-estimation of the propensity score of matched participant respondents and matched non-participants respondents. Good quality matches are those whose covariates are conditioned after the estimation of the propensity score and which are able to balance the distribution of the relevant outcome variables in the treated and controlled respondents (Rosenbaum and Rubin, 1985). The matching procedure is said to balance the covariates very well if the pseudo- R^2 after matching is fairly low, and the probability of the F -statistics is not significantly different from zero.

3.4 Choice of variables and expected effects

The variable selection was based more on literature and related studies by other researchers such as Nathan *et al* (2004); Ayamga *et al* (2006); and Rahji and Fakayode, 2009). The age of respondent (X_1) was included in the model because it is

used as a proxy for maturity and the potential ability to utilize and repay credit by borrower (Rahji and Fakayode, 2009). It was expected to be positively related to access to micro credit. It was measured in years. As respondent grow beyond their economically active age (X_2), their access becomes less because their economic activity which is directly proportional to amount of credit one can access becomes low. It was expected to have either positive or negative influence on access to micro credit and was measured in years. The higher the level of knowledge of the respondent (X_3) of the different sources of micro credit available to them, the more easily they would have access. This was expected to positively influence access to credit by the respondents because the more the knowledge on different sources, the more the person can borrow from such different sources. It was measured as a dummy. The perception of the respondents' on income class (X_4) was expected to be negatively related to the access to micro credit. This is because the higher their perception that borrowing from these institutions is the preserve of high income class, the lower their access to micro credit will be. It was measured as a dummy. Also, the perception of the respondents that they are able to access credit from these financial institutions irrespective of being a woman or a male (X_5) was expected to be positive. It was measured as a dummy. The perception of respondents on formal schooling (X_6) was expected to have a positive effect on their access to micro credit from these institutions implying that they perceive formal schooling as a barrier to their access to micro credit. This is because education is said to be a major factor that influences the decision to participate in and access credit (Ayamga *et al*, 2006; Lukytawati, 2009). It was measured as a dummy Membership to solidarity groups or associations (X_7) is a fundamental requirement for accessing micro credit by small borrowers (Lukytawati,

2009). Group based lending is a way of circumventing adverse selection and moral hazard issues (Armendariz and Morduch, 2005) and was expected to have a positive effect on access to micro credit. This is because most of these institutions rely on social collateral provided by poor borrowers for the advancement of credit. This implies that once a person belongs to an economic solidarity group, such a person is not required to provide collateral to be able to access credit. Members of the group jointly guarantee for each other. It was measured as a dummy. Savings (X_8) was chosen because it serves as a proxy for the measurement of net worth of the respondent. The more savings made by the respondents, the more the likelihood he or she is able to repay and therefore can take a higher amount. It was measured as a dummy. The higher the perception of respondents that interest rate is high (X_9), the lower their access to micro credit. This was supposed to have a negative effect on the extent of access because the higher the perception of a person that interest rate is high, the lower the probability that such a person will borrow. It was measured as a dummy. Distance (X_{10}) was expected to have a negative effect on extent of access implying that those who are far away from these financial institutions will have lesser access than those close by. It was measured in kilometres. The perception of the application procedures (X_{11}) was expected to have a negative effect on access because once a person perceives the application procedures as cumbersome; he or she will put less effort to acquire credit from the rural banks. It was measured as a dummy. The size of the business (X_{12}) was also included because it can be used to estimate the potential income of the borrower and was expected to have a positive influence on the access to credit. It was measured as value of total asset in Ghana Cedis

3.4 Determining factors influencing respondent decision to participate in micro credit

facilities

The logit model was used to identify the factors that influence respondents' access to micro credit in the study area.

The empirical model is specified as:

$$\log\left(\frac{p}{1-p}\right) = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + \alpha_6 X_6 + \alpha_7 X_7 + \alpha_8 X_8 + \alpha_9 X_9 + \alpha_{10} X_{10} + \alpha_{11} X_{11} + \alpha_{12} X_{12} + \varepsilon$$

3.17

Where:

$\log\left(\frac{p}{1-p}\right)$ = The log-odds in favour of having access to micro credit

X_1 = Age in years

X_2 = Age squared

X_3 = Knowledge of credit sources, dummy (1 = Has knowledge; 0 = Otherwise)

X_4 = Perception of income of the respondents dummy (1 = High income; 0 = Otherwise)

X_5 = Perception of gender, dummy (1 = Women; 0 = Otherwise)

X_6 = Perception of formal schooling, dummy (1 = Literate; 0 = Otherwise)

X_7 = Association membership, dummy (1 = Member of association; 0 = Otherwise)

X_8 = Savings made, dummy (1 = Has savings with financial institution; 0 = Otherwise)

X_9 = Perception of interest rate; dummy (1 = Interest rate is high; 0 = Otherwise)

X_{10} = Distance to financial institution in kilometres

X_{11} = Perception of application procedures, dummy (1 = Cumbersome; 0 = Otherwise)

X_{12} = Value of total asset in Ghana Cedis

$\alpha_0, \alpha_1, \dots, \alpha_{12}$ are coefficients to be estimated and ε is the error term which captures discrepancies due to human measurement and natural factors.

3.4 Goodness of fit test and hypotheses testing for the binary models

The likelihood ratio index (ρ^2) according to Cameron and Trivedi (2005) is used for the purpose of validating the explanatory power of the binary choice models and is specified as:

$$\rho^2 = 1 - \frac{L(\beta_u)}{L(\beta_r)}$$

3.18

The likelihood ratio index which is similar to the F – Statistic in least squares multiple regression is also used for testing the hypothesis on the slope coefficients. It lies between zero and one. The hypothesis that all the slope coefficients are zero was tested using the likelihood ratio (LR) statistic (χ^2) which is given as:

This is analogous with the Chi-square (χ^2) with the degrees of freedom being the sum of all the estimated parameters of the model. The decision criterion is that if the tabulated Chi – square value is greater than the calculated Chi – square value, then the alternative hypothesis that the entire slope coefficients are not zero is rejected in favour of the null hypothesis, they are zero. The t – test was used to test the significance of the individual variables included in the model.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents the results of the study and gives a detailed discussion of the results. First, the background information of respondents is presented. Second, the level of access to micro credit from the financial institutions by the women is presented. Third, the factors that influence the extent of access to micro credit from the financial institutions by the respondents are presented. Lastly, the impact of micro credit on the performance of the respondents is discussed. The income earnings of beneficiary women are compared with that of the non-beneficiary women and tested statistically using the t-test to determine whether or not there are any significant differences between them.

4.1 The Background Information of the Respondents

The study results showed that the women who were included in the study have varied backgrounds. They are heterogeneous in their social and economic pursuits. Table 4.1 gives the background information of the respondents which comprises of the age, the level of education, marital status, membership to economic or solidarity groups/associations, the savings behavior of users, type of enterprises or business and family sizes. See Table 4.1 for the statistical analyses of background information of the respondents.

The study showed that there is no significant difference between the beneficiary and non-beneficiary women in terms of their ages. Whereas the mean age of the beneficiary women was found to be 41.0 years, that of the non-beneficiary women

was found to be 40.8 years the difference between which proved to be statistical insignificant. With regards to family and business sizes in terms of assets, there are significant differences between beneficiary and non-beneficiary women. Whereas beneficiaries fend for an average family size of 5.9 people, the non-beneficiaries fend for an

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Table 4.1: Background information of the respondents

Variable	Beneficiary	Non-beneficiary
Age (years):		
Minimum	28	25
Maximum	62	65
Mean	41.0	40.8
Standard deviation	9.9	9.3
Test of means using t –test	No significant difference between the mean ages	
Family size:		
Minimum	2	2
Maximum	12	10
Mean	5.9	4.9
Standard deviation	2.3	2.7
Test of mean family sizes using t- test	The difference between the mean family sizes is significant at 1%	
Farm size (Hectares):		
Minimum	GHC 3,000	GHC 1,400
Maximum	GHC 800	GHC 300
Mean	GHC 1,600	GHC 500
Standard deviation	0.7	0.3
Test of means using t –test	The difference between the mean business sizes is significant at 5%	
Marital status (%):		
Married	95	80
Single	5	20
Test of means using t –test	The difference between the mean farm sizes is significant at 10%	
Savings behaviour/habit:		
Yes	100	23
No	0	77
Association membership:		
Yes	100	17
No	0	83
Type of business		
Petty trading	100	72
Food processing	0	28
Education:		
No education	63	87
Non-formal	25	11
Formal education	12	2

Source: Survey data, 2010

Average family size of 4.9 people. The finding that beneficiaries have larger family sizes is consistent with the findings of Ayamga *et al* (2006) that family size positively

influence the decision to participate in micromicro credit schemes. Also, beneficiary women have an average business size of GHC of 1,600 and that of non-beneficiaries is GHC 500.00.

The study results further revealed that the savings behaviour, membership to economic associations and the business type differ between beneficiary and non-beneficiary respondents. Whereas all (100%) of the beneficiary women have savings with the financial institutions only 23 percent of the non-beneficiary women had just started making some savings with the financial institutions during the third quarter of 2010. This has serious implications on the ability of non-beneficiary women to access micro credit since the policy of these financial institutions is savings before micro credit. Besides, while all (100%) of the beneficiary women belong to economic associations, only 17 percent of the non-beneficiary women belong to such groups. This has serious implications for the non-beneficiaries getting access to micro credit from these financial institutions because lending to women by these financial institutions is basically by groups. Also, the study results showed that all (100%) of the beneficiary women are into petty trading only 28 percent of their non-beneficiary counterparts are into petty trading. In addition, while 37 percent of beneficiary women had formal education, only 13 percent of non-beneficiary women had formal education. This is a challenge to the non-beneficiary women's access to micro credit from these financial institutions because level of formal education is said to be positively correlated to access to micro credit (Ayamga *et al*, 2006; Thaicharoen *et al*, 2004).

4.2 Credit package offered to the respondents

The study showed that these financial institutions offer an intervention package to the beneficiaries; this consists of a number of components. These components include group formations, training, savings micro credit and supervision of economic activities. Some of these components however, overlap and are interdependent. Table 4.2 presents detailed descriptions of the components of the package offered to the respondents by rural the financial institutions.

Table 4.2: Components of package offered by the financial institutions to the respondents

Component Offered as at December, 2008	Description of component	Problems in offering component
Training	Groups are given training in groups dynamics, operations of the financial institutions' services rendered, who can access services especially micro credit, micro credit management and utilization	Inadequate qualified staff to handle training especially in group dynamics. Training in most cases is only once and this is not enough.
Savings	Groups are given the opportunity to save with these institutions for a minimum of period of 3 months. This is used to determine the regularity of flow of income and commitment of group members.	Groups sometimes prefer keeping their monies at home to saving in the bank. Some group members often complain of low interest paid on their savings.
Micro credit	Micro credit comprising of the principal amount, interest to be paid which is between 22% and 27% and processing or commitment fee of 3% of principal	Late micro credit applications and diversion of micro credit funds to unintended uses is a major problem.

Source: Field Survey Data, 2010

From the results in Table 4.2 on the components of financial capital offered by the financial institutions to the respondents, it is clear that each of the components is crucial for their business development.

4.3 Extent of Access to micro credit by the Women

In assessing the level of access to micro credit by the women, the study first looked at the trend of micro credit applications to these financial institutions by the respondents' groups from 2007 to 2009. The results showed that the number of groups in the study area that applied for micro credit from these financial institutions reduced from 278 in 2007 to 213 in 2009 representing about 23 percent reduction. Similarly, those groups which were offered micro credit by these financial institutions also decreased correspondingly from 261 in 2007 to 206 in 2009 representing about 21 percent decrease. Out of the successful applicants, those who were not offered the total amounts they applied for decreased from 187 in 2007 to 161 in 2009 representing about 14 percent reduction. The reducing trend of group applicants has a serious consequence on the extent of access to micro credit by the women since these institutions prefer group based lending. Table 4.3 presents the nature of group micro credit applications and the offerings by the financial institutions.

Table 4.3: Nature of group micro credit applications and offerings by financial institutions in the study area

Year	Number of groups who applied for micro credit	Number of groups given total amount of micro credit applied for		Number of groups given a portion of the amount applied for		Number of groups not given micro credit at all	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
2007	278	74	27	187	67	17	6
2008	234	53	23	171	73	10	4
2009	213	39	18	167	78	7	3
Total	725	166	23	525	72	34	5
Percentage Success = $\frac{(166 + 525)}{725} \times 100\% = 95\%$						Percentage Failure = $\frac{34}{725} \times 100\% = 5\%$	

Source: Field Survey Data, 2010

However, for the entire period (2007-2009), six hundred and ninety-one (691) groups out of the seven hundred and twenty-five (725) representing 95 percent were offered micro credit by these financial institutions thereby given the success rate to be 95 percent. Given the 95 percent success, 23 percent of them were granted the amounts applied for. Also, 72 percent of the applicants were given a proportion of the amount they applied for. Given that about 95 percent of the groups for the three year period have been successful in their micro credit applications, it can be concluded that women in groups are more likely to be successful in their applications for micro credit from these financial institutions than their counterparts who are not in groups. This conclusion is consistent with that of Armendariz and Morduch (2005) and Kah *et al* (2005) who observed that women in groups are less likely to be micro credit constraint. Over the same period (2007-2009), the total micro credit applied for by the groups amounted to two million, nine hundred and twenty-eight Ghana Cedis (GH¢2, 000, 928). For the purpose of this study, the specific names of the financial

institutions will not be mentioned but the categories of the financial institutions would be mentioned Table 4.4 presents the amounts of micro credit applied for by women and the amounts granted to them by the financial institutions during the period.

Table 4.4: Level of micro credit supplied to women groups by financial institutions in the study area

Institutions	Applied/Received/Extent	2005	2006	2007	2005 - 2007
Financial NGOs	Amount applied for (GH¢)	77, 791	97, 945	160, 780	336, 516
	Amount received (GH¢)	52, 238	66, 603	110, 456	229, 297
	Extent of access	0.6715	0.6800	0.6870	0.6814
	Percentage increase (%)	-	22	40	-
Savings and loans companies	Amount applied for (GH¢)	107, 087	163, 065	267, 753	537, 905
	Amount received (GH¢)	82, 037	103, 321	158, 013	343, 371
	Extent of access	0.7661	0.6336	0.5901	0.6383
	Percentage increase (%)	-	21	35	-
Rural banks	Amount applied for (GH¢)	145, 621	235, 864	387, 289	768, 774
	Amount received (GH¢)	94, 265	137, 571	275, 044	506, 880
	Rate of access	0.6473	0.5833	0.7102	0.6593
	Percentage increase (%)	-	31	50	-
Credit Unions	Amount applied for (GH¢)	85, 739	102, 950	169, 044	357, 733
	Amount received (GH¢)	54, 294	86, 589	97, 571	238, 454
	Extent of access	0.6332	0.8411	0.5772	0.6666
	Percentage increase (%)	-	37	11	-
Total	Amount applied for (GH¢)	416, 238	599, 824	984, 866	2, 000, 928
	Amount received (GH¢)	282, 834	394, 084	641, 084	1, 318, 002
	Extent of access	0.6795	0.6570	0.6509	0.6587
	Percentage increase (%)	-	28	39	-

Source: Field Survey Data, 2010

Table 4.3 shows that within the period (2007-2009), the successful groups are able to access about 66 percent of what they apply for from these financial institutions This in simple terms implies that if a applied for GH¢100.00 for instance, it was given about GH¢66.00.

It was also found that the respondents in 2009 made some savings with the financial institutions in the study area. Out of the two hundred (200) women interviewed, 123 of them representing about 62 percent, had savings with the financial institutions. In 2009, they made a total savings of GH¢1, 166.00 with the four categories of financial institutions giving an average savings of GH¢9.48 per respondent. Though with the highest number of respondents who made savings during the period, the least average amount savings of GH¢6.24 per woman was made in Savings and Loans Companies and the highest average amount of GH¢12.90 was made in a Micro credit Union.

Table 4.5: Savings made in the financial institutions by respondents in 2009

Institutions	Number of respondents who saved	Frequency of savings	Amount of savings made by respondents (GH¢)	Average savings per respondent (GH¢)
Financial NGOs	30	Weekly/Monthly	247	8.23
Savings and Loans Company	33	Weekly/Monthly	206	6.24
Rural Banks	31	Weekly/Monthly	339	10.94
Credit Unions	29	Weekly/Monthly	374	12.90
Total	123		1, 166	9.48

Source: Field Survey Data/ Passbooks, 2010

The amount saved per person per week ranges from 20Gp to 50Gp. The average savings made by each respondent for all the categories of financial institutions in 2010 was found to be about GH¢9.48. Given that the amount of savings made to a

large extent influence how much micro credit is been received, it can be said that the intensity of access to micro credit from the financial institutions can only improve if the average savings by individual women are improved.

Of the respondents interviewed, incidentally, those who had made savings in these financial institutions were those who applied for micro credit. This emphasizes the savings before micro credit policy of the financial institutions. All the one hundred and twenty-three (123) respondents who had savings with the financial institutions applied for micro credit and the remaining seventy-seven (77) respondents never attempted to apply for micro credit (see Table 4.6).

Table 4.6: Nature of micro credit applications by respondents and offerings by the financial institutions

Institutions	Number of respondents who did not apply for micro credit	Number of respondents who applied for micro credit	Number of respondents granted total amount applied for	Number of respondents granted portion of amount applied for	Number of respondents not given micro credit
Financial NGOs	20	30	7	18	5
Savings and Loans Company	17	33	9	16	8
Rural banks	19	31	11	14	6
Credit Unions	31	29	14	11	4
Total	77	123	41	59	23
Percentage Success and Failure			$\text{Success} = \frac{(41 + 59)}{123} \times 100\%$ $= 81\%$		$\text{Failure} = \frac{23}{123} \times 100\%$ $= 19\%$

Source: Survey data, 2010

As shown in Table 4.6, the study revealed that out of the 123 respondents who applied for micro credit from the financial institutions 100 of them representing 81 percent were successful in their applications and 23 of them representing 19 percent were not successful. It is therefore clear that many women (81%) are successful in their micro credit applications. Out of the hundred successful applicants, 41 percent of them had the amount they requested not rationed and 59 percent of them had the amount requested rationed.

Furthermore, the study results showed that the 123 applicants requested for an amount of GH¢7, 445.00 from the financial institutions out of which an amount of GH¢5, 743.00 representing about 77 percent was granted to them.

Table 4.7: Extent of access to micro credit by women from the financial institutions in 2009

Institutions	Amount applied for in GH¢ (A)	Mean amount applied for in GH¢	Amount received/GH¢ (R)	Mean amount received in GH¢	Percentage (%) Received = $(R/A)*100\% = Z$ (Extent of Access)
Financial NGOs	1, 745	58.17	1, 235	49.40	71
Savings and Loans Company	1, 215	36.82	1, 005	40.20	83
Rural banks	1, 980	63.87	1, 645	65.80	83
Credit Unions	2, 505	86.38	1, 858	74.32	74
Total	7, 445	60.53	5, 743	57.43	77

Source: Field Survey Data/Passbooks and application letters, 2010

The result in Table 4.7 shows that each of the 123 micro credit applicants applied for an average amount of GH¢60.53. The successful 100 applicants who were granted micro credit by the financial institutions received an average amount of GH¢57.43 each. Table 4.7 presents the extent of access to micro credit by women from the financial institutions in 2009.

On the average, applicants from all the four financial institutions studied are given about 77 percent of what they apply for. In simple terms, it means that if an individual woman applies for an amount of GH¢100.00 from any of these financial institutions, she is given about GH¢77.00. At the individual bank levels, it is seen from Table 4.7 that applicants to financial NGO have the least extent of access (71%) and those of Savings and Loans Companies and Rural Banks the highest (83%).

From the foregoing, it can be concluded that a higher percentage (95%) of women groups in the study area are successful in their micro credit applications to these financial institutions. Also, a higher percent (81%) of the women interviewed have been successful in their micro credit applications to these financial institutions. The successful applicants are given an average of about 77 percent of the amounts they apply for. These findings contradict the observations made by Al-Hassan and Bambangi (2006); Fletschner (2006); and Akudugu and Gbene (2005) that though women are micro creditworthy, they do not have access to micro credit. Contrary to that, women who are able to repay their micro credits (micro creditworthy) do have access to micro credit.

4.4 Comparing estimated income earnings of beneficiaries with non-beneficiaries

To determine whether or not there is any significant difference between the average income earnings of beneficiary and non-beneficiary respondents their incomes were obtained and the means tested using the t-Statistic. As shown in the results in Table 4.8, the mean income of beneficiary women is found to be GH¢221.77, that of the non-beneficiary women is GH¢166.00. The difference in income earnings between beneficiaries and non-beneficiaries in bank 1 was found to be the highest with 30 percentage points and that of bank 4 was the least with 17 percentage points (see Table 4.8). The overall difference in income earnings between the two income classes (beneficiaries and non-beneficiaries) was found to be about 25 percent (Table 4.8). This implies that if a beneficiary woman earned an amount of GH¢100.00 as income in 2009 non-beneficiary woman earned an amount of GH¢75.00 during the period.

Table 4.8: Comparing incomes of beneficiary and non-beneficiary respondents

Institutions	Non-beneficiaries' income (GH¢)	Beneficiaries' income (GH¢)	Percentage Difference in income earnings
Financial NGOs (1)	3, 908	5, 546	30
Savings and Loans Company (2)	4, 337	5, 954	27
Rural banks (3)	3, 91	5, 331	27
Credit Unions (4)	4, 437	5, 346	17
Total	16,600	22,177	25
Min.	100	117	
Max.	235	401	
Mean	166.00	221.77	
S.D.	35. 71	40.10	

Source: Field Survey Data, 2010

In determining whether or not the difference in the income earnings between beneficiary and non-beneficiary women is statistically significant, the t- test was employed and difference between the two income classes (beneficiary and non-beneficiary women) found to be significant at 1%. Since the beneficiary and non-beneficiary women were selected from the same communities, it can be assumed that they faced the similar socio-economic, political, cultural, natural, technical and institutional conditions among others in their income generating activities. On the basis of this assumption, it is concluded that access to micro credit is the intervention responsible for the difference in incomes, *ceteris paribus*. The low income earnings of the non-beneficiary women as relative to the beneficiaries can be the reason for non-beneficiaries not accessing micro credit This is because it has been observed in empirical literature that households and individuals with low income especially in developing countries have difficulty accessing credit (see Benito and Mumtaz, 2006; Del-Rio and Young, 2005; Crook and Hochguertel, 2005; Thaicharoen *et al*, 2004; Magri, 2002; Crook, 2001; and Arvai and Toth, 2001)

4.5 The logit regression results of factors influencing access to micro credit

To identify the impact of micro credit on performance of women logistic regression was used to predict the probability (propensity score) of access to micro credit or micro credit market participation (treatment) by the respondents. This was done using pre-treatment characteristics of the respondents which capture all observed relevant differences between (treated) and non-participants (control). Table 4.9 reports the parameter estimates for the logit model.

The logit regression gave a McFadden R – squared of about 0.64 which implies that all the explanatory variables included in the model are able to explain about 64

percent of the probability of access to micro credit from the financial institutions by women. The log likelihood ratio (LR) statistic is significant at 1 percent, meaning that all the variables included in the model jointly influence the probability of access to micro credit by women. Given these two goodness of fit measures, it can be concluded that the logit model used has integrity and is appropriate. The validity of the logit model in estimating access to micro credit is consistent with related studies by Akram *et al* (2008); Benerjee (2001); and Malik (1999).

As expected, age of respondents met the a priori expectation of positive relationship with the probability of access to micro credit from the institutions considered in this study. Contrary to the findings of Akram *et al* (2008); Benito and Mumtaz (2006); Thaicharoen *et al* (2004); and Crook (2001) that age is a significant micro credit constraint, this study did not find it to be a significant factor. Also, formal education attainment conformed to the a priori expectation and was found to be significant at 10%. This finding regarding formal education is consistent with the findings of Ayamga *et al* (2006); Thaicharoen *et al* (2004); and Arvai and Toth (2001) that formal schooling significantly influence participation in micro credit schemes.

Table 4.9: Logit regression results of factors influencing access to micro credit by the respondents

Variable	Coefficient	Std. Error	Marginal Effects of Significant Variables
Constant	-14.28253	6.670809	-
Age	0.439965	0.294767	-
Age squared	-0.005177	0.003356	0.258445
Perception of formal education	1.033778	0.612855*	-0.132053
Perception of application procedures	-0.528213	0.957261*	0.307718
Knowledge of different micro credit sources	0.308437	0.409218	-
Perception of income class	2.891007	0.901156***	0.722752
Perception of gender	0.953964	0.681720	-
Size or business	2.501652	0.831813***	0.625413
Membership to economic associations	2.814150	0.888605***	0.703538
Savings with financial institution	1.528788	0.618648***	0.382197
Type of business (Petty trading)	2.055189	0.717715***	0.513797
Perception of level of interest rate	-0.555499	0.738274**	-0.138875
Distance from residence to financial institution	-0.927085	0.615692**	-0.231771
Goodness of fit measures			
Log likelihood	-39.0401		
Restr. log likelihood	-108.6294		
McFadden R-squared	0.6406		
LR statistic (14 df)	239.1788***		

*** Significant at 1%; ** Significant at 5%; * Significant at 10%

Source: Field Survey Data, 2010

The perception of income class also met the apriori expectation of positive relationship with probability of access to micro credit and was found to be significant at 1%. The finding that income has a positive and significant influence on access to micro credit is consistent with the findings of Benito and Mumtaz (2006); Del-Rio and Young (2005); and Magri (2002) that income levels influence individuals' and households' decisions to source micro credit either for investment or consumption purposes. The perception of gender by women was found to be consistent with the apriori expectation but insignificant. Business size was also found to be positively related to the probability of access to micro credit, as expected and significant at 1%. Similarly, the perception of women regarding how cumbersome and long the application procedures are is negatively influencing their probability of access to micro credit from these financial institutions and was found to be significant at 10%. This finding of negative influence of application procedures is consistent with the findings of Nathan *et al* (2004) and Johnson (2004) that cumbersome application procedures deter people especially illiterates from applying for micro credit from formal sources. Membership to economic associations also conformed to the apriori expectation and was found to be significant at 1%. This implies that when women join economic associations, then their probability of access to micro credit will be increased. This finding is consistent with Armendariz and Morduch (2005) and Kah *et al* (2005) that formation of economic associations helps improve access to micro credit since there is a joint guarantee by association members. In addition, savings made with the financial institutions by the respondents positively relates to their probability of access to micro credit, as expected and was found to be significant at 1%. This finding of the positive and significant effect of savings on access to micro

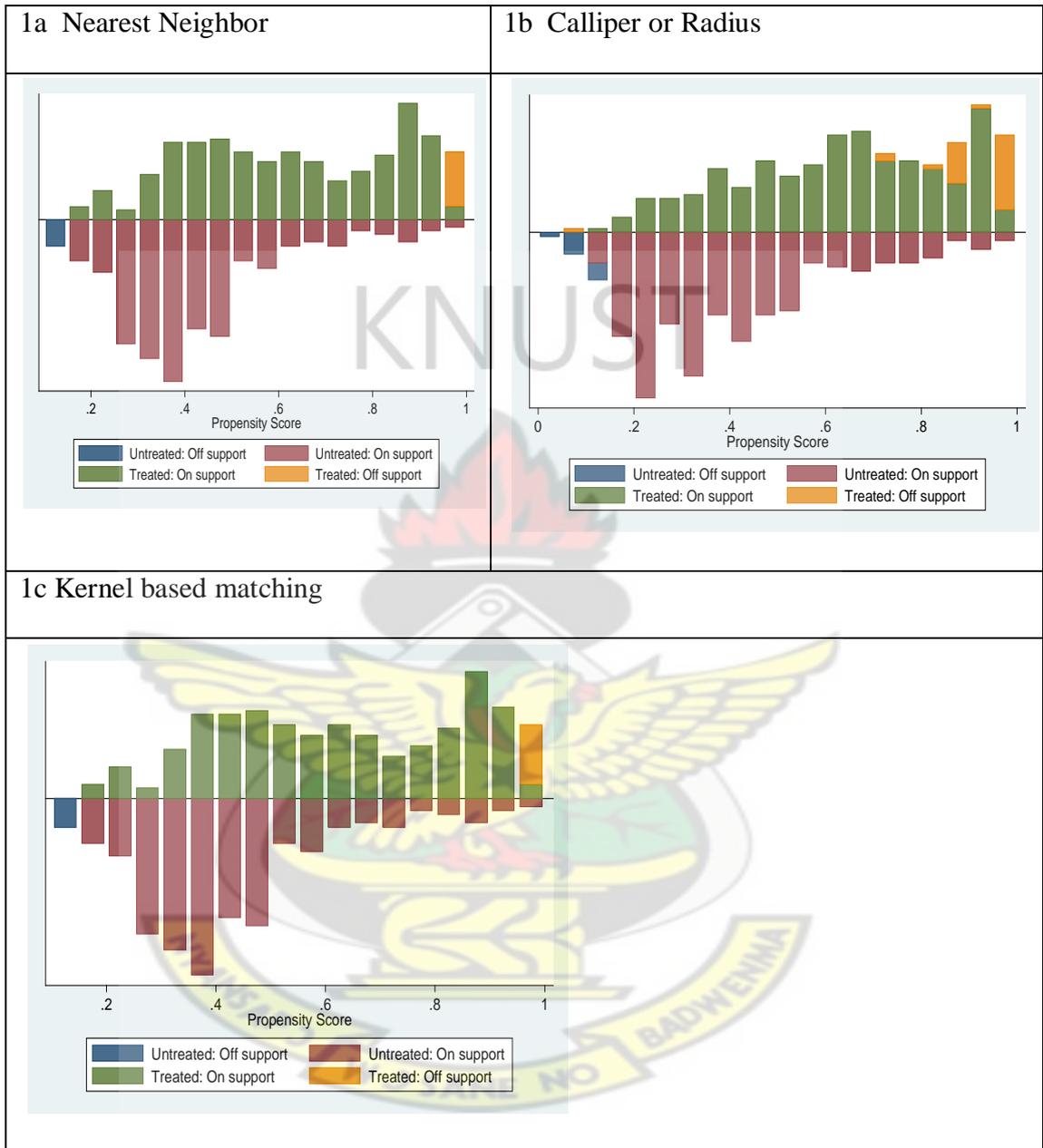
credit is supported by that of Akram *et al* (2008) that savings form a basic requirement of micro credit access in many formal financial institutions. The type of business petty trading also met the a priori expectation and was found to be significant at 1%. If women are into petty trading their probability of access to micro credit will increase. Besides, the perception of women on the high interest rate charged met the a priori expectation and was found to be significant at 5%. This finding of negative influence of interest rate charged on probability of access to micro credit is supported by that of *Business Week* (2005) and *Financial Express* (2005) that the exorbitant interest rates charged by financial institutions deter many people from applying for micro credit from such sources. Finally, the distance from the residence of respondents to the financial institution conformed to the a priori expectation and was found to be significant at 5%. The negative relationship between distance and access to micro credit by the respondents is consistent with the findings of Rahji and Fakayode (2009) and Ayamga *et al* (2008) that the closer the micro credit source, the higher the probability of access to micro credit and vice versa.

4.6 Impact of access to micro credit on women businesses

Based on the above results the impact of access to micro credit on women business performance was estimated using three performance measures: income levels, by matching each participants (treated) with similar non-participants (control) and then measure the difference as the ATT. Nearest Neighbour, Radius and Kernel base matching algorithm were used for the matching and estimation of ATT.

A visual presentation of the density distributions of the estimated propensity scores for the two groups (treated and control respondents) is shown in (figure4.1).

Figure4. 1: Histogram of propensity score for treated and control group of respondents.



These histograms illustrate the number of respondents who are on support and those off support. It can be seen that the common support condition is satisfied. There is substantial overlap in the distribution of the propensity scores of both treated and

control groups of the respondents' .The bottom half of the histograms show the propensity scores distribution for the control groups of respondents and the upper half refers to that of the treated.

The results of the treatment effects (ATT) for the women on income are estimated using all the three matching algorithms are presented in table 4.10.

Table 4.10 Estimated impact of access to micro credit on outcome variables (income).

Nearest Neighbour Matching (NNM)			
Outcomes	Income score in % of maximum average score		Average Treatment effect on the treated (ATT)
	Treated	untreated	
Income	10.8458	3.6939	7.1515** ((2.30)
NO. of observations	189	120	

Radius matching (RM) Radius matching with a calliper of 0.01			
Outcomes	Income score in % of maximum average score		Average Treatment effect on the treated (ATT)
	Treated	untreated	
Income	8.2547	2.3845	5.8702*** (3.21)
NO. of observations	161	151	

Kernel-based matching (KBM) using smoothening parameter of 0.06			
Outcomes	Income score in % of maximum average score		Average Treatment effect on the treated (ATT)
	Treated	untreated	
Income	2.998	2.998	4.5294** (2.10)
NO. of observations	Of 178	155	

Note t-statistics are in parenthesis *** denotes significant at 1% ** denotes significant at 5% * denotes significant at 10%

Source: Own calculations

The nearest neighbour estimate of the ATT of micro credit on income level of the respondents recorded statistically significant increase of 715%. This implies that women who participated in micro credit has significantly increase their earnings by 7.1515 compared to control group (non-participants). This increase is statistically different from zero.

In the case of calliper or radius matching we consider neighbours with a calliper of 0.01. The results shows 587% increase in income as a result of women participation in micro credit facilities with statistically significant t-statistics of 3.21. With regards to Kernel base matching algorithm each treated respondents (participants) is matched with a weighted average of all control respondents (non-participants) with weights that are inversely proportional to the distance between the propensity score of the participants and non-participants. In this study we used a smoothening parameter of 0.06 as recommended by Silverman (1986). The average treatment of the treated (ATT) effect on income shows an increased impact of 4.5294 which is statistically different from zero at 5% significant level. All the matching techniques produced consistent estimates of the treatment effects of access to micro credit on income of the respondents Table 4.11 presents results from covariate balancing tests before and after matching which give the indication of matching quality. The results show substantial reduction in absolute bias for all the outcome variables for the three matching algorithms. As indicated in the table, the mean bias after matching lies below the 20% level suggested by Rosenbaum and Rubin (1985). This indicates that the variables were significantly balanced as a result of the propensity score matching procedure. In addition, the pseudo- R^2 's after matching are fairly low with none of the F-statistics

being significantly different from zero, suggesting that the proposed specification of the propensity score is fairly successful in terms of balancing the distribution of covariates between the two groups treated and control (Sianesi, 2004).

Table 4.11: indicators of matching quality before and after matching

Matching algorithm	Outcome indicator	R ² unmatched	R ² matched	P-value unmatched	P-value matched	Mean absolute bias unmatched	Mean absolute bias matched	Absolute bias reduction
Radius or Calliper	Income	0.209	0.021	0.000	0.399	21.6	7.6	64.7
Nearest Neighbour	Income	0.209	0.017	0.000	0.555	21.6	5.8	73.0
Kernel base Matching	Income	0.213	0.026	0.000	0.268	21.6	5.6	73.0

Source: Own calculations.

Generally, the results show that respondents who participated in micro credit programmes had higher income as compared with control group. Thus access to micro credit by the respondents has to generate significant gain in terms of income.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The main objective of the study was to analyse the impact of access to micro credit on performance of women business in Agona West and East districts of Central Region of Ghana. The first specific objective was to identify and describe the intervention packages offered to the respondents and this was achieved through categorization and descriptive writing. The second specific objective was to identify and estimate the factors that influence the extent of access to micro credit by the respondents and this was achieved using the logit model. The third specific objective was to find out the impact of access to micro credit on performance of women businesses and this was achieved through use of propensity score matching analysis, perceptions analysis, testing of means of income earnings using the t- statistic and regression analysis.

5.1 Summary and Conclusions

Primary data were collected from 200 respondents in 20 villages and towns of two districts in the Central Region, namely Agona West municipality and Agona East District and managers of financial NGOs, Savings and loan companies , rural banks and micro credit unions operating in the study area. Time series primary data were obtained from the passbooks of women on their savings and micro credit accessed as well as archives of the financial institutions for micro credit delivery from 2005 to 2009. A predominantly semi-structured questionnaire was used for the collection of qualitative and quantitative data. Key informant interviews, and personal observations were the other data collection and validation techniques used.

Two main empirical analyses were carried out. These were the logit, and propensity score matching analyses. The logit model was used to identify the factors that influence women probability of access to micro credit from the financial institutions. The propensity score matching was used to estimate the impact of access to micro credit on the performance of the respondents.

First, the results from the study indicate that women are heterogeneous, particularly in their business and family sizes, the type of business they carry out (petty trading or food processing) their savings behaviour, social interactions through solidarity and economic associations and level of education. Despite their heterogeneity, the financial institutions still provide financial services to them for their investment and consumption activities.

Secondly, the study showed that micro credit offered to women by the financial institutions operating in the study area, is a package that consists of formations of economic associations savings opportunities, in which groups are encouraged to open joint savings accounts with the financial institutions to enable them save their extra income and to be able to access micro credit. The institutions also offer micro credit to women and this micro credit consists of the principal amount, interest of between 22 percent and 27 percent and the processing or commitment fee of 3 percent of principal amount.

The study also found that from 2007 to 2009, about 95 percent of the economic associations that applied for micro credit from the rural banks were granted. The groups of associations were given about 66 percent of the amount applied for over the period. About 62 percent of the respondents interviewed also accessed savings opportunities from the four types of financial institutions in the study area. During the

same period (2009), about 62 percent of respondents applied for micro credit from these institutions (see Table 4.6: 82). Out of the total number of respondents who applied for micro credit, about 81 percent of them were given.

Third, the study showed that formal education, perception of application procedures, level of income, membership to economic associations, savings with financial institutions, the type of business, the perception of interest charged and the distance from respondents' residence to the financial institution are the factors that influence respondents' probability of access to micro credit from the financial institutions.

Fifth, the study revealed that women in the Agona West and East Districts generally perceive that, there have been, improvement in their income level, food security, access to education, access to health care and sustainable natural resource use. A statistical examination of the differences of perceptions between beneficiary and non-beneficiary women proved that, there is significant difference between the two (beneficiary and non-beneficiary women). In other words, more beneficiary women perceive that there is improvement in their income levels than non-beneficiary women. Singling income out because of its role in buying food, paying school fees, medical bills and investments all of which are components of livelihoods, it was found that the average income earnings of beneficiary women are about 25 percent higher than that of non-beneficiary women. It was also found that micro credit funds from the financial institutions have positive impact on the income earnings of beneficiary women.

From the above, it can be concluded that micro credit offered by the financial institutions in the study area, positively and significantly contributes to the income levels of women in the districts. The direct effect of the micro credit is on income

which is translated into payment of medical bills and school fees, buying of food to ensure food security, performances of socio-cultural rites such as funerals, marriages and naming ceremonies as well as savings as a main source of equity funds for investment in business expansion.

Generally, the results show that respondents who participated in micro credit programme had higher income as compared with control group. Thus access to micro credit by the respondents has to generate significant gain in terms of income

5.2 Recommendations

Based on the results obtained from the study, the following recommendations are made:

- i. The financial institution in the study area offer micro credit to the respondents who are heterogeneous in nature. This is a very good work by the financial institutions and should be continued and expanded to cover a lot more women to ensure micro credit widening.
- ii. Giving the relevance of grass-root economic associations in driving local level participation in governance, social and economic development, it is recommended that the existing associations formed by the financial institutions should be strengthened and sustained and new ones formed. Also, Governmental and Non-Governmental Organisations that work to empower women should adopt formation of economic associations in delivering their interventions. This will ensure that empowerment is participatory, which is critical for sustainable livelihoods development, since the decision to join an economic association in most cases is internally driven.

- iii. Women who are not in associations are encouraged to join existing ones or form their own so as to improve their chances of accessing micro credit from the financial institutions.
- iv. The number of groups applying for micro credit from the financial institutions is on the decline. The Department of Cooperatives should therefore do more to halt and reverse this trend by strengthening the existing ones, revamping collapsed ones and encouraging the formation of new ones. This is crucial for improved performance of businesses since micro credit offered by the financial institutions is mostly by groups than individuals.
- v. The perceptions of women regarding the operations of the financial institutions influence their extent of access to micro credit. The need to create awareness of what the financial institutions offer and what is required to access what is being offered through public education is long overdue. It is therefore recommended that, the financial institutions NGOs in development and the Non-Functional Literacy Division of the Ministry of Education (MoE) should come out with an educational package that will help give the right information to women and other vulnerable groups, regarding what the financial institutions offer and who can access what is being offered.
- vi. Giving that savings, influence the level of access to micro credit from the financial institutions by women, it is recommended that all women should endeavour to make some savings with the financial institutions to improve their chance of access to micro credit.
- vii. The distance from the houses of women to the financial institutions also negatively influences access to micro credit from the financial institutions. It is

recommended that the government should encourage expansion of the services of these financial institutions by way of tax incentives. This will reduce the long distance effect.

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APPENDIX A:

QUESTIONNAIRE

Household's General Information

1. Age..... 2. Gender: Male [] Female []
 3. Marital status [1] Single [2] Married [3] Divorced [4] Separated [5] Widow
 4. Are you the head of the household? [1] Yes [2] No
 5. Number of Household's members.....
 - 6a. What is your main occupation?.....
 - b. Spouse's Occupation.....
 - c. Other sources of income.....
 8. How many people depend on you?.....
 9. How many children are in your household?
 10. Do the children go to school?.....
 11. How many are in? [1] Basic..... [2] Secondary.....
[3] Tertiary
 12. If in basics Schools are they in [1] Public Schools [2] Private Schools
 13. Expenditure on your children's education per month
- Credit History**
14. Do you receive credit from any MFI? [1]Yes [2] No (*If No, skip to 20.*)
 15. Length of membership with the MFI. [1] one week-1month [2] 2months- 6mths
[3] 7months- 1year [4] more than one year
 16. Have you received your first loan [1] Yes [2] No
 17. What are you going to use the loan for.....
 18. (a) How much did you get in your first credit from the MFI?.....
(b) How much did you apply for.....
 19. (a) How much did you get in your last credit from the MFI?.....
(b) How much did you apply for.....
 20. (a) Do you have voluntary saving in the MFI? [1] Yes [2] No
(b). Number of other household borrowers.....

21. How many members of your household work?.....
22. How many members of your household have a wage-earning job?.....
23. In case of having wage earning job, how much do they receive from employment (monthly)...
24. What is the household's income per month?
26. What is the household's expense per month (excluding repayments to credits and unexpected events)?.....
27. What is the expenditure on food per month?.....
28. Is your house? [1] Rented [2] Owned [3] Borrowed (b) If rented, how much do you pay a month?.....
29. If owned, how did you get (build) your house? [1] I got a credit [2] I used my savings [3] I sold a physical asset [4] I inherited it [5] I live with my parents [1] Yes [2] No
31. If yes, where did you get the money from?
 [1] Credit from MFI [2] Savings at MFI [3] I sold out household's assets [4] I receive money from my relatives living abroad [5] Credit/Saving from other sources
 Household's Physical Capital (Business Assets)
33. In case of having a micro enterprise (or self-employment activity), what is the value of your assets?.....
34. How did you get your assets? [1] Credit [2] Savings [3] selling out properties or assets
 [4] I inherited it.
35. Has there been any structural improvement in your business since joining the MFI? [1] Yes
 [2] No
36. Have you purchased any new assets/ in you business after taking the credit [1] Yes
 [2] No
37. How would you describe your business since joining the MFI?

[1] Much worse now [2] A little worse now [3] Same [4] A little better now [5] Much better

now [6] Don't know

38. What is the range of your profit per week?.....

39. What is your profit per month?.....

EDUCATION

40. What is your education level? [1] Primary [2] JSS [4] Secondary [5] Tertiary

41. Have you recently taken training courses? [1] Yes [2] No

42. What kind of training was it. [1] Business Management [2] Health Education [3]

Non-formal

Education

43. Have you stopped sending your children to the school due to economic problems?

[1]

Yes [2] No

44. How is the General health status of your family? [1] Very good [2] Good [3]

Regular

[4] Bad

45. Have you registered for the National Health Insurance Scheme? [1] Yes [2] No

46. What do you do to deal with health problems?

[1] I go to the NHIS; public hospitals [2] I sold out a household asset [3] I use my savings [4]

I use part of my credit from the MFI [5] Ask for credit from informal agent (family, friend

and moneylender) [6] I ask money to my relatives living abroad

47. How did you know about the MFIs? [1] From a friend or relative [2] From

advertisement/promoter [3] It is near home/business

48. What is the product that interest you most to join the MFI? [1] Savings [2] Credit

[3] Insurance

49. How far is the MFI from your home/business? [1] Less than 10 minutes walk [2] between 10

and 20 minutes walk [3] between 20 and 30 minutes walk [4] More than 30 minutes walk

50. How do you get to the MFIs? [1] By walking [2] by public transportation [3] by own car,

bicycle or other vehicle [4] they come to my house

51. Have you faced problems to repay the credit? [1]Yes [2] No 51b.

Reasons.....

52. (a) Have you faced any problem in the last 6 months? [1] Yes [2] No

(b) What happened? [1] Poor sales performance in the business [2] I lost my job [3] Illness of

one of the household's members [4] Robbery or assault [5] Indebtedness

53. Have you sold off some of your assets to pay back the credit to the MFI? [1] Yes [2] No

54. If yes, what assets had you sold out? [1] House [2] Clothing [3] Land [4] Animals [5] Farm Produce [6] Electronics, or other assets

55. Number of other credit institutions you know.....

56. Do you receive money from relatives or friends living abroad? [1] Yes [2] No

57. How often do you receive money? [1] Every two weeks [2] Every month [3] Every two

months [4] Occasionally

58. What type of business do you have? [1] Manufacturing [2] Commerce(Trading) [3] Services

(restaurant, mechanics) [4]Agriculture (Farming) [5]No business

59. Are you the owner of the business [1]Yes [2] No

60. Where do you have your business? [1] At home [2] In a rented premise [3] In a owned

premise (not at home) [4] On the street market

61. When did you start the business? (Years ago).....

62. Where did you get the money from to start your business? [1] a gift (inheritance) [2] credit

[3] savings [4] By selling out properties or assets [5]Given to me by relatives

63. If savings, where do you deposit? [1] Formal institutions [2] MFI [3] informal mechanisms
64. If credit, where did you get the credit from? [1] Formal institutions [2] MFI [3] Informal agents
65. How many employees do work in your business? (non-household's members).....
66. In case of having employees, what is the salary per week (individual)?.....
67. How many hours do you work a day?.....
68. How many days do you work a week?.....
69. What are the revenues of your business per week?
70. How would you describe financial situation since having your own business?
 [1] Much worse now [2] A little worse now [3] Same [4] A little better now
 [5] Much better now [6] I don't know
71. Since receiving the loan do you feel like your life has improved [1] Yes [2] No
72. Have receiving the loans been beneficial to you? [1] Yes [2] No



APPENDIX B:

Interview Guide

The interview guide was used to collect data. The study employed semi-structured interview format..

Prior to the use of the interview guide, interviewees were expected to provide bio-demographic information such as age, marital status, occupation, number of dependents (if any). This information should give a good picture of service users and their households in general.

Interview Guide

I. Group Liability Scheme

1. How did you become a member of your group?
2. How long have you been together? (Probe: how is group sustained? dropouts?)
3. How often do you meet? If you do, tell me about such meetings?
4. What is the relationship between your group and the institution?
5. What change(s) will you like to see in your group?
6. What do you particularly like about your group?
 1. Apart from financial services, can you identify other services that the institution offers?
(Probe: offers training on group activities, setting up business, technical advice?).
If any, how helpful were they?
 2. Did you have any non-financial services from the institution? (explain) If yes. What were they?
 3. In your opinion, do/did you require any non-financial services? (explain further)
 4. What non-financial services will you like the institution to provide and why?

IV. Interest Rates

1. What is the interest rate charged/given on loan/savings? What is your opinion about that?
2. Do you borrow money from elsewhere? If yes, how does it (interest rate) compare with what is charged elsewhere?

APPENDIX C:

MICROFINANCE INSTITUTIONS OFFERING FINANCIAL SERVICES IN THE STUDY AREA

1. RURAL BANKS

- Agona Rural Bank
- Nyakrom Rural Bank
- Akyempem Rural Bank
- Union Rural Bank

2. LOANS AND SAVINGS COMPANIES

- Express Savings And Loans
- Jefam Financial Services
- Allied Wealth Savings And Loans
- Sinapi Aba Trust

3. CREDIT UNIONS

- Swedru Teachers Cooperative Credit Union
- Methodist Church Credit Union
- Nsaba Community Credit Union.