THE IMPACT OF COMMUNITY SAVINGS AND INVESTMENT PROMOTION PROGRAM ON HOUSEHOLD INCOME AND CREDIT MARKET PARTICIPATION IN KASUNGU DISTRICT, CENTRAL MALAWI

COLLABORATIVE MASTER OF SCIENCE (AGRICULTURAL AND APPLIED ECONOMICS) THESIS

OBED GILBERT FREDRICK MWALUGHALI

UNIVERSITY OF MALAWI

BUNDA COLLEGE OF AGRICULTURE

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OBED GILBERT FREDRICK MWALUGHALI

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MARCH, 2013

DECLARATION

I Obed Gilbert Fredrick Mwalughali, declare that this thesis is a result of my own original effort and work, and that to the best of my knowledge, the findings have never been previously presented to the University of Malawi or elsewhere for the award of any academic qualification. Where assistance was sought, it has been accordingly acknowledged.

Obed Gilbert Fredrick Mwalughali

Signature: _____

Date: _____

CERTIFICATE OF APPROVAL

We, the undersigned, certify that this thesis is a result of the author's own work, and that to the best of our knowledge, it has not been submitted for any other academic qualification within the University of Malawi or elsewhere. The thesis is acceptable in form and content, and that satisfactory knowledge of the field covered by the thesis was demonstrated by the candidate through an oral examination held on 17th January 2013.

Major Supervisor: Prof. Davies Ng'ong'ola

Signature: _____

Date: _____

Supervisor: Dr. Mannex Mwabumba

Signature: _____

Date: _____

DEDICATION

To my mother, for giving me the wings to fly; to my father for giving me the reason to

fight. You hold a special place in my heart. Parents, because of you I can!!

ACKNOWLEDGEMENT

ABSTRACT

This study analyses the impact of Community Savings and Investment Program (COMSIP) activities on household income and credit of member households of COMSIP groups in Kasungu District in Central Malawi. COMSIP groups are a form of village-based microcredit and community-based savings institutions with a number of socio-economic functions. The functions include mobilization of communities to save and/or invest their resources into income generating initiatives and provide credit.

Using data from COMSIP Cooperative Union limited for Kasungu District in Malawi on income per capita and access to credit, this study tests the hypothesis that these variables were positively impacted on by membership to these COMSIP groups. The study uses Instrumental Variables (IV) methodology organized to reduce selection bias as well as endogeneity problems in the sample. The primary data on socio-economic and demographic variables was collected using household questionnaires, Key Informant Interviews and literature review as tools from a sample of 150 households. The study found that the variables such as sex of household head, age of household head, credit per capita, land per capita and distance of location of household to the COMSIP office, determine household decision to join COMSIP groups.

Instrumental Variables analysis results show that the effect of COMSIP groups on household income and credit is very strong. The IV estimates indicate an increase of 88% income per capita and 96% increase in credit per capita of relatively poor participating households was significant at 5% and 1% levels of significance respectively. The findings also indicate that the simple targeting mechanism of COMSIP program based on household

land ownership is effective. Thus, the efficiency of the COMSIP program can be enhanced by allocating credit to households with marginal landholding, for which the impact is the greatest.

Although microfinance programs, especially among the rural poor people living below the standard poverty line of one US dollar per day have elicited different reactions from different stakeholders, there seems to be a general agreement that the program is useful amongst the strategies for ensuring improved household income and credit of rural Malawians, hence reduced poverty in the long-run.

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INTRODUCTION

1.1   Background of the Study

The Community Savings and Investment Promotion Program (COMSIP) Cooperatives Union Limited, established in 2003, has since evolved from a component under Malawi Social Action Fund (MASAF) III to an independent institution with its own board of directors and registered in 2006 under the Cooperative Society Act of 1998. It serves its primary cooperatives that are emerging from COMSIP groups (Tsegaye, 2003).

In pursuing its original design and implementation principles, the COMSIP Cooperative Union Limited facilitates the transformation of social capital into economic capital aimed at creating a framework within which communities could form cooperatives and mobilize savings from within themselves. The members of the primary cooperatives then utilize their saved incomes to prudently invest in productive ventures in various sectors such as small-scale businesses and agricultural production. To be effective, COMSIP Cooperative Union Limited creates entrepreneurship culture among members of primary cooperatives in micro businesses and agribusiness, thus making the rural poor more productive in generating income and eventually more likely to save. The Mission is to sustainably empower ordinary Malawians through member-owned community savings and investment cooperatives. In order to achieve its mission, activities are drawn based on the long term objectives such as building culture of saving and investment amongst indigenous Malawians to create opportunities for urban and rural communities to access financial and market services; to create an entrepreneurial culture and develop small businesses

management skills among beneficiaries. The Union covers the entire country and its client base includes rural and peri-urban communities eager to engage in savings and sustainable enterprises at individual group levels. The program believes that providing high quality saving services is the way to access relatively cheap capital that can be used to increase outreach, increase lending, maintain portfolio quality, increase productivity, and reduce poverty and vulnerability. The other crucial role of COMSIP cooperatives/groups[1] is that of easing farmers' access to credit-lending institutions as long as they are members. It is relatively easy for members of cooperatives/groups to access credits for several reasons. Firstly, the leaders of the cooperative even if chosen among farmers are in most cases relatively well trained and they know how to negotiate with credit lending institutions. Secondly, membership to cooperatives/groups gives individual farmers some credibility and it is this credibility that acts like an asset for credit acquisition. Membership to a group reduces the probability of default hence reduces the likelihood that the lending company will not recover its loans. Thus, the creditor has high propensity to lend out to people in groups than to individuals. Even if individual farmers default, in most cases leaders of their cooperatives/groups arrange payment on behalf of the defaulting individual, though defaulter may be disciplined thereafter (Tsegaye, 2003).

1.2   Income and Credit Structures in Malawi

Microfinance activities started before independence, but there were only a few participants until between 1993 and 2001 which experienced an increase in microfinance institutions and credit granting non-governmental organizations (NGOs) from seven to about twenty

[1] Words COMSIP groups and COMSIP cooperatives are being used interchangeably because COMSIP Cooperative Union Limited has formed both of them having the same COMSIP activities in Kasungu district.

nine to date (Chirwa, 2002). Development policy shifts of the 1990s focusing on poverty alleviation and the successes from experiences of the Grameen Bank and other micro finance institutions in the East Asia region and Latin America for making credit accessible to the poor have contributed to increased microfinance activities (Chirwa, 2002).

Income and credit structures and their services are categorized into informal, formal and semi-formal sectors. The informal sector, which is the largest, include saving at home, Savings Clubs, Rotating Savings and Credit Associations (ROSCAs), Accumulated Savings and Credit Associations (ASCAs) and others (Mutesasira et al., 1999; Steel and Aryeetey, 1994). Services in the informal sector are readily accessible with low transaction costs and their relative flexibility in service provision tends to attract the majority who are not reached by the formal banking sector. There is however, a very high price that the poor pay in terms of high risk and low or negative interest rates for such services. Savings may be exposed to theft, destroyed by fire and animals and may be lost due to dishonesty apart from temptation to spend and demands from relatives and friends for assistance.

The formal sector, which includes banks and insurance companies, are subject to banking laws of a country, they provide conventional retail facilities and engage in a wide range of financial intermediation including savings accounts, current accounts, deposit accounts and loan accounts (Kirkpatrick and Maimbo, 2002). Formal financial institutions have a disadvantage in savings mobilization because of their concentration in urban areas with no or poor branch network in rural areas, they demand high opening and minimum account balances to the disadvantage of the poor who may not be able to set aside such high amounts. The poor also find the formal banks to be inconvenient because of inconvenient opening hours, complicated transaction costs relating to travel and waiting.

The semi-formal sector comprises microfinance institutions that are formally organized but without full legal ability to accept and intermediate deposits. These include NGOs or banks with special charter. They are Village Savings and loans being organized by some NGOs, Village banks, self help groups or member savings being undertaken by micro credit NGOs (Kirkpatrick and Maimbo, 2002; Mutesasira et al., 1999; Johnson and Rogaly, 1997).

In Malawi, microfinance services are predominantly provided by NGOs, companies limited by guarantee, Savings and Credit Cooperatives (SACCOs), government owned banks (e. g. MSB) and government supported programmes dominating the sector such as the COMSIPs, Youth Enterprise Development (YED), Malawi Rural Development Enterprise Fund (MARDEF) and Malawi Rural Finance Company Limited (MRFC). According to the USAID AMAP Microfinance sector assessment of Malawi, government supported initiatives provide 70% of credit and 80% of savings services (Burrit, 2006).

The Government of Malawi, through the Ministry of Youth, Sports and Culture (MYSC), the Malawi Rural Finance Company Limited (MRFC) and Commonwealth Youth Credit Initiative/Youth Enterprise Development (CYCI/YED) programme in Malawi and MRFC implemented the project with credit fund amounting to £27, 000 through its network of field offices targeting with a target population 200 young men and women in four Traditional Authorities (TAs) where seventeen groups were mobilized with total membership of 176 (Phiri, 2004). Several NGOs also contribute to microfinance services including CARE International, World Vision, CRS, Save the Children, Salvation Army, Emmanuel International and Africare. These NGOs are mainly involved in micro-credit scheme known as Village Savings and Loans Scheme, a component of food security.

Dominated by loan products at the expense of the savings services, the various suppliers have not gone beyond the large cities and secondary towns to serve the rural communities. Further, Tsegaye (2003) observes that most microfinance institutions have been heavily dependent on donor funding and only a few have been able to provide deposit services and therefore have minor impact on savings mobilization.

1.3   Statement of the Problem

As evidenced in most African countries, creating viable financial institutions in rural Malawi is challenging. The majority of the rural population lives below the poverty line. The overall macroeconomic condition is not conducive to such development. Poverty affects rural Malawi more than urban areas. The key constraints on capital are the absence of mobilization of local savings and lack of access to credit. There is low rate of access to credits, between 9% and 16%, attributed to inadequate number of microfinance service providers and underdeveloped infrastructure, which result in the high cost of credit service delivery (Tsegaye, 2003).

Lack of clarity over the objective of COMSIP cooperatives/groups among the local authorities and politicians has created an environment of uncertainty that has led to collapse of many COMSIP cooperatives/groups. This is coupled with the fact that the development of microfinance institutions (MFIs) in Malawi is in its infancy stage. The existing formal or informal financial institutions do not yet serve the rural poor. The few microfinance institutions, which have been introduced by government with support from development partners, and some NGOs have also been concentrated in urban and semi-urban areas. The savings and credit cooperatives and micro-credit institutions have not

reached the rural poor for reasons such as high risk, high cost of service and a narrow market (Kishindo, 2000). The country's two major commercial banks closed virtually all mobile banking units and many rural branches in response to liberalization and nationalization. The Post Office Savings Bank (POSB) spun off, its savings operations to the Malawi Savings Bank (MSB) in 1994, Post Office Savings Bank was, until 1994, its savings organization and the most accessible for rural households, with 158 post offices and 126 post agencies, low deposit, minimum's relative ease of transaction and money movement (Tsegaye, 2003).

There is not in depth studies on the assessment of impact of Community Savings and Investment Promotion (COMSIP) initiative activities on households' income and credit. Therefore, this study will fill the gap and make a contribution to policy recommendations as regards the rural financial services development, credit institutions accessibility to rural poor and introduction of savings groups among the rural poor. The government intends to expand program and already supports some rural people through the Local Development Fund that is being disbursed into these COMSIP groups through the district councils.

1.4   Rationale of the Study

The Government of Malawi has recognized the role of microfinance and has put in place a Microfinance Policy since October 2002. It recognizes savings opportunities, access to credit and other financial services as major constraints to enterprise development among the micro-enterprises (Barnett, 2008).

The high levels of poverty combined with low economic growth in the formal sector have forced a large part of Malawi's population to search for self-employment in activities not

part of the formal economy. This group of people can be assisted by developing a financial sector capable of meeting the full range of demand for financial services. Raising the capacity of the rural poor and the self-employed to sustain economic activities is essential for their survival. Internationally, a variety of financial institutions have found ways to make lending to the poor sustainable and to build on the fact that even the self-employed poor repay their loans and seek savings opportunities. The challenge in Malawi, therefore, is to build capacity in the financial sector so that it is capable of responding to the demand posed by micro, small and medium enterprises (Tsegaye, 2003).

The practical way of providing financial services to the rural poor is through rejuvenating and creating more of community-based savings and investment vehicles that focus on the participation of the poor, especially poor women. According to the MASAF findings (Tsegaye, 2003), the poor are eager and determined to save if the opportunity is made available. They can be organized and take leadership. They require more guidance, training and financial development assistance than the urban and semi-urban MFI clients do, but they offer the advantage that they can easily be mobilized into groups that are able to give loans to people in their own communities and recover the money with interest. Such intervention requires long-term institutional and financial support. Small, poor communities can not become sustainable in a short period due to their small size, low absorptive capacity, high illiteracy and lack of exposure to the MFIs best practices (Kishindo, 2001).

The findings of this study have wider relevance for other stakeholders carrying out social development programmes. Of particular interest is the Local Development Fund (LDF); a

funding mechanism through which donor inflows for local development (i.e. basic services provision such as in water supply and sanitation, healthcare, education and roads) are channeled. The LDF builds on earlier work under the auspices of the District Development Fund (DDF), and aims to empower district councils to respond to priority development concerns of local communities by providing easily accessible financial resources for local development.

The findings will also assist the communities in the study area to know their stand in terms of the extent to which the micro credit schemes operating in their area contribute towards the promotion of saving culture among the communities through the investments in enterprises after credit acquisition. The communities will be able to establish whether participation in micro credit schemes increases their savings, hence income levels.

There are many institutional and organizational arrangements that encourage delivery of credits to promote investments in rural communities. The study's focus and its findings will assist to sensitize the communities whether these micro finance schemes are having good practices to move rural communities out of poverty. This will finally call for deliberate government policy and strategies to mobilize savings including from rural poor households in the study area to increase resources for investment building on the study findings as the basis.

1.5   Objectives

1.5.1   Underlying Objective

The underlying objective of the study was to assess the impact of COMSIP activities on household income and credit.

1.5.2   Specific Objectives

Specific objectives of the study were:

1. To identify the factors that influence household decisions to join the COMSIP group;

2. To determine the impact of COMSIP activities on household incomes for smallholder farmers; and

3. To determine the effect of COMSIP membership on household credit market participation.

1.6   Research Questions

The study addressed the following questions:

- Have activities of COMSIP initiatives improved household income and access to credit?

- Are there any factors influencing household decisions to join the COMSIP cooperative groups?

1.7   Research Hypotheses

The study tested the following null hypotheses

(i) Membership in COMSIP cooperative groups has not led to increased income of the households;

(ii) Membership in COMSIP cooperative groups has not increased credit per capita of households; and

(iii) Socio-economic, demographic and institutional factors do not influence a household's decision to join a COMSIP cooperative group.

CHAPTER 2

LITERATURE REVIEW

2.1   Concept of Cooperation

Cooperation has been the very basis of human civilization. The inter-dependent and the mutual help among human beings have been the basis of social life. It is the lesson of universal social history that man cannot live by himself and for himself alone. Since the beginning of human society, individuals have found advantage in working together and helping one another in all over the world (Tsegaye, 2003). In Malawi too, it is common for people to be inter-dependent in mutual help and self-help activities in their day-to-day socio-economic conditions. The traditional cooperatives/groups are traditional form of associations, which should be basis to modern form of cooperatives/groups in Malawi.

The cooperative model has been adapted to numerous and varied businesses in 1942. Ivan Emilanoff, a cooperative scholar, remarked that diversity of cooperatives is Kaleidoscopic and their variability is likely infinite (Kimberly and Cropp, 2004). Because of this diversity, no universally accepted definition of a cooperative exists. Two definitions, however, are commonly used:

(a) A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise (International Cooperative Alliance [ICA], 1995).

Cooperative leaders around the world recognize the ICA, a non – governmental organization as a leading authority on cooperative definition and values. The ICA

definition recognizes the essential elements of cooperatives; membership is voluntarily, coercion (force) is the antithesis (contrast) of co-operation. Persons compelled to act contrary to their wishes are not truly cooperating. True cooperation with others arises from a belief in mutual help; it cannot be dictated in authentic cooperatives, persons join voluntarily and have the freedom to quit the cooperative at any time (Chambo, 2009).

(b) Another widely accepted cooperative definition is the one adopted by the United Sates Department of Agriculture (USDA) in 1987. "A cooperative is a user-owned, user-controlled business that distributes benefits on the basis of use." This definition captures what are generally considered the three primary cooperative principles such as user ownership, user control and proportional distribution of benefits (Chambo, 2009).

The "user owner" principle implies that the people who use the cooperative members help finance the cooperative and therefore, own the cooperative. Members are responsible for providing at least some of the cooperatives' capital. The equity capital contribution of each member should be in equal proportion to that member's use (patronage) of the cooperative. This shared financing creates joint ownership, which is part of the ICA cooperative definition.

The "user- control" concept means that members of cooperatives govern the business directly by voting on significant and long-term business decisions and indirectly through their representatives on the board of directors. Cooperative statues and by-laws usually dictate that only active cooperative members (those who use the cooperative) can become voting directors, although non-members sometimes serve on boards in a non-voting, advisory capacity. Only cooperative members can vote to elect their board of directors and

on other cooperative actions. Voting rights are generally tied to membership status-usually one member, one-vote and not to the level of investment in or patronage of the cooperative. Sometimes instead of one vote per member, voting rights are based on the volume of business the member transacted the previous year with the cooperative. Generally, however, there is also a maximum number of votes any member may cast to prevent control by minority of members. For example, a grain cooperative might permit one vote to be cast for each 1,000 bushels of grain marketed the year before, but any single member would be limited to a maximum of ten votes.

Democratic control is maintained by trying voting rights to patronage. Equitable voting rights, or democratic control (as written in the ICA definition), are a hallmark of cooperative. "Distribution of benefits on the basis of use," under this principle, members should share the benefits, costs, and risks of doing business in equal proportion to their patronage. The proportional basis is fair, easily explained and entirely feasible from an operational standpoint. To do otherwise distorts the individual contributions of members and diminishes their incentives to join and patronize the cooperative. Cooperative benefits may include better prices for goods and services, improved services, and dependable sources of inputs and markets for outputs. Most cooperatives also realize annual net profits, all or part of which are returned to members in aptly called patronage refunds (Chambo, 2009).

2.2   COMSIP Initiatives

The COMSIP program assists the rural poor communities to promote and organize Community Savings and Investment cooperatives (COMSICs). A COMSIC is organized as

not-for-profit microfinance institution to serve the poor rural communities within a specified area of operation, preferably consisting of a group of villages under group headman**.** COMSIP assists Community Savings and Investment Groups (COM Groups) and COMSICs in promotion and development, financial management, savings mobilization, credit management, capacity building, skill development, governance and business development services to expand sustainable community savings and investment institutions (Tsegaye, 2003).

At the village level, individuals organize themselves as Community Savings and Investment Groups (COM Group). These groups have between 20 and 30 members. Any person living within the area of operation in a village is eligible to join a COM group. All initial transaction from the application for membership to the acceptance of savings and the disbursement of loans conducted at the group level set and approve by-laws and elect their Management Committee (MC). The MC will have 5 to 7 committee members elected from within the COM Group participants (Tsegaye, 2003).

A diversified membership body of COMSIP protects the financial institution from risk of concentration of loans in a restricted range of economic activities (e.g. trading) as seen now in the focus groups. It also enables the institutions to attract net savers whose liquidity is intermediated to those in need of credit. Thus, lending to micro-business, agribusinesses and other high yielding, non-farm business activities become possible. This strengthens the loan portfolios through diversification and builds member loyalty. As this program is to assist the poor, loans are small and targeted to reach the very smallest businesses, farms, and the very poorest entrepreneurs.

2.3   Community Savings and Investment Cooperative Management

2.3.1 Establishment of Community Savings and Investment Cooperative/Group

The capacity building, entrepreneurial skill development and other training by COMSIP cooperative Union limited are essential to developing the skills of members. This training is conducted parallel to the development of COM Groups and COMSICs. The effective development of COMSICs that serve the targeted poor depends upon the program's ability to identify and convince local community leaders to organize. During the process, much attention is given to the composition of COM Group membership to ensure the effective participation of women as members and leaders (Tsegaye, 2003).

2.4   Community Savings and Investments Cooperative Key Services

2.4.1   Savings Mobilization

This program is developed to make member savings the primary source of funds for lending. To attract more savings, competitive rates of interest are paid on savings and charged on loans. Strict financial disciplines are applied to control costs and reduce risk. Mobilization of savings, in the long run, allows COMSICs to be independent from external sources of financing, eliminate credit rationing, and provide members with a greater selection of savings and loan products (Tsegaye, 2003).

The savings mobilization program uses a systematic pro-poor approach with an aggressive marketing strategy to assist COMSICs in mobilizing savings and increase membership. COMSIC members (savers and borrowers) are required to buy at least one share to be member-owners of the club. Members are encouraged to buy more shares to capitalize the

COMSIC. According to the SACCO experience, members tend to accumulate more money in the form of shares (forced saving) than in the savings or demand deposit (current) account. The total member savings in the SACCO system are about 9% of total shares and savings. In addition to shares, members are offered demand deposit and fixed-term deposit accounts. These shares and deposits constitute the available capital of a COMSIC to render loan services to its members (Tsegaye, 2003).

2.4.2   Savings Protection

As is discussed in this program, the continuation of entrepreneurial skill training to the rural clients increases their income. Once competitive pricing policies and pro-active marketing strategies are put in place, large volumes of savings are mobilized quite rapidly. The challenge then becomes effective protection (security) and the sound investment in safe loans and other investments (Tsegaye, 2003).

The formation of COMSICs is conditional upon the adoption and maintenance of financial management discipline, which protects the members' savings and improves long-term economic viability. These disciplines include audits, standardized accounting, delinquency control, provisions for loan losses, earnings, retained earnings and capital reserves and liquidity reserves. The development and implementation of a risk management is therefore very essential (Tsegaye, 2003).

2.5   Lending and Investment Services

The more savings are accumulated the more capacity for larger loans opens. As members establish history and demonstrated cash flow, they gain access to larger loans based on

their repayment capacity. Prudent lending or investing of members' savings is the key for success and sustainability of any financial institution. Lending is the major service that a COMSIC provides to its members. This essential service is the responsibility of management and a credit committee. The key to lending is having a well-planned lending policy with all the necessary forms and documents (Tsegaye, 2003).

With its community-based membership, COMSICs are able to protect the long-term sustainability of their institution by diversifying the risk of the loan portfolio. COMSICs provide loans to members engaged in many areas of economic activities such as agriculture, dairy farming, trading, light manufacturing, etc. Thus, the failure of several farmers' crops or falling prices does not affect all sources of loan repayment and income. The COMSIC overcomes the crisis and continue to serve its members in future years (Tsegaye, 2003).

2.6   Savings

For COSMICs to be sustainable there must be sufficient savings generated for on lending and investment. Thus, COMSICs are organized with the mobilization of savings as their major service to their members. Such savings are the main source for development of micro-businesses as a basis for income generating activities (Barnet, 2008).

2.7   Loans and Investment

- As the household credit, penetration rates in rural areas are very low and the demand for credit is high, COMSICs' major challenge at the start of the program is to satisfy the credit and investment needs of their members. In addition, due to high

risk in the rural context, loan products development, lending and collection processes, and management capabilities need to be taken into consideration (Barnet, 2008). In such development, the following are considered: Lending principles: member's character is the key to rural lending. In addition, members past debt repayment record and personal behavior are considered.

- **Repayment capacity**: applicants past savings record and cash income are checked.

- **Collateral**: as the poor might not be able to provide tangible assets as collateral, the following mechanisms are considered to establish secondary sources of repayment. There is use of group lending methodology, personal guarantees of members equally qualified and personal shares and savings.

- **Market interest rates**: COMSICs charge market interest rates (prime lending rate plus points that will be decided from time to time) on loans to be competitive and to be able to pay high yield on member savings. Interest on loans must cover the cost of savings, operating costs, loan loss provisions and additions to capital reserves, interest on loans must be calculated on declining balance and loans secured by collateral (in possession of a COMSIC) may have discounted interest rate. Table 2.1 shows the active COMSIP group in Kasungu District since 2004.

Table 2.1: COMSIP Groups in Kasungu

	COMSIP	District	TA
1	Chasato COMSIP Group	Kasungu	Mphomwa
2	Chimwemwe Yobe COMSIP Group	Kasungu	Kaluluma
3	Kapezachi COMSIP Group	Kasungu	Kaluluma
4	Kasiwa COMSIP Group	Kasungu	Mnyanja
5	Tikoleraneko COMSIP Group	Kasungu	Mphomwa
6	Mtende COMSIP Group	Kasungu	Chisemphere
7	Chikondi Business group	Kasungu	Kaluluma
8	Chikula women COMSIP Group	Kasungu	Mnyanja
9	Chitapu Women COMSIP Group	Kasungu	Kaluluma
10	Kadyandiwo COMSIP Group	Kasungu	Chisemphere
11	Kamdidi women COMSIP Group	Kasungu	Kaluluma
12	Kamwalembo women COMSIP Group	Kasungu	Kaluluma
13	Kaviyombo COMSIP Group	Kasungu	Mnyanja
14	kondwani COMSIP Group	Kasungu	Chisemphere
15	Majoka COMSIP Group	Kasungu	Kaluluma
16	Mbiriyawo COMSIP Group	Kasungu	Kaluluma
17	Mkonje COMSIP Group	Kasungu	Chisemphere
18	Penjani COMSIP Group	Kasungu	Kaluluma
19	Tiwonerepo COMSIP Group	Kasungu	Kaluluma

Source: COMSIP Cooperative Union Limited, 2004.

2.8   Empirical Studies

The following studies show how the factors influence households' decision to join groups or cooperatives and how membership to these groups/cooperatives impacted on income and access to credit:

Musopole et al., (2007) found that households are influenced by their desire to access credit and invest in small scale businesses to save money when they decide to join the micro credit groups or cooperatives in Malawi. This is the case because households realize that one of the means through which households can increase their income and therefore alleviate poverty is through access to credit. It is however, very difficult to access credit in Malawi such that the productive capacity of poor households is affected. The very few well to do households get credits at a softer term from formal markets as they are able to provide collateral. That is why most of households join groups or cooperatives to access credit for them to invest and save money since these micro-credit can easily give loans to a group rather than to an individual (Musopole et al., 2007).

Matchaya (2005) studied the impact of rural producer organizations on livelihoods of National Smallholder Farmers' Association of Malawi (NASFAM) farmers. Using an Instrumental Variable (IV) approach, he found that farmers' affiliation to NASFAM had a positive impact on their income per capita. There was also evidence that NASFAM had increased farmers' access to credit and their fertilizer expenditure. The study showed that most households are influenced to join rural producer organizations (grouping) by their need to access credits and buy fertilizers to realize income from sales of farm produce. Briefly, high prices of fertilizers influences household to join micro credit schemes for

them to afford fertilizer. The study found out that membership to NASFAM increased income and credit market participation of farmers by 11% and 46% respectively.

Tretcher (1999) used a logit regression analysis to analyze the factors associated with diversification on agricultural cooperatives. He found that the impact of diversification upon measures of cooperative performance (profitability, patronage refund and equity redemption) was relatively minor, i.e., diversification on agricultural cooperatives was not statistically associated with profitability, increases in patronage dividends or increases in equity devolvement. The result also showed that diversification on agricultural cooperatives was an important factor in determining membership size, i.e., diversified cooperatives enjoyed larger membership.

Asadul Islam (2008), using IV and Propensity Score Matching (PSM), found that the effects of micro-loans are not robust across all groups of poor household borrowers; the poor participants are among those who benefit the most and the effect of participation is, in general, stronger for male borrowers.

CHAPTER 3

METHODOLOGY

3.1   Description of the Study Area

3.1.1   Location

This study was conducted in Kaluluma area in Kasungu District which is located at the approximate latitude of S 13° 0' $0^{"}$ E 33° 25' 0". Kasungu District is located in the Central Region of the Republic of Malawi. The district is bordered by Zambia in the West, Mchinji, Dowa and Lilongwe in the South, Mzimba in the North, Nkhotakota and Ntchisi in the East (see Figure 3.1). The district headquarter is approximately 127 km from Lilongwe, the Capital City of Malawi. The total area of the district is 7, 878 square kilometres making up 8.4% of the total land area of Malawi, which is 94, 276 square kilometres. The study was conducted at village levels where there are COMSIP operations (Bambe, 2006). The district has 19 COMSIP groups actively involved in borrowing, savings and investments through small scale enterprises in Traditional Authorities Kaluluma, Mphomwa, Mnyanja and Chisemphere since 2004 (COMSIP Cooperative Union Limited, 2010). Map of Malawi as well as of Kasungu district showing the study areas, that is, the Traditional Authorities (TAs). Kasungu has an estimated population of 627, 467 according to the 2008 Housing Population Census with an annual growth rate of 2.7 % (National Statistical Office [NSO], 2008).
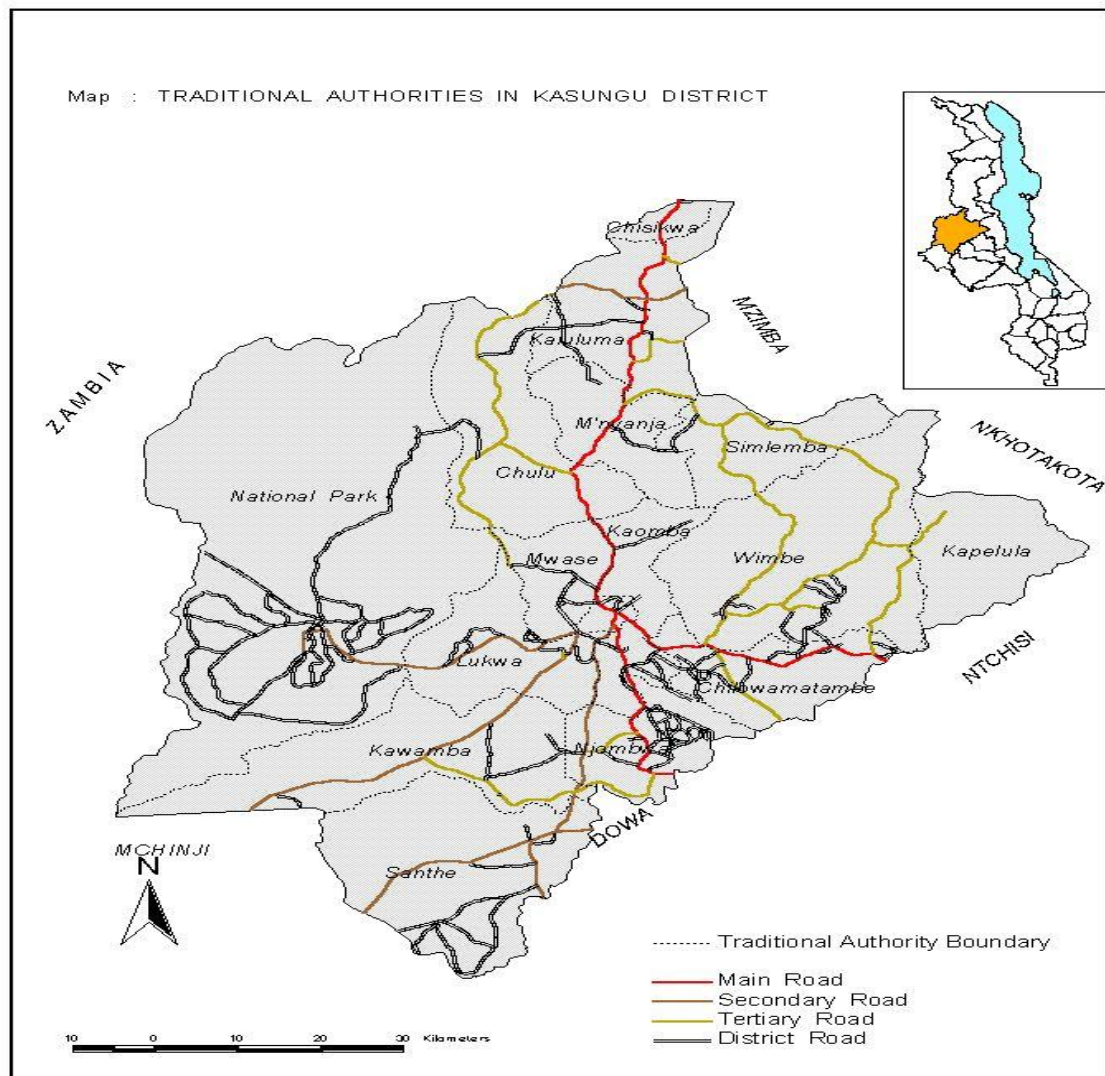
Figure 3.1: Traditional Authorities in Kasungu District

Source: Physical Planning Department, Lilongwe, Malawi, 2006

3.1.2 Livelihoods in the Research Area

The major economic activity in the district is farming, both commercial and subsistence.

Apart from agriculture, there is a commercial and industrial sector including retail services,

small-scale manufacturing, and construction. Food insecurity is one of the major problems faced by the district (Bambe, 2006).

Kasungu has a total farming area of about 550, 400 hectares, which includes a large state sector and the Kasungu Flue-Cured Tobacco Authority (KFCTA). Soils are reasonably fertile and there is much potential for further agricultural development through increasing the yield level of existing crops (maize, groundnuts, tobacco, beans) and for broadening the range of crops grown to include oil seeds. Maize production occupies 70% of the cultivated area followed by groundnuts (12%) and tobacco (3%). Livestock is important although remaining comparatively underdeveloped. Livestock is more numerous in surrounding districts than in Kasungu but has remained relatively underdeveloped (Bambe, 2006).

The district is under the Lilongwe- Kasungu Plain. Topography is generally undulating. It is at a height of 1, 100 metres above sea level. Its landform includes Kasungu Mountain located to the west of the Central Business District (CBD), and Kasungu- Chipala to the north-north east. Kasungu Mountain is 1, 451.1 metres high. The district has slopes ranging between 2º and 5º. The ground generally slopes from the southwest to the northeast (Bambe, 2006).

Savanna Woodland mainly brachystegia woodland with grassland is the most dominant type of vegetation in Kasungu District mostly evident in Kasungu National Park. In some areas, the vegetation is interspersed with montane grassland, which provides habitat for diverse fauna like birds, hares and snakes.

3.2 Sampling Design

The target population of this study was households (smallholder farmers), members and non-members of the COMSIP program. The households included in the study were selected at random in two stages. The first stage involved selecting households from villages earmarked by COMSIP Cooperative Union Limited as potential areas where the programme might be introduced in the near future (COMSIP groups formed in these areas but they have not been targeted by COMSIP activities yet). These acted as areas from which a control group was drawn. The second stage involved randomly sampling households from areas with COMSIP activities. Specifically, the sample included 75 households of individuals participating[2] in COMSIP activities, 38 households of non-members but from villages where COMSIP operated, and finally 37 households from areas where COMSIP does not currently have activities, a control group[3], such non-members to active COMSIP groups with COMSIP activities acted as a comparator. The 38 households where taken on board since the villages where COMSIP operated, there were the only found to be fully actively involved in COMSIP activities and the only found in the records at COMSIP headquarters offices. And to ensure that the sample size is 75, that is why the remaining 37 were the ones taken from where COMSIP does not have activities (control group). This sampling in part ensured that there was not much heterogeneity between the villages hence qualifying them for a better comparison group than if they were located very

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[2] Participation is defined in terms of current membership i.e. actively involved in COMSIP activities at the time of interviews.

[3] Control group is a sample of households from control villages and includes those households whose household heads expressed their willingness to participate in COMSIP program if available (members of non-functional COMSIP groups in case of this study in Kasungu district).

far away. The villages under each of the COMSIP groups understudy were drawn through stratified random sampling. The stratification was based on the presence and absence of COMSIP program.

Some non-program villages were selected among neighbouring program villages. Control villages and program villages were chosen from each of the COMSIP program areas inclusive of non-program villages. In selecting survey households, the universe of households in program villages was drawn from COMSIP member register book grouped according to eligibility status. The household said to be eligible had a landholding size of less than 0.005 hectares. This eligibility rule is set to simply identify the poverty status of the households. The households interviewed in the study were selected into the study using Simple Random Sampling method.

3.3 Data Collection

The research team comprised the researcher and seven enumerators. The researcher trained the enumerators on a number of relevant aspects of the research prior to the interviews. This was meant to help the team on understanding the objectives of the research. A household survey was conducted using a semi-structured questionnaire which was pre-tested. The results of the pre-test helped in the restructuring of the final questionnaire by paraphrasing or rephrasing questions that were unclear to both the respondents and interviewers, incorporating missing variables and omitting irrelevant questions.

Data was collected on socio-economic and demographic characteristics using the pre-tested semi-structured questionnaire. All sample participants and non-participants of COMSIP program were visited and interviewed. Primary data was also collected through key

informant interviews using a checklist of issues. Focus group discussions were employed to capture information based on consensus and to verify the responses from the individual interview. Respondents were placed in groups of 8 − 10 and a checklist of issues was used to facilitate the discussion and notes were taken. The study also made use of observation method which enabled the researcher and the enumerators to validate the household's responses.

Data collected included sources of household income, membership of COMSIP groups, fertilizer access, land holding size and distance between a household's residence and COMSIP local office. Secondary data and other relevant information was collected from bulletins, books, journals, publications from Bunda College of Agriculture library, records from COMSIP Cooperative Union Limited in Lilongwe and others.

3.3.1 Data Limitations

Considering that the time of research coincided with farm tobacco harvesting and selling, it was difficult to find household heads, hence some spouses might have been giving different information. However, conducting the interview in the presence of other household members, like older children, minimized the problem. Collection of income data was difficult since data was based on recall and not records. Households do not keep records of their income inflows and outflows, therefore, income levels used are estimated annual income levels.

3.4 Data Analysis

Data collected were processed using STATA and Microsoft Excel packages. Descriptive statistics, Chi-square Test, Breusch-pagan Test (for Heteroskedasticity), Variance Inflation Factor Test (for Multicollinearity); and Instrumental Variable Analysis and general Probit Analysis were employed to analyze the data.

3.4.1 Identification of Factors influencing Household Decisions to join the COMSIP Groups (Objective 1)

3.4.1.1 Model Specification

General Probit model was used to identify the determinant variables on a household's decision to join a COMSIP group. Models which include a "yes" or "no" type of dependent variable are called dichotomous (binary). Such models approximate the mathematical relationships between explanatory variables and the dependent variable that is always assigned qualitative response. The four most commonly used approaches to estimate dummy dependent variable regression models are: (i) Linear Probability Model (LPM); (ii) Legit Model; (iii) Probit Model; and Tobit Model.

They are applicable in a wide variety of fields (Gujarati, 2004). The Logit and Tobit models will guarantee that the estimated probabilities will lie between logical limit 0 and 1 (Pindyck and Runbinfeld, 1990). Because of this and other facilities, the Logit and the Probit models are the most frequently used models when the dependent variable happens to be dichotomous (Maddala, 1990; Gujarati, 2004).

Ignoring the minor differences between Logit and Probit models, Gujarati (2004), Pindyck and Runbinfeld (1990), pointed out that the two models are quite similar, so they usually

generate predicted probabilities that are almost identical. Aldrich and Nelson (1984) indicated that in practice these models yield estimated choice probabilities that differ by less than 0.02. Besides its difficulty in calculation, the Probit model enables to calculate the marginal effect of the explanatory variables on the dependent variable. Therefore, this study will apply general Probit model.

According to Maddala (2001) general probit model is specified as:

$$I_i^* = \alpha + \delta X_i + \varepsilon_{1_i} \qquad \text{.............. (1)}$$

where:

$I = 1 \; if \; I_i^* > 1,$ COMSIP Group membership;

$I = 0 \; if \; I_i^* \leq 0,$ Otherwise;

X_i are exogenous variables where i=1, 2…, 10;

$X_1 =$ Gender (sex) of a household head (1 = female; 0 = otherwise);

$X_2 =$ Age of household head (years);

$X_3 =$ Educational level of the household head (scores);

$X_4 =$ Consumer-worker ratio;

$X_5 =$ Land per capita (hectares);

$X_6 =$ Income per capita (Malawi Kwacha);

X_7 = Credit per capita (Malawi Kwacha);

X_8 = Tobacco growing (1 = growing tobacco; 0 = otherwise);

X_9 = Distance to the COMSIP cooperative office from the household (Kilometres);

δ is vector of parameters to be estimated;

α is the intercept term;

ε_{1i} are the disturbance terms.

3.4.1.2 Operationalization of Variables

(1) Dependent Variable of the Model

The dependent variable can take the value 1 with a probability of success when a household joined COMSIP cooperative independently, or the value 0 when a given household did not join a COMSIP cooperative to be analyzed using general probit model independently. COMSIP Cooperative membership operationalized as the involvement of a member in a group situation and contribution to goals of the COMSIP cooperative.

More Explicitly:

$\{Yc = 1$ if a given household joins a COMSIP cooperative, 0 otherwise$\}$

(2) Independent Variables

(i) Sex of a household head (X_1)

Women may desire to join the grouping as a buffer mechanism. Joining would probably promise higher expected returns to them relative to an outcome of not joining. It is therefore, hypothesized that sex might take either sign in the membership equation.

(ii) Age of a household head (X_2)

It is hypothesized that age of the household head will take a positive sign in the membership equation but age squared will be negative signifying that as age increases a household may become risk averse and may not join such ventures.

(iii) Education of household head (X_3)

The education level of the farmer is expected to have a positive effect on the decision making process. It is expected that heads of households with more years of education will be able to understand the benefits of membership to a cooperative and they may join it. However, higher education might just imply that they will not rely much on agriculture and they might not join the COMSIP groups. But this might probably not apply here as not many of the sampled families had very high education to generate such a non-linear effect of education. It is expected that education will positively affect credit acquisition and incomes. This is consistent with other studies which have shown that education is a great asset if farming is to be productive. Educated farmers may not find it hard to get credit; they are creditworthy in relative terms.

(iv) Consumer-worker ratio (X_4)

C-W ratio is the ratio of consumers per number of adults capable of working in a household. Consumer worker ratio (C-w ratio) is the household's dependency ratio and it is

hypothesized that the larger it is the poor the household in terms of labour and may need to complement its labour with any benefits from the COMSIP group but it is also possible that households with lower C-W ratios may have enough labour required before one can get any credit. If a household does not have enough labour, it might be illogical to get credit as it might not be able to pay back the loan due to labour constraints which will be reflected in the yield. The sign here is ambiguous. This dependency ratio will, however, have any signs in the income, credit membership equations reflecting the effect of labour in credit decisions and the use of credit acquired in terms of investments in small scale-businesses or other enterprises.

(v) Land per capita (X_5)

Land per capita possessed by the household in hectares has as ambiguous sign in membership equation because above certain hectarage, people with more land may not have as much incentive to join the cooperative as those without enough land. Land will, however, positively affect credit acquisition and income per capita.

(vi) Income per capita (X_6)

Household income sources included selling small-scale trading activities including owning a grocery or salaried jobs, remittances etc. Farmers with more sources of income can afford to purchase chemical fertilizers. Therefore, income is expected to have a negative relationship with membership. Income may also have a negative relationship with credit and fertilizer use but should have a positive effect on income per capita as the latter is the sum of all kinds of incomes.

(vii) Credit per capita (X_7)

Credit acquired before the start of a growing season will have positive effect on the amount of fertilizer use in the following growing season as well as on incomes realized from farming at the end of that farming year. Fertilizer use as well as credit will, therefore, have positive signs in the income equation. Thus, this variable is expected to have a positive sign in membership equation.

(viii) Dummy for tobacco (X_8)

Dtobacco is a dummy variable stating whether a household grows tobacco or not. It is hypothesized that in general households which grow cash crops which require more fertilizer use, are likely to join the cooperative hoping they might get a chance of getting fertilizer credits or any other agricultural resources which would boost their cash crop farming. The sign here should be positive. This variable will have positive signs in the credit, fertilizer use and income equations because a tobacco farmer needs credit to buy fertilizer since fertilizer is a crucial input in tobacco farming. Tobacco production adds to the incomes opportunities of households.

(ix) Distance of the COMSIP Office from the household (X_9)

Distance is from the offices of the COMSIP to the village where the household is located. It is hypothesized that the greater the distance from one's household to the COMSIP offices in Kasungu, the less likely the household would have heard about the importance of COMSIP groups from field officers and hence the less likely they might want to join the club affiliated to COMSIP. The sign for this will therefore be negative.

3.4.2 Determination of the impact of COMSIP on household incomes and access to credit (Objectives 2 and 3)

The Instrumental variables approach was used to identify the impact of COMSIP on household incomes smallholder farmers and household credit market participation. Impact evaluations have used a range of methods, including randomization, matching techniques and IV. Some have relied on several approaches which can provide a useful check on robustness of the assumptions underlying different estimates. In each case, the choice of evaluation methods reflects available data, time and resources as well as the particular focus of the different evaluations.

3.4.2.1 The Notable Impact Evaluations Methods

(i) Randomization

Randomization is immensely appealing because if the sample is large enough, this method controls for all differences, observable and unobservable, between the treatment and control groups. Simple differences in mean outcomes between the two groups, or differences in changes in outcomes, can then be credibly interpreted as the impact of the treatment on the treated. While experiments with random assignment represent the "gold standard" of evaluation design, they are not feasible when seeking to evaluate the impact of an intervention or program.

Indeed, the World Bank notes that "Randomized evaluation designs, involving the collection of information on project and control groups at two or more points in time, provide the most rigorous statistical analysis of project impacts and the contribution of other factors. But in practice, it is rarely possible to use these designs for reasons of cost,

time, methodological or ethical constraints". Fortunately, two other approaches can yield robust evaluations although each requires important assumptions and has its own limitations (Hiscox et al., 2008).

(ii) Matching Techniques

Propensity Score Matching in its simplest form involves predicting the probability of treatment on the basis of observed covariates for both the treatment and the control group samples. This probability, the propensity score, is then used to match treated and untreated observations, e.g., through nearest neighbour matching. Propensity score matching is often simple to carry out.

However, Propensity Score Matching requires an exhaustive questionnaire to accurately match treated and untreated populations based on their observable characteristics. It demands careful consideration of the extent to which unobservable differences remain between the two samples. This is the drawback which includes the need to understand a wide array of factors that encourage participation and the need to access data on those factors in the year(s) of participation for both participants and non-participants. Furthermore, matching methods require the assumption that besides those used by the researchers to create the matched groups, all other factors are randomly distributed across both the participants and matched non-participants (Rawlings and Schady, 2002).

(iii) Instrumental Variables

Two-Stage Least Squares estimation attempts to mimic an experimental design. It relies on a variable, the instrument, which is assumed correlated with the probability of treatment

but uncorrelated with unobserved determinants of outcomes. Under these circumstances instrumental variables can purge the estimation of treatment effects of such problems as measurement error, reverse causality, or non-random program placement (Rawlings and Schady, 2002).

The major strength of the IV method is the fact of exploiting situations that are similar to a randomized experiment. Moreover, the use of research – generated instrument is growing and reflects the accelerating convergence of classical experimentation and observational research methods. The most important development is the use of instrumental variables in randomized experiments. Instrumental Variables are useful in experiment when, either because of practical or ethical considerations, there is incomplete compliance in treatment or control groups. As in natural experiments, the instrument is used to exploit on exogenous source of variation – created by explicit random assignment in these cases – to estimate the effect of interest. Similarly, in medical trials, doctors may be willing randomly to offer, but not to impose, incentives that change behaviours like smoking or taking medication (Rawlings and Schady, 2002).

In an IV setting, a variable should be found which is highly correlated with the treatment but not with the error term or the other explanatory variables, i.e. *Cov (z, D_i) $\neq$ 0, cov (z_i x_i) =0, cov (z_i u) =0* where *u* is an error term (Wooldridge, 2002) where D_i is as defined above and *z* is a vector of instruments.

A challenge here is getting a good IV or at least generating one. As noted by other researchers, if an instrument *z* is a valid instrument, then the set of controls in a model is adequate. If *z* is not valid then the set of controls is not enough. Due to this, instrumental

variables are not inherently better or more plausible than regression strategies since finding a valid instrument is equivalent to, and hence in general no more plausible than finding an adequate set of controls (Cobb-Clark and Crossley 2003). While this might be the case, Wooldridge (2003) showed that an IV can consistently estimate the population average treatment effects under weaker assumptions than those needed for two stage least squares plug-in estimators proposed by Heckman (1998). Blundell and Dias (2002) also indicated that given cross-sectional data, IVs can be a reliable tool for evaluating program impacts as long as it satisfies the required assumptions. Under the required assumptions an IV provides the required randomness in the assignment rule. Thus the relationship between the instrument and the outcome for different participation groups identifies the impact of treatment avoiding selection problems. Selection problems arise because one decision to join a cooperative may be determined by other factors, for example, education. It is then possible that members of a cooperative could have higher incomes just because they are well educated and hence higher education influences their incomes positively. In this case, to compare incomes of people outside and inside the cooperative, there is need to find out about all variables influencing the decision to join the cooperative in order to estimate the outcome equation jointly with the equation to join the cooperative. Since it is impossible to know all the variables to that extent, there is need to find an instrument or a good proxy for it. In this case Wooldridge (2002) argues that a better proxy is found by instrumenting the dummy endogenous variable (the decision to join a cooperative) with a propensity score obtained by running a probit model on the decision to join as a function of other regressors including at least one variable that will not be used to compute the outcome in the impact equation (e.g. income, credit etc). Here the decision to join cooperatives is thought to

include several variables. The propensity score (the instrument) is obtained by running probit on z in equations below. The propensity scores are then used as an instrument in Y_i (outcome equations)[4].

Estimation of cooperative membership impacts on the amount of credit acquired might be conceptualized as follows:

$$y_1 = \beta_1 x + d_1 z_{cooperative} + e_1 \quad \text{(amount of credit equation)}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

$$z = \beta_1 w + e_2 \quad \text{(decision to join cooperative equation)} \ldots\ldots\ldots\ldots\ldots.. (3)$$

In the event that error terms e_1 and e_2 are correlated OLS estimation is inconsistent. y_1 is the logarithm of credit acquired; z is a membership dummy while x contains variables that influence a household to join COMSIP cooperatives.

For the income problem we can write

$$y_2 = \beta_1 x + d_1 z_{cooperative} + e_2 \quad \text{(income equation)}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (4)$$

where y_2 logarithm of income per capita while z is a dummy for membership into the cooperative and x contains variables that influences a household to join COMSIP cooperatives.

3.4.2.2 Model Specification

To test the hypotheses, this research will use an instrumental variable approach on models 2-4 whose theory has been discussed above and whose variables are discussed below.

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[4] For extensive discussion about generated instrument see (Wooldridge 2002).

$$Member = \beta_{1,1} + \beta_{1,2}age + \beta_{1,3}agesquare + \beta_{1,4}sex + \ldots + e_1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

$$Income = \beta_{2,1} + \beta_{2,2}age + \beta_{2,3}agesquare + \beta_{2,4}sex + \ldots + \beta_{ij}member + e_2 \ldots\ldots\ldots\ldots ..(6)$$

$$Credit = \beta_{3,1} + \beta_{3,2}age + \beta_{3,3}agesquare + \beta_{3,4}sex + \ldots + \beta_{ij}member + e_3 \ldots\ldots\ldots\ldots.. (7)$$

In above models β_{ij} are impact parameters while member is a dummy variable taking value of 1 if one becomes a member of cooperative and 0 otherwise; income captures the household's per capita income, credit and these are in logarithms. The models will include Dtobacco as dummy equalling to 1 if household grows tobacco and 0 otherwise; and consumer worker ratio, i.e., ratio of consumers per number of adults capable of working in household. The rest to include in the model will be household characteristics e.g. age, sex, education etc as presented in the Table 3.1:

Table 3.1: Summary of Expected Signs of Variables

Variables	Symbol	Membership	Income	Credit
Membership			+	+
Sex of household head	X_1	+	+	+
Age of household head	X_2	+	+	+
Education level of household head	X_3	+	+	+
Consumer – worker ratio	X_4	-/+	-/+	-/+
Land per capita	X_5	-/+	+	+
Income per capita	X_6	+		+
Credit per capita	X_7	+	+	
Dummy for tobacco	X_8	+	+	+
Distance to COMSIP offices	X_9	-		

CHAPTER 4

SOCIO-ECONOMIC CHARACTERISTICS OF COMSIP MEMBERS AND

NON-MEMBERS

4.1   Sex of Household Head

Figure 4.1, shows that 32% of the female-headed households were non-members while 68% were member households. There was 67% of male-headed and 33% of male-headed households who were non-members and members respectively. This entails that 47% of the total number of household heads interviewed were females and 53% were male household heads. These findings indicate that the majority of female-headed households the study area were COMSIP members; whereas the majority of male-headed households were non-COMSIP members.
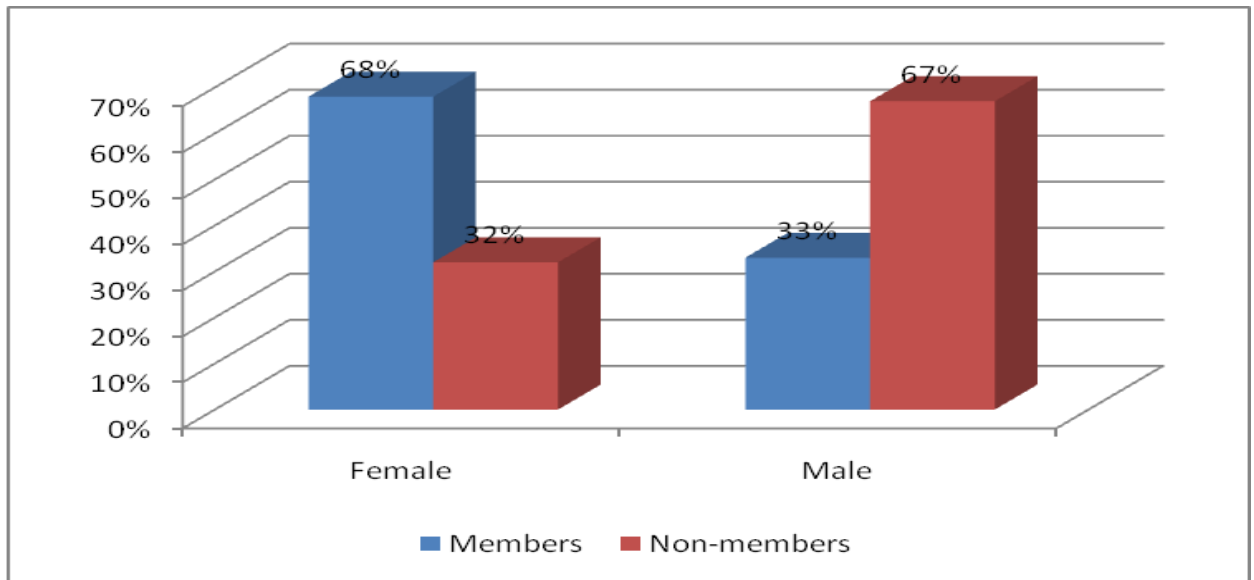
Figure 4.1: Percentage of Households by Sex of Household Head and COMSIP
              Membership

Using the Chi-square test, the proportions of the female and male members of COMSIP groups are significantly different at 5% level of significance (refer to appendix A.1 for Chi-Square test)

4.2   Dummy Tobacco Growing

About 56% and 44% of total non-tobacco growers as non-members and members of COMSIP groups respectively. Moreover, 54% and 46 % of total tobacco growers were members and non-members of COMSIP groups respectively (Figure 4.2).
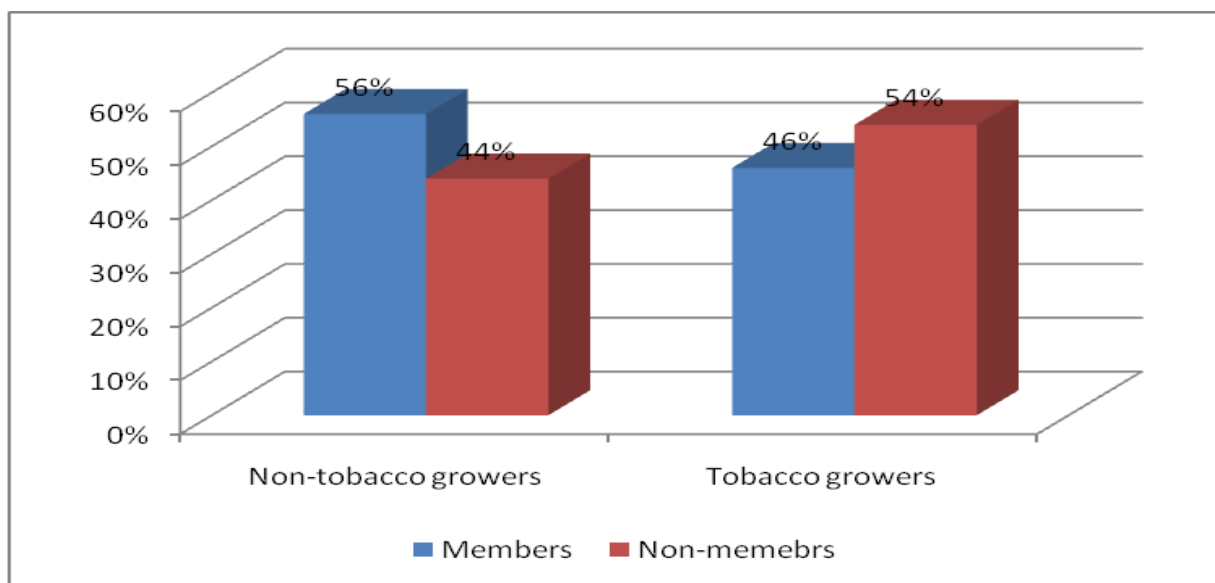
Figure 4.2: Percentage of Households by Tobacco growing and COMSIP Membership

Using the Chi-square test, the proportions of the tobacco growers and non-tobacco growers who are members of COMSIP groups are not significantly different at 5% level of significance (refer to appendix B.1, for Chi-Square test).

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4.3   Means and Standard Deviations of Variables of Concern

The average household income for members[5] to COMSIP cooperative/group was greater than that of non-members. The average per capita income for members to COMSIP cooperatives/groups was MK176, 310.16 or US$1,159.94 per annum with standard deviation of MK2.03 or US$0.01, at current exchange rates of study period (Table 4.1). The average per capita income for respondents who were not members to COMSIP cooperative/group was MK144, 350.55 or US$949.67 per annum with standard deviation of MK1.77 or US$0.01, at current exchange rates of the study period. The credit per capita was MK13, 904.95 or US$91.48 also greater for members than for non-members who had MK4.10 or US$0.03 with standard deviations of MK1.60 or US$0.01, and MK38.47 or US$0.25 respectively. The dependency ratios (C-w ratio) and education levels were on average greater for members than for non-members. However, distance of a household home to COMSIP offices was greater for non-members, about 1.75 Km and for members about 1.46 Km. This reveals that most of members to COMSIP cooperatives/groups are those households who stay near the COMSIP offices having COMSIP activities' awareness, which compels them to join the COMSIP cooperatives/groups as compared to non-members. It can also be explained that both members and non-members have the same characteristics in terms of education since all are in the range standard 7 to 8 (3 scores). It further, means that most of members and non-members of COMSIP group had reached standard 7 to 8.

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[5] Member is a member of COMSIP group and participates actively in the COMSIP such as acquiring credit and investing in entrepreneurship activities the COMSIP program raise the household income.

Using the Chi-Square test, the continuous variables for members and non-members of COMSIP groups are significantly different from one another at 5% level of significance (refer to Appendix C.2 for Chi-Square test).

Table 4.1: Comparison of Socio-economic Characteristics of COMSIP Members and Non-members

Variable[a]	Members	Non-members	Total
Education (scores)	3.28	2.78	3.03
	$(1.34)^b$	(1.23)	(1.31)
C-W ratio	2.35	2.42	2.39
	(0.96)	(0.93)	(0.94)
Income per capita (MK)	176, 310.16	144, 350.55	159, 532.03
	(2.03)	(1.77)	(1.92)
Credit per capita (MK)	13, 904.95	4.10	225.88
	(1.60)	(38.47)	(126.47)
Land per capita (hectares)	0.64	0.77	0.70
	(1.49)	(1.65)	(1.58)
Distance to COMSIP (Km)	1.46	1.75	1.60
	(1.28)	(1.22)	(1.27)

a. Education is a score variable (standards 1-3 =1; 4-6=2; 7-8=3; forms 1-2=4 and forms 3-4=5; C-W ratio is the number of consumers per worker in a household; income per capita and credit per capita are in natural logarithms; land per capita is in acres and transformed into logarithms; and distance is in Kilometres and it is transformed into logarithms.

b. figures in parentheses are standard deviation, the other ones are means

Hint*: Income per capita, Credit per capita, land per capita and Distance displayed in logarithms in appendix 3, Table 9, all has been transformed to antilogs as displayed in Table 4.1.*

4.4 Descriptive Statistics of Various Variables by Household Membership

4.4.1 Primary Occupation of Households by Membership

Most of non-members of COMSIP groups in the study area (87%) were smallholder farmers. Very few members of COMSIP groups (36%) were smallholder farmers. None of the non-member households of COMSIP groups were employed but only 28% of members was employed. However, a higher proportion of COMSIP member households (32%) were engaged in small-scale businesses while none of the non-member households was doing small-scale businesses (Figure 4.3).
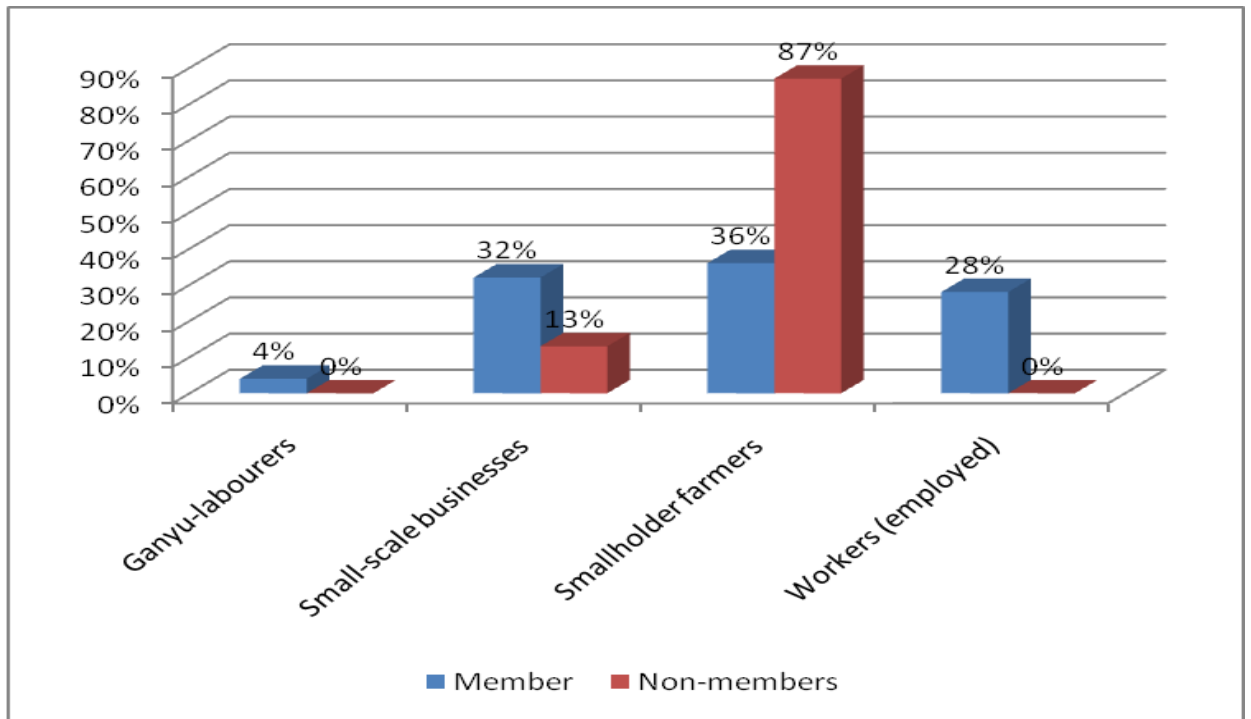
Figure 4.3: Percentages of Households by Primary Occupation and Membership

4.4.2 Major Sources of Household Income by Membership

Major sources of household income for most of member households of COMSIP groups were (in descending order): livestock sales; small-scale businesses and tobacco sales which account for 40%, 30% and 26% of the member households respectively (Figure 4.4). As evidenced by the findings from Focus Group Discussions, most of member households of COMSIP groups engage in COMSIP entrepreneurship activities such as rearing of small livestock for sale and small-scale businesses to increase their household income through credits they obtain from COMSIP groups. This implies that member households use some of acquired COMSIP credits to buy fertilizer. This enables them to grow tobacco they

usually sell to realize household income. This is evidenced in Figure 4.5 that most of the member households, access fertilizer through income realized from COMSIP credits, that is, 38% of member households as shown.

However, Figure 4.4, shows that the major sources of household income for most of 75 non-member households of COMSIP groups are: 28% of non-member households through small scale businesses other than COMSIP; 24% of non-member households through tobacco sales; 18% of non-member households through pension; 10% of non-member households through ganyu-labourers; and very few non-member have their major sources of income through wages (2%), pension (2%), fishing (8%), and livestock sales (8%). This implies that most of the non-member households do not engage much in entrepreneurship activities compared to member households of COMSIP groups.
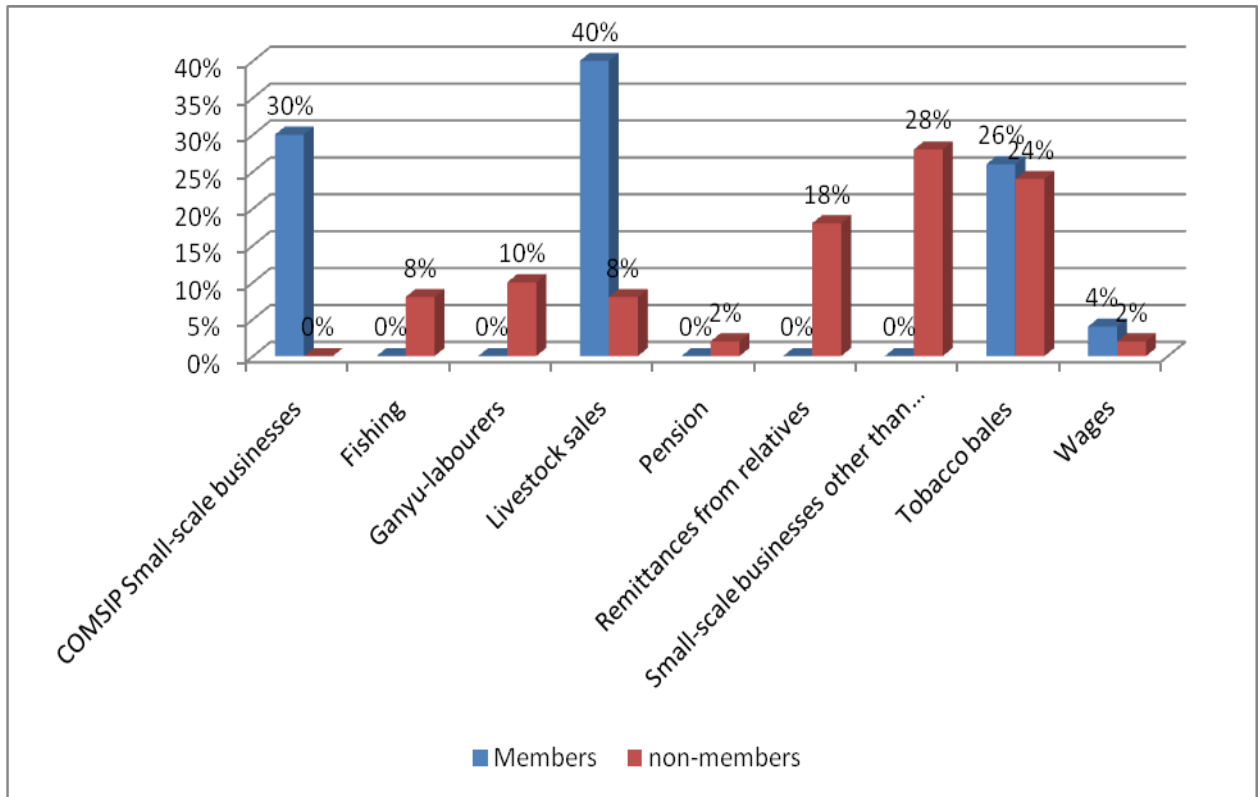
Figure 4.4: Percentage of Households by Main Income Sources and Membership

4.4.3 Households' Access to Fertilizer by COMSIP Membership

Most of the member households have fertilizer access mainly through income realized from COMSIP activities (38% of member households) and through COMSIP credit (34% of the member households. 24% of member households, access fertilizer through Government Fertilizer Subsidy programme. Very few member households of COMSIP groups access fertilizers through Alliance One loan fertilizer loan arrangement (4%) (Figure 4.5).

However, there are no member households of COMSIP groups who do access benefit fertilizers through NASFAM fertilizer loan arrangement (0%) and other institutions other than COMSIP groups (0%).

As evidenced from the figure 5, most of non-member households of COMSIP groups that access fertilizers through Government Fertilizer Subsidy programme (28% of non-member households); 26% of non-member households through Alliance One fertilizer loan arrangement; and 26% of non-member households through other institutions other than COMSIP.

In general, most of the 75 member households of COMSIP groups access fertilizers through COMSIP related activities and some also through Government Fertilizer Subsidy programme. Most of the 75 non-member households of COMSIP groups access fertilizers through other institutions other than COMSIP and some through the Government Fertilizer Subsidy programme.

This implies that a household member of COMSIP group benefits more in terms of increasing household income compared to a non-member This is evidenced in Table 5.2 showing that COMSIP member coefficient increases income per capita by 88%.
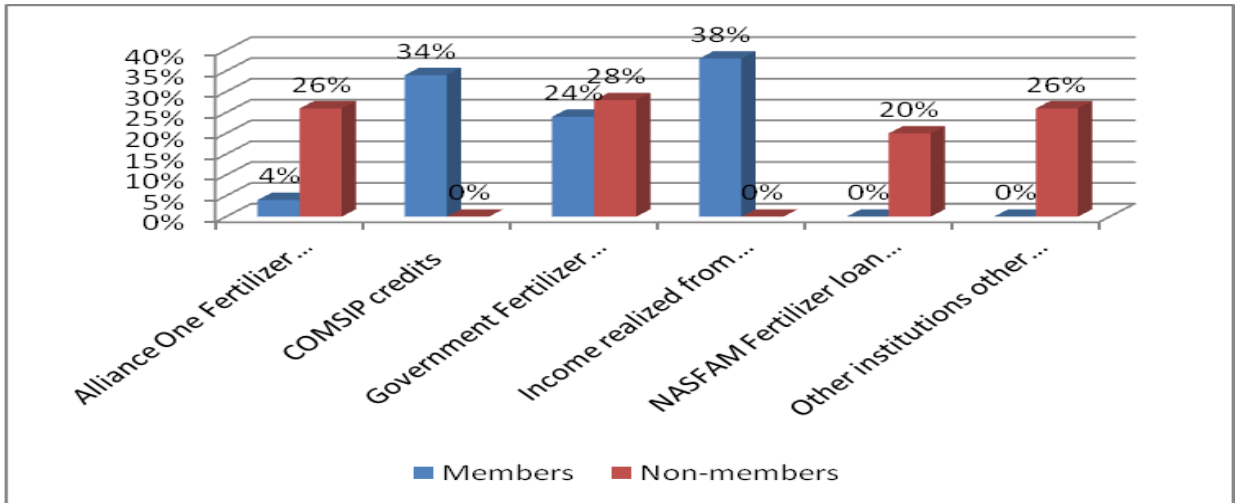
Figure 4.5: Percentage of Households by Fertilizer Access and Membership

4.4.4 Distance of Households from COMSIP Office by Membership

Figure 4.6 shows that most of the 75 member households of COMSIP groups stay near COMSIP offices as follows: 62% of member households stay within a range of 1.5-3Km from COMSIP office; 38% of member households stay within a range of 0-1Km away from COMSIP office.

However, most of the 75 non-member households of COMSIP groups stay far away from COMSIP office as compared to member households of COMSIP groups as follows: about 48% of non-member households stay within a range of 3.5-5Km away from COMSIP office; 28% of non-member households stay within a range of 5.5-8Km away from COMSIP office; 22% of non-member households stay within a range of 1.5-3Km from COMSIP office and very few about 2% of non-member households stays within a range of 0-1Km away from COMSIP office.

This implies that the shorter the distance a household stays away from COMSIP office, the higher the probability for a household to join a COMSIP group as evidenced in table 4 that dummy distance is greatly significantly related to membership at 5% level of significance. And those non-member households are located within the COMSIP program villages and eligible to join the COMSIP group but currently not in any COMSIP groups.

This also implies that awareness of COMSIP activities among the rural people (who most of which are ignorant of the COMSIP program's benefits) is very crucial in terms of attracting rural poor people to join the COMSIP groups for their benefits.
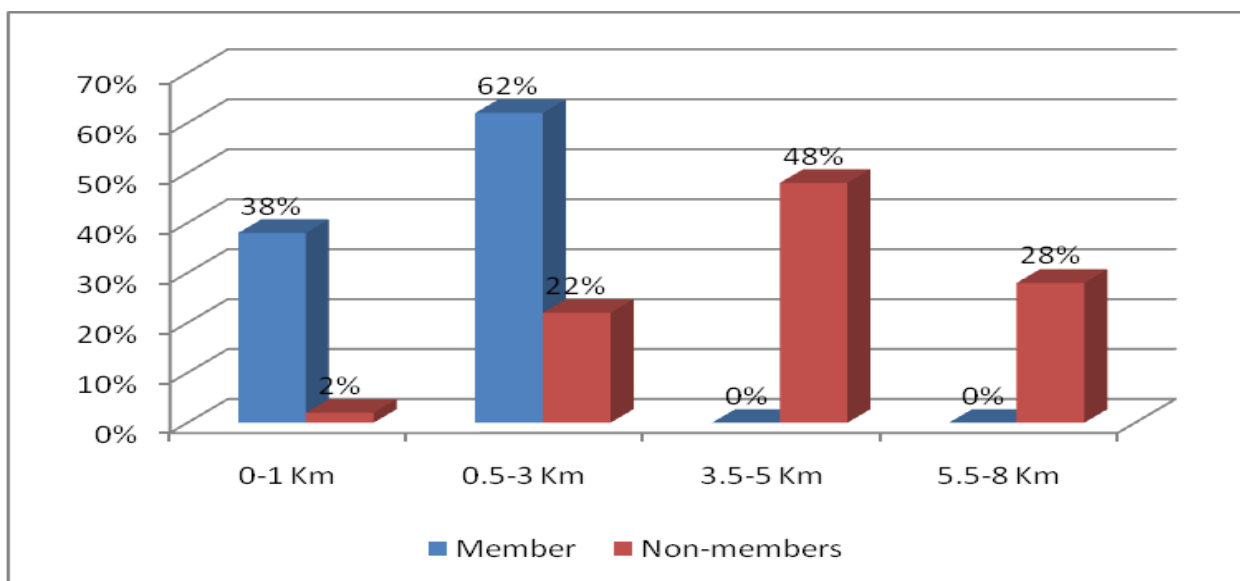
Figure 4.6: Percentage of Households by Distances away from COMSIP Office and Membership

4.4.5 Factors that influence Households to Join COMSIP Groups

Households make decisions about whether to join COMSIP groups or not as part of trying to find out the overall strategy for ensuring improved incomes and credit. In the study, as

the result shows in Figure 4.7, the following factors influence member households' decisions to join COMSIP groups: 22% of member households joined COMSIP groups because of its entrepreneurship activities it offers to members; 20% of member households joined COMSIP groups to access credit; 16% of member households joined COMSIP groups because they lack working capital to start small scale businesses; 12% of member households joined COMSIP groups because they are aware that its entrepreneurship activities can benefit them; 7% of member households joined COMSIP groups to save money and because of high prices of fertilizers so they would like to access credit to afford fertilizers etc.

However, it is evident in the results presented in Figure 4.7 that most of the member households joined COMSIP groups because of its entrepreneurship activities and for them to access credit. Thus, these are among the most influencing factors of households' decisions to join COMSIP groups.
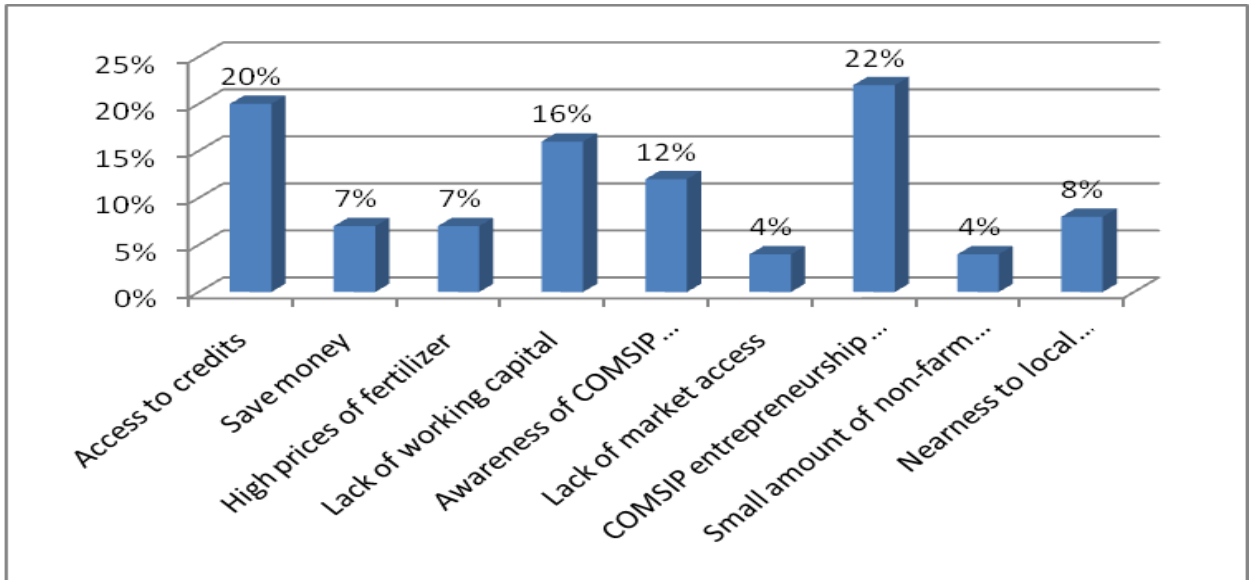
Figure 4.7: Percentage of Member Households by Factors Influencing Households to Join

COMSIP

CHAPTER 5

IMPACT OF COMSIP ON HOUSEHOLD INCOME AND CREDIT

5.1   Factors Influencing Household Decision to Join COMSIP Group: General Probit Analysis

Probit analysis focuses on the dummy for membership to COMSIP cooperatives/groups or not. The results presented are from Probit analysis of the decision to become a member and the propensity scores, which are then used as an instrument for membership in the Instrumental Variable analysis. This variable instrumenting helps to reduce endogeneity (selection bias) which might be encountered when evaluating the impact of membership on outcome variables e.g. income, credit. The endogeneity comes because it is possible that members in COMSIP cooperatives/groups are well off because the programme has infinity for well-to-do people.

It is evident in the results presented in Figure 4.7 that most of the households join COMSIP groups because of being influenced by its entrepreneurship activities and to access credits in search of the strategies for ensuring improved incomes and credits. However, one of the basic hypotheses of this study was that since there are many socio-economic, demographic and institutional variables that can influence households' decisions to join COMSIP groups, the study used the Probit Analysis to test this by checking whether these variables were significant in the model whose dependent variable was 'membership[6]'. Table 5.1 presents results of the analysis:

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[6] Membership is the membership of a household and 1=if a given household joins COMSIP group and 0 otherwise.

5.1.1 Sex of household head (X_1)

The coefficient for variable sex has a positive sign. This is consistent with theory and implies that the COMSIP groups attract females more than males. Table 5.1 shows that sex has significant influence on households' decision to join a COMSIP group at 5% level of significance. Thus, the sex of a household head determines the decision to join the COMSIP group. The results also show that COMSIP attracts more women than men. This agrees with the findings by Doss and Morris 2001. Studies have shown that gender (sex) plays a role in decision making when it comes to the adoption of technologies (Doss and Morris, 2001; Adesina et. Al., 2001). Generally, in sub-Saharan Africa, women have greater difficulty than men in obtaining labour needed for land preparation activities (Doss and Morris, 2001). But women may also desire to join the grouping as a buffer mechanism. Joining would probably promote higher expected returns to them relative to an outcome of not joining.

5.1.2 Age of household head (X_2)

The coefficient for variable age of household head is positive. This is theory consistent in terms of the signs. This means there is a tendency for older farmers joining COMSIP although the variable is insignificant at 5% level of significance. Thus, the age of household head does not determine the decision to join the COMSIP group. However, the COMSIP groups attract membership regardless of age. Any persons of any age is free to join the COMSIP groups provided he/she is able to engage into business entrepreneurship and be able to engage actively into all COMSIP activities as well as abiding by the rules and regulations of the group (Table 5.1).

5.1.3   Education level of household head (X_3)

The coefficient for variable education is negative. This is inconsistent with theory. Education is expected to have a positive sign because household heads with more years of education will be able to understand the benefits of membership to a group and they may join it. It is also possible that higher education might just imply that they will not rely much on agriculture and they might not join the groups.

However, the theory is not applicable in COMSIP program. Education has nothing to do with membership to COMSIP program. For a person to be a member of COMSIP group, education is not a key factor for eligibility. Eligibility criterion for a person to join COMSIP program is based on poverty status of the household mainly those with land of less than 0.5 acres. The program targets the poor people and normally most of the poor people are not educated. The members of COMSIP groups only need training in entrepreneurship skills for them to use the loans efficiently and COMSIP Cooperative Union limited as a requirement for a COMSIP group to be given funds usually does the training. Most of the members of COMSIP groups or all members of COMSIP groups just know how to read and write. Education is not a criterion to join COMSIP groups.

From the results in Table 5.1, education is not significantly related to COMSIP membership implying that years of education a household has; do not determine the decision to join the COMSIP group.

5.1.4   Consumer-worker ratio (X_4)

Table 5.1 shows that the coefficient for variable C-w ratio is positive. However, the sign for C-w ratio is ambiguous, meaning it can take either signs. C-w ratio is the household's dependency ratio and it is expected that sometimes the larger it is, the poor the household in terms of meeting the basic needs of the household. In this case, a household head joins COMSIP groups to meet these basic needs.

In other case, a household with larger efficient labour will easily make a decision to join COMSIP groups to access credits and buy fertilizers for growing cash crops like Tobacco in Kasungu district (study area), and realize a lot of income for a household. Kasungu is one of the main Tobacco growing areas in Malawi.

5.1.5   Land per capita (X_5)

The coefficient for land per capita is negative. This supports the eligibility criterion of COMSIP cooperative groups that for a household to join a group, should posses a land of less than 0.5 acres. This is an indication of a household being in high poverty levels. This is consistent with theory. The logarithm of land area possessed by the household in acres has an ambiguous sign in membership equation because above certain acreage, people with more land may not have as much incentive to join the COMSIP group as those without enough land.

The eligibility rule is set to simply identify the poverty status of the household. In selecting the survey household, the universe of households in program villages, drawn from the census, was grouped according to their eligibility status. A household is said to be eligible if it owns 50 decimals (half-acre) or less of cultivated land. Table 5.1 shows that land per

capita is significantly related to COMSIP membership at 1% level of significance. Land per capita determines household decisions to join COMSIP groups.

5.1.6 Credit per capita (X_7)

The coefficients for variable credit per capita are positive and consistent with theory because these variables can take either sign in the membership equation. The variable is significantly related to membership at 1% level of significance. This might mean that households with higher credit per capita have higher probability of joining COMSIP groups than those with low credit per capita. This implies that these households with higher credit per capita are in a position to use their resources to invest in COMSIP entrepreneurship activities. They will use the business management skills that will be gained from COMSIP to use their resources they have effectively. Thus, credit per capita determines household decisions to join COMSIP groups (Table 5.1).

5.1.7 Dtobacco (X_8)

Dtobacco is dummy variable stating whether a household grows tobacco or not. The coefficient for variable Dtobacco is positive, and this is consistent with theory. In general, households who grow cash crops which require more fertilizer are likely to join the COMSIP group hoping they might get a chance of getting fertilizer credits or any other agricultural resources which would boost their cash crop farming. And this variable will have positive signs in the membership, credit and income equations because a tobacco farmer needs credits to buy fertilizer since fertilizer is crucial input in tobacco farming. However, Dtobacco is not significant, thus the variable does not determine household decisions to join COMSIP groups (Table 5.1).

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5.1.8 Distance of a Household Head to COMSIP Office (X_9)

The coefficient for distance variable is negative. This is theory consistent implying that the greater the distance from one's household to the COMSIP office in Kasungu, the less likely the household would have heard about the importance of COMSIP groups and hence the less likely they might want to join the COMSIP group. Table 5.1 shows that distance is significantly related to COMSIP membership at 1% level of significance, thus distance of household head to COMSIP office determines household decisions to join COMSIP groups.

Probit analysis results show that sex of household head ($p < 0.05$), credit per capita ($p < 0.01$), land per capita ($p < 0.01$) and distance ($p < 0.05$) determines household decision to join the COMSIP groups. The results also show that COMSIP groups attract females more than males. The results show that age of household head, education of household head, consumer-worker ratio and tobacco growing; do not determine household decision to join COMSIP groups. Thus the eligibility (land holding size of less than 0.5 acres and program placement in terms of distance a household stays away from COMSIP office) are significantly related to the participation at 1% and 5% levels of significance respectively.

Table 5.1: Membership Equation

Member	Coefficient[b]	Robust Standard Error	P-value
Sex of head (x_1)	0.7268268**	0.3233712	0.025
Age of head (x_2)	0.0181341	0.0236711	0.444
Education (x_3)	-0.0367467	0.1896976	0.846
C-w ratio (x_4)	0.1822057	0.177028	0.303
Land per capita (x_5)	-5.059743***	1.287645	0.000
Credit per capita (x_7)	0.5729249***	0.0667331	0.000
Dtobacco (x_8)	0.4447204	0.3629855	0.221
Distance (x_9)	-1.318719**	0.5108672	0.010
_cons	-2.44251	1.716812	0.155

a. Wald chi2 (7) = 33.39, Prob > chi2 = 0.000, R^2=0.69

b. *Significance levels:* *10%, **5%, ***1%.

5.2   Impact of COMSIP on Household Income per Capita and Credit per Capita: Instrumental Variable Analysis

5.2.1   Validity of Instruments

Identification requires that land ownership and distance (location of Household from COMSIP office) are exogenous conditional on program participation. The validity of the land-based eligibility and location (distance of household from COMSIP office) based program placement as instruments are justified by post-estimation tests of IV 2sls in both income and credit equations on second stage regressions summaries in appendices E.2 and E.4 respectively. The results in the afore-mentioned regressions summaries test joint significance of all instruments. In both IV 2sls post-estimation for income and credit equations on second stage regressions summaries, for income equation, J-statistic (overidentification test of all instruments) has P-value of 0.67 bigger than 5% significance level, then instruments are exogenous. For credit equation, J-statistic (overidentification test of all instruments) has P-value of 0.08 bigger than 5% significance level, thus instruments are exogenous. Thus, the instruments used in the models are valid, consequently adequate set of controls in the models.

There is no evidence that households endogenously sort themselves out in response to the half-acre eligibility rule. Since credit is expected mainly for non-agricultural purposes (self-employed activities), households having more land are exogenously ruled out. However, there are some participating households that own more than half an acre of land. These might not actively engage in agriculture or land is not fertile for cultivation, or sometimes there is mistargeting, as perfect monitoring is not possible. The eligibility rule

is set to simply identify the poverty status of the household. Note that, in general, richer households get credits at a softer term from formal markets, or through other means. Also there are social norms that bar them from becoming members of a microcredit institution. Rich people in rural areas still hesitate to become members of COMSIP groups because they consider COMSIP groups an institution for the poor. Thus, the use of program eligibility criterion as instrument for treatment in microcredit institution is well justified here.

5.2.2   Impact of COMSIP on Household Income per Capita

The basic hypothesis was that since COMSIP group engages households in entrepreneurship activities that might be considered as increasing household income per capita, its members should be well placed (at least compared to those outside it). They should be in a position to have, on average, higher incomes than non-members of similar household characteristics. Table 5.2 below presents Instrumental Variable estimates for income per capita equation.

Table 5.2: Income Equation

Income per capita	Coefficients[b]	Robust Standard Error	P-value
Membership	0.8775618**	0.3607352	0.015
Age of head (x_2)	0.0089189	0.0069719	0.201
C-w ratio (x_4)	0.0196636	0.0123049	0.110
Dtobacco (x_8)	-0.0673405	0.1174242	0.566
Education of head (x_3)	-0.0323876	0.0399994	0.418
Credit per capita (x_7)	1.411582**	0.6000983	0.019
_cons	11.29569***	0.4498929	0.000

a. F (7, 142) = 1.32, Uncentered R^2 = 0.99, MSE = 0.70

b. *Significance levels: * 10%, ** 5%, *** 1%.*

5.2.2.1 Membership to COMSIP groups

Table 5.2 shows that membership to COMSIP group is the main determinant of income per capita and significant at 5% level of significance. COMSIP membership, variable of concern, seems to influence household income per capita positively. Its coefficient shows that membership increases per capita income by 88%. Thus, membership is quite good for incomes.

5.2.2.2 Age of household head (X_2)

The coefficient for variable age is positive. This is consistent with theory. Age is expected to be positive in the income equation because as age increases one's asset holding might increase. This in turn may act as collateral in other credit sources. Income sources may also increase with age as one's children become sources of remittances etc. The non-linear part of age captures the fact that there is limit to which the effect of age on the discussed variables can be positive. There is no reason for very old people to engage in massive farming for example. However, Table 5.2 shows that age is not significantly related to income at 5% level of significance. It is not a determinant of income per capita.

5.2.2.3 Education of household head (X_3)

The coefficient for variable education of head is negative. This is inconsistent with theory. Education variable is expected to be positive in income equation because education positively impact on incomes. This is consistent with other studies, which have shown that education is a great asset if farming is to be productive. Educated farmers may not find it hard to get credit.

Education level of household head in COMSIP program does not affect income per capita of household. What matters in COMSIP groups for income per capita to be affected is to undergo entrepreneurship trainings and engage in small-scale businesses to realize incomes consequently increasing the income per capita of household head. Education level of a household head can just facilitate acquisition of entrepreneurship skills but not actually affecting the income per capita of a particular household head. In the results of Table 5.2, this justifies the reason why education variable is not consistent with theory in income

equation and even not a determinant in increasing income levels for members of COMSIP groups, particularly in the COMSIP program per se.

5.2.2.4 Consumer-worker Ratio (X_4)

The coefficient for variable C-w ratio positive and this is consistent with theory since C-w ratio variable can take any sign in income equation implying that the higher the dependency ratio, the higher the per capita income. A household with larger efficient labour will easily make a decision to get credit, buy fertilizers for growing cash crops like Tobacco in Kasungu district (study area), and realize a lot of income for a household. Kasungu is one of the main Tobacco growing areas in Malawi. However, this variable is not significant (Table 5.2).

5.2.2.5 Credit per capita (X_7)

The credit per capita variable is positive and this consistent with theory because Credit per capita is supposed to be positive in income equation. Credit acquired before the start of a growing season will impact positively on the amount of fertilizer use in the following growing season as well as on incomes realized from farming at the end of that farming year. In the results of Table 5.2, this justifies the reason why credit variable is consistent with theory in income equation and a determinant in increasing income levels for members of COMSIP groups at 5% level of significance.

5.2.2.6 Dtobacco (X_8)

The coefficients for variable Dtobacco have negative sign implying that tobacco growing by farmers who has joined COMSIP activities reduces per capita income. This is inconsistent with theory. These variables are expected to have positive sign in income equation.

COMSIP would like members to engage in small-scale businesses, entrepreneurship activities. COMSIP discourages members to use credits they access to buy fertilizers and grow tobacco because of high risk involved in tobacco growing including poor market prices and also tobacco takes longer time to realize incomes for farmers to lend to other farmers as a revolving fund in a COMSIP group.

In the results of Table 5.2, this justifies the reason why Tobacco is not consistent with theory in income equation and even not a determinant in increasing income levels for members of COMSIP groups, particularly in the COMSIP program per se.

The IV model for income equation was tested for Multicollinearity and Table 5.3 shows that the mean Variance Inflation Factors (VIFs) of 1.21 is less than 10, thus tolerance level for Multicollinearity. The table also shows that the values of VIF for all variables are very low and less than 10, thus there is no problem of Multicollinearity in the model (see Appendix E.1 for VIF test).

Table 5.3: Variance Inflation Factor for Income per Capita Equation

Variable	VIF	1/VIF
Membership	1.36	0.73
Age of household head square	1.30	0.77
Distance	1.28	0.78
Education of household head	1.19	0.84
Land per capita	1.16	0.86
Dtobacco	1.11	0.90
C-W ratio	1.07	0.94
	Mean VIF	**1.21**

The IV model for income equation was tested for Heteroskedasticity using Breusch-Pagan test and its results show that there is no Heteroskedasticity, it was found that the computed chi-square value (3.1) does not exceed the chi-square value (14.07) at 5% level of significance with degree of freedom of 1 (refer to Appendix E.1 for Breusch-Pagan test).

5.2.3 Impact of COMSIP on Credit per Capita

5.2.3.1 Membership

Credit acquired was determined by whether one was a member to COMSIP group or not. Membership to COMSIP group increases credit per capita by 96%. This implies that affiliation to COMSIP group increases access to credit which in turn might be used in several ways, some of which would be translated in increased income per capita (Table 5.4).

5.2.3.2 Age of the household head (x_2)

The coefficient for variables age of household head is positive. This is consistent with theory. The age of head is expected to be positive in the credit equation because as age increases one's asset holding might increase. This in turn may act as collateral in other credit sources. The results show that age is the determinant of credit acquisition at 5% level of significance (Table 5.4).

5.2.3.3 Education of household head (x_3)

The coefficient for variable education of head is negative. This is inconsistent with theory. This is the case because in COMSIP program, more educated farmers have higher incomes and also have access to credit in other financial institutions other than COMSIP groups hence do not need small credits from COMSIP groups which actually are meant for revolving funds among the poor and not educated farmers. What matters in COMSIP groups for somebody to access credit; he/she must just undergo entrepreneurship trainings and engage in small businesses.

However, heads of households with more years of education are able to understand the benefits of obtaining credits from COMSIP groups. This is why education is the determinant of credit in line with the results in Table 5.4, which shows that it is significant at 1% level of significance.

5.2.3.4 Consumer-worker ratio (x_4)

The results in Table 5.4 show that variable C-w ratio positive and this is consistent with theory since C-w ratio variable can take any sign in credit equation reflecting the effect of labour in credit decisions. According to the result in the table C-w ratio is not the determinant of credit acquisition of a particular household from a COMSIP group.

5.2.3.5 Dtobacco (x_8)

The results in Table 5.4 show that variable Dtobacco is negative and this is inconsistent with theory. The tobacco farmers are generally well to do farmers. They normally own the big land of more than 0.5 acres on which they are able to grow commercial crops. COMSIP program is meant for poor farmers who normally have very small piece of land of less than 0.5 acres. Tobacco farmers are not allowed to access credits in COMSIP program. By the way these tobacco farmers realize incomes after a long period, normally a year (growing season). COMSIP program encourages members to engage in small businesses upon accessing credits for them as a group to be able to lend to other small-scale businesses farmers within a very short period of time. The COMSIP funds in a group acts as a revolving funds to the members of a particular group.

In the results of Table 5.4, this justifies the reason why Tobacco is not consistent with theory in credit equation and even not a significant determinant in increasing credit acquisition for members of COMSIP groups, particularly in the COMSIP program per se.

Table 5.4: Credit per Capita Equation[a]

Credit per capita	Coefficient[b]	Robust Standard Error	P-value
Membership	0.957535[***]	0.2635064	0.000
Age of household head (x_2)	1.812725[**]	0.8480184	0.033
Education of head (x_3)	-0.3063165[***]	0.1084921	0.005
C-w ratio (x_4)	0.0202639	0.0179135	0.258
Dtobacco (x_8)	-0.1367287	0.1404488	0.330
_cons	-2.359728[**]	1.162735	0.042

    a.   F $(7, 142) = 7.50$, Uncentered $R^2 = 0.36$, MSE $= 0.82$

    b.   *Significance levels: [*]10%, [**]5%, [***]1%.*

The IV model for credit equation was tested for Multicollinearity and Table 5.5 results below show that the mean Variance Inflation Factors (VIFs) of 1.21 is less than 10, thus tolerance level for Multicollinearity (refer to appendix E.3 for VIF test).

Table 5.5 Variance Inflation Factor for Credit Equation

Variable	VIF	1/VIF
Age of household head	7.81	0.13
Age of household head squared	7.62	0.13
Membership	1.36	0.73
Distance	1.28	0.78
Land per capita	1.17	0.86
Education of head	1.13	0.89
Dtobacco	1.09	0.92
C-w ratios	1.07	0.93
	Mean VIF	**2.82**

The IV model for credit equation was tested for Heteroskedasticity using Breusch-Pagan test and its results show that there is no Heteroskedasticity, it was found that the computed chi-square value (1.55) does not exceed the chi-square value (15.51) at 5% level of significance with degree of freedom of 1 (refer to Appendix E.3 for Breusch-Pagan test).

CHAPTER 6

CONCLUSIONS AND POLICY IMPLICATIONS

This study analyses the impact of Community Savings and Investment program (COMSIP) activities on household income and credit of member households of COMSIP groups in Kasungu District in Central Malawi. Using data from COMSIP Cooperative Union limited for Kasungu District in Malawi on income per capita and access to credit, this study tests the hypothesis that these variables were positively impacted on by membership to these COMSIP groups. The study uses Instrumental Variables (IV) methodology organized to reduce selection bias as well as endogeneity problems in the sample. The primary data on socio-economic and demographic variables was collected using household questionnaires, Key Informant Interviews and literature review as tools from a sample of 150 households.

Probit analysis results show that sex of household head ($p < 0.05$), credit per capita ($p < 0.01$), land per capita ($p < 0.01$) and distance ($p < 0.05$) determines household decision to join the COMSIP groups. The results also show that COMSIP groups attract females more than males. The results show that age of household head, education of household head, consumer-worker ratio and tobacco growing; do not determine household decision to join COMSIP groups. Consequently, the null hypothesis that socio-economic, demographic and institutional factors do not influence a household's decision to join a COMSIP cooperative group is partially rejected.

The overall results suggest that the impact of COMSIP groups on household income is very strong. There is also evidence that COMSIP groups have increased household access to credit in Kasungu district. The IV estimates indicate an increase of 88% income per

capita and 96% increase in credit per capita of relatively poor participating households. The findings also indicate that the simple targeting mechanism of COMSIP program based on household land ownership size of less than 0.005 hectares plays a very crucial role in making sure that at least most of the members of COMSIP groups are the poor farmers. Although this cannot guarantee 100% of poor farmers being targeted in the COMSIP program as perfect monitoring is difficult in targeting only the poor.

Microfinance which has begun as an alternative mechanism for providing credit to the poor, is being viewed today by NGOs, government and the international organizations alike as an effective instrument in the fight against poverty throughout the world. Sri Lanka with a long history of microfinance spanning for over several decades has embraced microfinance as a key instrument in own poverty alleviation programs. This is also evidenced by results of other studies as follows:

Dunn and Arbuckle in 2001 examined the impact of Mibanco, an MFI working with moderately poor clients, as well as those above the poverty line. Regression results showed that these new clients earned $740 per year more than non-clients, and for all clients compared to non-participants, clients earned $266 more *per household member* per year than non-participants.

Microcredit also appeared to have positive impact on household income. Given the same 1997 income level, treatment group households were estimated to have US$1200 more in 1999 annual income and US$266 more in per capita income (both in real terms) than comparable control group households (Dunn and Arbuckle, 2001). In 2007, Operations Evaluation Department, Asian Development Bank, showed the impact of microfinance

loans on per capita income, per capita expenditures, on two definitions of per capita savings and per capita food expenditures. There was a mildly statistically significant (significance level of 10%) positive impact on per capita income.

Microfinance services in Sri Lanka have a wide geographical outreach but the extent of outreach of private operators including NGOs and commercial banks in rural is limited. Although the poor and the poorest groups have been reached by microfinance institutions, a significant proportion of their clientele seems to be from the non-poor groups. Microfinance has helped households in middle quintiles to increase their income and assets; helped the very poor to increase consumption expenditure; has worked as instrument of consumption smoothing among almost all income groups; and has helped women to increase their social status and improve the economic conditions. The study also finds that informal financial markets are pervasive across distance and among different income groups (Tilakaratna, 2005).

On the economic aspect COMSIP in general, has enabled the households to improve their income, assets, expenditures etc. Furthermore, credit has supported income and employment generating activities among their clients. However, many businesses that have started under COMSIP are either micro-enterprises or small-scale self-employment activities that use little or no technology and skills. It is important to note that COMSIP have played a crucial role in inculcating savings habits among their members, particularly those from the poorest categories. A significant proportion of households have had no savings in any institutions before joining COMSIP groups (Tsegaye, 2003).

COMSIP in Malawi also seem have played a significant role in a number of areas such as helping households particularly those who are poor to increase their income and assets. Thus, COMSIP has played a positive role in combating poverty and improving living conditions of households. Nevertheless, it is important to recognize that financial services alone are not sufficient to raise the living conditions of the poor. Some critical questions that the poor as well as the not-so-poor face remain to be unsolved. To name a few, the poor (including micro-entrepreneurs) often have limited access to markets or the existing markets in rural areas are highly inadequate; the poor have limited opportunities for developing necessary skills required for economic activities; and technology is often too expensive or inaccessible to the poor. As a result, even when the poor is capable of borrowing from MFIs or COMSIP and starting up new ventures or micro-enterprises; the sustainability of them becomes an issue. Therefore, a comprehensive framework where many of these problems are addressed needs to be put in place. It is important that COMSIP facilitate or involve directly in providing various credit plus services that include skill development/training, marketing facilities and business development services to their clients, particularly low income groups to help them to sustain their economic activities supported by COMSIP and other microfinance institutions.

In addition, a number of factors limit the expansion of COMSIP or MFIs in general in remote rural areas. The most critical factors are the poor infrastructure such as poor roads, transportation and communication facilities and the limited opportunities available for the rural poor, particularly in non-agricultural activities. Hence, implementation of a capacity designed development program aimed at removing these bottlenecks is crucial to improve

the outreach of COMSIP in remote rural areas and to encourage the private and the NGO sectors to engage in the provision of microfinance services more effectively.

The critical policy conclusion from the study is that low-income households that have sound financial management practices can benefit from a well-developed microfinance industry. A microfinance industry that provides a full range of services for small transactions may increase to the options enough to provide the critical boost that low-income households need to achieve their goals.

CHAPTER 7

RECOMMENDATIONS

7.1   Scaling-up COMSIP Program

With significant achievements in recent years, COMSIP needs to be actively supported since among alternatives in microfinance sector, this is where there appears to be maximum potential for scaling-up.

COMSIP Cooperative Union Limited should involve having the COMSIP groups save, and then linking them to the banks. Funds saved by these COMSIP groups should be placed in a group deposit account in the bank. The group then borrows from the bank using its saving and group guarantee as the collateral. As the group matures, and based on the group's track record, banks are ready to lend more. Borrowed and saved funds should be rotated through lending within the group using flexible repayment schedules (usually monthly repayments). COMSIP group thus save, borrow and repay collectively. The COMSIP funds may be distributed either to one or more members of the group who are personally responsible for repayment to the group or spent collectively by the group. The group should be free to decide the interest rate charged to its members. After a loan from a bank is fully repaid, the group may borrow again, often a larger amount. Development of rural infrastructure facilities is also of prime importance to improve the outreach of COMSIP groups in remote rural areas and encouraging the private and NGO sectors to involve more effectively in microfinance provision.

7.2 Improve Capacity Building of COMSIP groups

There is concern that has emerged about COMSIP group quality and their ability to manage finances. There is need to ensure that high quality COMSIP groups are created and maintained. In particular, the success and sustainability of COMSIP group will depend crucially upon greater clarity about who is to play the key role of maintaining quality and how the cost of doing so are to be met. The COMSIP Cooperative Union Limited should be ideal as responsible institution to maintain quality of COMSIP groups and NGOs should also be engaged to complement the effort to maintain the quality of COMSIP groups. Similarly attention is needed to ensure the quality of COMSIP groups as regards to their governance and management structures and adequate internal controls and finance discipline.

7.3 Increase Awareness of COMSIP Program among the Communities

If the cross-sectional analysis like this study is able to register gains from participation, chances are that the long-run effect of participation may be increased gains as individuals would adjust their economic behaviors in various ways in a bid to benefit more from the COMSIP groups. Considering that approximately 80% of Malawians live in the rural areas where agriculture emerges the mainstay of their economies, it is important to consolidate any interventions that seek to ameliorate harsh conditions in these areas. The findings in this study show that smallholder farmers' participation in COMSIP groups has the possibility of increasing their credit obtained.

7.4 Promote Credit Injection into rural poor

The COMSIP approach should be designed to combine the safety and reliability of formal finances with the convenience and flexibility that are typically associated with informal finance. They should typically involve providing thrift, credit and other financial services and products of very small amounts to the poor, with the aim to raise income levels and improve living standards.

Credits will engage small holder farmers in small-scale businesses or revolving funds within the rural communities. Smallholder farmers should be given more opportunities to access credits for them to engage into these small-scale businesses' activities such as small dairy farming, light manufacturing, buying and selling of vegetables for profits.

7.5 Appropriate products and services are critical to ensuring effectiveness

Product design is the means of targeting. Lending in groups and sending COMSIP Cooperative Union Limited to villages to maintain quality of COMSIP is credited with much of microfinance's appeal. There is need to create a loan product that allow borrowers to repay in small, weekly installments. This will suit poor households well, since they can repay out of regular bits of income coming in daily or near-daily. Also charging appropriate interest rates will also assist stem leakage of resources from target populations to those richer or politically favoured.

7.6 Introduce Integrated Agricultural Service Provider (IASP) Approach

The bank should identify an Integrated Agricultural Service Provider (IASP) that has a good relationship with COMSIP groups; and provides genuine and timely information

through extension services and enters into a tripartite agreement with the IASP and the output buyer. Credit is provided to COMSIP on the recommendation of the IASP, the COMSIP member pledges his produce to the output buyer at a market based price, IASP provides inputs to the COMSIP groups. Loan processing, disbursement and collection are effectively done by the IASP, while the credit decision remains nominally with the bank. At the end of the season, the COMSIP group supplies the crop to the output buyer and the output buyer deducts the loan amount from the sale proceeds and remit the loan to the bank in full settlement of the loan amount. The IASP receives a service fee for the loan processing and supervision services (% on the recovered loan). This creates a symbiotic relationship between the input supplier, financier and trader. This will reduce transaction costs and the risk expose of all parties and therefore, presents a relatively low-cost way of serving the rural poor engaged in marginal or smaller farming. It helps improve information collection, reduces credit risk and increases access to rural financing.

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APPENDICES

Appendix A

A.1 Computation of Chi-square Test for Significance of Sex Variable Differences

The research hypothesis: the proportions of the female and the male members of COMSIP groups are significantly different.

The null hypothesis: the proportions of the female and the male members of COMSIP groups are not significantly different.

To calculate Chi Square, compare the original, observed frequencies with the new, expected frequencies. For each cell, perform the following calculations:
a) Subtract the value of the observed frequency from the value of the expected frequency
b) Square the result
c) Divide the result by the value of the expected frequency

Table A.1: Expected Frequency

	Female	**Male**
Non-members	35.97333333	40.02666667
Member	35.02666667	38.97333333
Total	71	79

Table A.2: Chi-square Value

(Expected freq-Observed Freq)	**(Expected freq-Observed freq)^2**	**[(Expected freq-Observed freq)^2]/Expected freq=results**
12.97333333	168.3073778	4.67867062
-12.97333333	168.3073778	4.805121178
-12.97333333	168.3073778	4.20488119
12.97333333	168.3073778	4.318526628
	Total	18.00719962

Thus, Computed Chi-square value is 18.00

Calculate the degrees of freedom of the contingency table, df = 1

Select the level of alpha, p = 0.05

Look up the Chi Square value in the table at p =0.05 and df =1, thus Chi Square=3.84

Interpret the result: The computed value of Chi-Square (18.00) exceeds the value in the table for p = 0.05 and df = 1 (Chi-Square = 3.84). Therefore, we can reject the null hypothesis (with a 5% probability of error) and accept the research hypothesis that the proportions of the female and the male members of COMSIP groups are significantly different.

Appendix B

B.1: Computation of Chi-square Test for Tobacco Growers and Non-Tobacco Growers

The research hypothesis: the proportions of the tobacco growers and non-tobacco growers who are members of COMSIP groups are significantly different.

The null hypothesis: the proportions of the tobacco growers and non-tobacco growers who are members of COMSIP groups are not significantly different.

To calculate Chi Square, compare the original, observed frequencies with the new, expected frequencies. For each cell, perform the following calculations:
a) Subtract the value of the observed frequency from the value of the expected frequency
b) Square the result
c) Divide the result by the value of the expected frequency

For each cell from observed frequency in Table 4.1,

Table B.1: Expected Frequency

	Non-tobacco growers	Tobacco growers	Total
Non-members	33.44	42.56	76
Members	32.56	41.44	74
	66	84	150

Table B.2: Chi-square

(Expected freq-Observed Freq)	(Expected freq-Observed freq)^2	[(Expected freq-Observed freq)^2]/Expected freq=results
-3.56	12.6736	0.378995215
3.56	12.6736	0.389238329
3.56	12.6736	0.297781955
-3.56	12.6736	0.305830116
	Total	1.371845615

Thus, Computed Chi-square value is 1.37

Calculate the degrees of freedom of the contingency table, df = 1

Select the level of alpha, p = 0.05

Look up the Chi Square value in the table at p =0.05 and df =1, thus Chi Square=3.84

Interpret the result: The computed value of Chi-square (1.37) is less than the value in the table for p = 0.05 and df = 1 (Chi-Square = 3.84). Therefore, we can reject the research hypothesis (with a 5% probability of error) and accept the null hypothesis that the proportions of the tobacco growers and non-tobacco growers who are members of COMSIP groups are not significantly different.

Appendix C

C.1: Means, Standard Deviations, Minimum and Maximum

Table C.1: Comparison of Socio-economic Characteristics of COMSIP members and Non-members

```
Summary statistics: mean, sd, min, max
  by categories of: membership
```

membership	ageofh~e	educa~ad	ageof~ad	cwratio	lninco~a	lncred~a	loglan~e	logdis~e
0	1920.105	2.776316	42.15789	2.421053	11.88042	1.406894	-.2626058	.5613869
	1039.287	1.228535	12.03002	.927551	.5699744	3.645756	.4977683	.1972191
	144	1	12	1	10.49127	0	-1	0
	4489	5	67	5	13.48701	11.51293	.7403627	.90309
1	1222.459	3.283784	33.51351	2.351351	12.07917	9.537403	-.4535361	.3772988
	712.4474	1.339804	10.03315	.9570565	.7118602	.4662006	.4026913	.2467661
	144	1	12	0	9.472705	7.600903	-1	0
	3136	5	56	5	13.64116	10.59663	.7403627	.7781513
Total	1575.933	3.026667	37.89333	2.386667	11.97847	5.417945	-.3567981	.4705701
	956.4708	1.305367	11.87301	.9397034	.6494128	4.840569	.4618862	.240706
	144	1	12	0	9.472705	0	-1	0
	4489	5	67	5	13.64116	11.51293	.7403627	.90309

C.2: Computation of Chi-square Test
Table C.2: Observed Frequency

	Members	Non-members	Total

Age of head Squared	1222.46	1920.11	3142.57
Education (scores)	3.28	2.78	6.06
C-W ratio	2.35	2.42	4.77
Income per capita	12.08	11.88	23.96
Credit per capita	9.54	1.41	10.95
Land per capita	-0.45	-0.26	-0.71
Distance	0.38	0.56	0.94
Total	1249.64	1938.9	3188.54

Table C.3: Expected Frequency

	Members	Non-members	Total
Age of head Squared	1231.623619	1910.946381	3142.57
Education (scores)	2.375011259	3.684988741	6.06
C-W ratio	1.869439555	2.900560445	4.77
Income per capita	9.390308542	14.56969146	23.96
Credit per capita	4.29148074	6.65851926	10.95
Land per capita	-0.278260395	-0.431739605	-0.71
Distance	0.368401086	0.571598914	0.94
Total	1249.64	1938.9	3188.54

C.3: Chi-Square Test for Significance of Continuous Variables Differences

The research hypothesis: the continuous variables for members and non-members of COMSIP groups are significantly different from one another.

The null hypothesis: the continuous variables for members and non-members of COMSIP groups are not significantly different from one another.

To calculate Chi-square, compare the original, observed frequencies with the new, expected frequencies. For each cell, perform the following calculations:
a) Subtract the value of the observed frequency from the value of the expected frequency
b) Square the result
c) Divide the result by the value of the expected frequency

For each cell from observed frequency in Table 5.4,

Table C.4: Chi-square value

(Expected freq-Observed Freq)	(Expected freq-Observed freq)^2	[(Expected freq-Observed freq)^2]/Expected freq=results
9.163619211	83.97191705	0.068179853
-0.904988741	0.819004621	0.344842416
-0.480560445	0.230938341	0.123533462
-2.689691458	7.234440137	0.770415594
-5.24851926	27.54695442	6.418985913
0.171739605	0.029494492	-0.105996011
-0.011598914	0.000134535	0.000365186
-9.163619211	83.97191705	0.043942581
0.904988741	0.819004621	0.222254308
0.480560445	0.230938341	0.079618524
2.689691458	7.234440137	0.49654038
5.24851926	27.54695442	4.137099157
-0.171739605	0.029494492	0.051599979
0.011598914	0.000134535	6.93872E-08
	Total	12.65138141

Thus, Computed Chi-square value is 12.65

Calculate the degrees of freedom of the contingency table, df = 6

Select the level of alpha, p = 0.05

Look up the Chi Square value in the table at p =0.05 and df =1, thus Chi Square=12.59

Interpret the result: The computed value of Chi-square (12.65) is exceeds the value in the table for p = 0.05 and df = 1 (Chi-square = 12.59). Therefore, we can reject the null hypothesis (with a 5% probability of error) and accept the research hypothesis that the continuous variables for members and non-members of COMSIP groups are significantly different from one another.

Appendix D: Membership Equation

D.1: General Probit Analysis

```
. probit membership ageofhouseholdheadyrs sexofhouseholdhead logdistancekm dtobacco landpercapitainlog eduationofheadinsc
> ores cwratio, robust

Iteration 0:   log pseudolikelihood = -103.95874
Iteration 1:   log pseudolikelihood = -37.369265
Iteration 2:   log pseudolikelihood = -33.153202
Iteration 3:   log pseudolikelihood = -32.522407
Iteration 4:   log pseudolikelihood = -32.511324
Iteration 5:   log pseudolikelihood = -32.511308
Iteration 6:   log pseudolikelihood = -32.511308


Probit regression                                Number of obs   =        150
                                                 Wald chi2(7)    =      33.39
                                                 Prob > chi2     =     0.0000
Log pseudolikelihood = -32.511308                Pseudo R2       =     0.6873
```

membership	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
ageofho~dyrs	.0181341	.0236711	0.77	0.444	-.0282605	.0645287
sexofhouse~d	.7268268	.3233712	2.25	0.025	.0930309	1.360623
logdistanc~m	-1.318719	.5108672	-2.58	0.010	-2.32	-.3174379
dtobacco	.4447204	.3629855	1.23	0.221	-.2667182	1.156159
landpercap~g	-5.059743	1.287645	-3.93	0.000	-7.583482	-2.536005
eduationof~s	-.0367467	.1896976	-0.19	0.846	-.4085473	.3350538
cwratio	.1822057	.177028	1.03	0.303	-.1647627	.5291742
_cons	-2.44251	1.716812	-1.42	0.155	-5.807401	.9223805

Appendix E: Impact of COMSIP on Household Income and Credit

E.1: Tests for Multicollinearity and Heteroskedasticity for Income Equation

```
. vif

    Variable |      VIF     1/VIF
-------------+----------------------
  membership |     1.41    0.707921
   ageofhead |     1.31    0.763966
  logdistance |    1.28    0.781883
 educationo~d |    1.19    0.837944
  loglandacre |    1.19    0.839476
 creditperc~5 |    1.16    0.863141
    dtobacco |     1.12    0.896059
    cwratios |     1.08    0.928486
-------------+----------------------
    Mean VIF |     1.22

. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of lnincomepercapita

        chi2(1)     =      3.57
        Prob > chi2 =    0.0587
```

E.2: IV 2sls Estimation for Income Equation

```
. ivreg2 lnincomepercapita ageofhead cwratios dtobacco educationofhead creditpercapita5 ( membership= loglandacre logdi
> stance), robust first

First-stage regressions
───────────────────────


First-stage regression of membership:

OLS estimation
──────────────


Statistics robust to heteroskedasticity

                                                    Number of obs =      150
                                                    F(  7,   142) =    16.72
                                                    Prob > F      =   0.0000
Total (centered) SS   =  37.49333333               Centered R2   =   0.2921
Total (uncentered) SS =          74                Uncentered R2 =   0.6413
Residual SS           =  26.54232513               Root MSE      =    .4323
```

membership	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
ageofhead	-.012477	.0029923	-4.17	0.000	-.0183922	-.0065618
cwratios	-.0117141	.0076816	-1.52	0.129	-.0268991	.0034709
dtobacco	.0049526	.0768554	0.06	0.949	-.1469759	.1568811
educationo~d	.0208089	.0302808	0.69	0.493	-.0390506	.0806683
creditperc~5	.0992682	.076408	1.30	0.196	-.0517759	.2503123
loglandacre	-.02487	.0758938	-0.33	0.744	-.1748977	.1251577
logdistance	-.6492137	.1614358	-4.02	0.000	-.9683418	-.3300856
_cons	1.239264	.2186068	5.67	0.000	.8071196	1.671408

```
Included instruments: ageofhead cwratios dtobacco educationofhead
                      creditpercapita5 loglandacre logdistance
───────────────────────────────────────────────────────────────
Partial R-squared of excluded instruments:   0.1195
Test of excluded instruments:
  F( 2,   142) =    9.77
  Prob > F     =   0.0001
```

Summary results for first-stage regressions
————————————————————————————————————

Variable	Shea Partial R2	Partial R2	F(2, 142)	P-value
membership	0.1195	0.1195	9.77	0.0001

NB: first-stage F-stat heteroskedasticity-robust

Underidentification tests
Ho: matrix of reduced form coefficients has rank=K-1 (underidentified)
Ha: matrix has rank=K (identified)

	Chi-sq(2)	P-value
Anderson canon. corr. -N*ln(1-CCEV) LR stat.	19.09	0.0001
Cragg-Donald N*CDEV statistic	20.36	0.0000
Robust chi-square statistic	20.64	0.0000

Weak identification tests
Ho: equation is weakly identified
Cragg-Donald (N-L)*CDEV/L1 F-statistic   9.64
Robust F-statistic   9.77
See main output for Cragg-Donald weak id test critical values

NB: Anderson and Cragg-Donald under- and weak identification stats not robust
    Robust identification stats heteroskedasticity-robust

Weak-instrument-robust inference
Tests of joint significance of endogenous regressors B1 in main equation
Ho: B1=0 and overidentifying restrictions are valid
Anderson-Rubin test   F(2,142)= 3.32   P-val=0.0389
Anderson-Rubin test   Chi-sq(2)=7.02   P-val=0.0299
Stock-Wright S statistic   Chi-sq(2)=5.90   P-val=0.0523
NB: Test statistics heteroskedasticity-robust

Number of observations N   =   150
Number of regressors   K   =   7
Number of instruments   L   =   8
Number of excluded instruments L1 =   2

IV (2SLS) estimation
_____

Statistics robust to heteroskedasticity

		Number of obs =	150
		F(6, 143) =	1.32
		Prob > F =	0.2540
Total (centered) SS = 62.83881036		Centered R2 =	-0.1543
Total (uncentered) SS = 21585.40112		Uncentered R2 =	0.9966
Residual SS = 72.53578168		Root MSE =	.6954

lnincomepe~a	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
membership	.8775618	.3607352	2.43	0.015	.1705337	1.58459
ageofhead	.0089189	.0069719	1.28	0.201	-.0047458	.0225835
cwratios	.0196636	.0123049	1.60	0.110	-.0044537	.0437808
dtobacco	-.0673405	.1174242	-0.57	0.566	-.2974877	.1628066
educationo~d	-.0323876	.0399994	-0.81	0.418	-.110785	.0460099
creditperc~5	-.1359564	.1009422	-1.35	0.178	-.3337994	.0618867
_cons	11.29569	.4498929	25.11	0.000	10.41392	12.17746

Anderson canon. corr. LR statistic (underidentification test):   19.091
                                          Chi-sq(2) P-val =   0.0001
Test statistic(s) not robust
_____

Cragg-Donald F statistic (weak identification test):   9.637
Stock-Yogo weak ID test critical values: 10% maximal IV size   19.93
                                          15% maximal IV size   11.59
                                          20% maximal IV size   8.75
                                          25% maximal IV size   7.25
Test statistic(s) not robust
Source: Stock-Yogo (2005). Reproduced by permission.
_____

Hansen J statistic (overidentification test of all instruments):   0.184
                                          Chi-sq(1) P-val =   0.6675
_____

Instrumented: membership   97
Included instruments: ageofhead cwratios dtobacco educationofhead
                     creditpercapita5
Excluded instruments: loglandacre logdistance
_____

E.3: Tests for Multicollinearity and Heteroskedasticity for Credit Equation

```
. vif
```

Variable	VIF	1/VIF
ageofheads~e	7.81	0.128037
logageofhead	7.62	0.131195
membership	1.36	0.734992
logdistance	1.28	0.782831
loglandsize	1.17	0.856830
educationw~d	1.13	0.885707
dtobacco	1.09	0.917497
cwratios	1.07	0.931257
Mean VIF	2.82	

```
. estat hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
        Ho: Constant variance
        Variables: fitted values of creditpercapita5

        chi2(1)      =     1.55
        Prob > chi2  =   0.2137
```

E.4: IV 2sls Estimation for Credit Equation

```
. ivreg2 creditpercapita5 logageofhead ageofheadsquare cwratios dtobacco  educationweighted (membership=  loglandsize log
> distance), robust first

First-stage regressions
───────────────────────

First-stage regression of membership:

OLS estimation
──────────────

Statistics robust to heteroskedasticity

                                                    Number of obs =      150
                                                    F(  7,   142) =    14.01
                                                    Prob > F      =   0.0000
Total (centered) SS    = 37.49333333               Centered R2   =   0.2650
Total (uncentered) SS  =         74                Uncentered R2 =   0.6276
Residual SS            = 27.55730488               Root MSE      =    .4405
```

membership	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
logageofhead	-.196979	.7196487	-0.27	0.785	-1.619589	1.225631
ageofheads~e	-.0001487	.0000974	-1.53	0.129	-.0003413	.0000438
cwratios	-.0098105	.0077092	-1.27	0.205	-.0250502	.0054291
dtobacco	.0089074	.0760947	0.12	0.907	-.1415174	.1593322
educationw~d	.0440489	.1046668	0.42	0.675	-.1628576	.2509554
loglandsize	-.0668266	.0781834	-0.85	0.394	-.2213804	.0877273
logdistance	-.693623	.1600192	-4.33	0.000	-1.009951	-.3772952
_cons	1.384722	.9521258	1.45	0.148	-.4974505	3.266895

```
Included instruments: logageofhead ageofheadsquare cwratios dtobacco
                      educationweighted loglandsize logdistance
─────────────────────────────────────────────────────────────────────
Partial R-squared of excluded instruments:   0.1449
Test of excluded instruments:
  F(  2,   142) =    14.92
  Prob > F      =   0.0000
```

Summary results for first-stage regressions
_____

Variable | Shea Partial R2 | Partial R2 | F(2, 142)   P-value
membership | 0.1449 | 0.1449 | 14.92   0.0000

NB: first-stage F-stat heteroskedasticity-robust

Underidentification tests
Ho: matrix of reduced form coefficients has rank=K-1 (underidentified)
Ha: matrix has rank=K (identified)

                                              Chi-sq(2)   P-value
Anderson canon. corr. -N*ln(1-CCEV) LR stat.   23.49   0.0000
Cragg-Donald N*CDEV statistic   25.43   0.0000
Robust chi-square statistic   31.53   0.0000

Weak identification tests
Ho: equation is weakly identified
Cragg-Donald (N-L)*CDEV/L1 F-statistic   12.04
Robust F-statistic   14.92
See main output for Cragg-Donald weak id test critical values

NB: Anderson and Cragg-Donald under- and weak identification stats not robust
    Robust identification stats heteroskedasticity-robust

Weak-instrument-robust inference
Tests of joint significance of endogenous regressors B1 in main equation
Ho: B1=0 and overidentifying restrictions are valid
Anderson-Rubin test   F(2,142)= 13.76   P-val=0.0000
Anderson-Rubin test   Chi-sq(2)=29.07   P-val=0.0000
Stock-Wright S statistic Chi-sq(2)=18.13   P-val=0.0001
NB: Test statistics heteroskedasticity-robust

Number of observations N   =   150
Number of regressors   K   =   7
Number of instruments L   =   8
Number of excluded instruments L1 =   2

IV (2SLS) estimation
_____

Statistics robust to heteroskedasticity

```
                                          Number of obs =       150
                                          F(  6,   143) =      7.50
                                          Prob > F      =    0.0000
Total (centered) SS   = 106.1153758       Centered R2   =    0.0405
Total (uncentered) SS = 160.1975994       Uncentered R2 =    0.3644
Residual SS           = 101.8144933       Root MSE      =     .8239
```

creditperc~5	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf. Interval]	
membership	.957635	.2635064	3.63	0.000	.441172	1.474098
logageofhead	1.812725	.8480184	2.14	0.033	.1506398	3.474811
ageofheads~e	-.0001962	.00013	-1.51	0.131	-.000451	.0000586
cwratios	.0202639	.0179135	1.13	0.258	-.0148459	.0553738
dtobacco	-.1367287	.1404488	-0.97	0.330	-.4120033	.1385459
educationw~d	-.3063165	.1084921	-2.82	0.005	-.5189571	-.0936759
_cons	-2.359728	1.162735	-2.03	0.042	-4.638646	-.0808096

```
Anderson canon. corr. LR statistic (underidentification test):      23.489
                                                  Chi-sq(2) P-val =   0.0000
Test statistic(s) not robust
```

```
Cragg-Donald F statistic (weak identification test):               12.036
Stock-Yogo weak ID test critical values: 10% maximal IV size        19.93
                                         15% maximal IV size        11.59
                                         20% maximal IV size         8.75
                                         25% maximal IV size         7.25
Test statistic(s) not robust
Source: Stock-Yogo (2005).  Reproduced by permission.
```

```
Hansen J statistic (overidentification test of all instruments):    3.084
                                                  Chi-sq(1) P-val =   0.0791
```

```
Instrumented:        membership
Included instruments: logageofhead ageofheadsquare cwratios dtobacco
                      educationweighted
Excluded instruments: loglandsize logdistance
```

Appendix F: Household Survey Questionnaire

A. Identification Panel

District		Date:
Name of Traditional Authority		
Name of Village		**Questionnaire Number:**
Name of Respondent		

B. Household Characteristics

1. Sex of respondent (Please tick as appropriate)

1	Male	
2	Female	

2. Age of respondent (Please tick as appropriate)

1	Up to 21	
2	22 to 38	
3	39 to 60	
4	60 to 80	
5	>80	
6	Don't know	

3. Marital Status (Please tick as appropriate)

1	Married	
2	Divorced	
3	Widowed	
4	Separated	
5	Single	

4. Level of education (Please tick as appropriate)

1	No education	
2	Adult literacy	
3	1-3	
4	4-6	
5	7-8	
6	1-2	
7	3-4	

Hint: Education is a score variable i.e. Standard 1-3=1, Standard 4-6=2, Standard 7-8=3, Forms 1-2=4, Forms 3-4=5

5. Are you the head of the household? If yes, go to question 8.

1	Yes	
2	No	

6. Sex of the household head (Please tick as appropriate)

1	Female	
2	Male	

7. What is your relationship to the household head?

1	Spouse	
2	Son	
3	Daughter	
4	Grandson	
5	Grand Daughter	
6	Son-in-law	
7	Mother	
8	Father	
9	Other (Specify)	

8. What is the household Size? (Please tick as applicable)

1	Up to 3 people	
2	4 to 6 people	
3	7 to 10	
4	More than to people	

9. What is the primary occupation of the household head? (Please tick as appropriate)

1	Smallholder Farmer	
2	Small Scale Business	
3	Worker (employed)	
4	Ganyu-laborer	
5	Other (Specify)	

C. Sources of Income and Expenditure

10. What are your major sources of income? (Please tick more than one as appropriate)

1	Livestock Sales	
2	Crop Sales	
3	COMSIP Small Scale businesses	
4	Small scale businesses other than COMSIP activities	
5	Ganyu	
6	Pension	
7	Wages/salaries	
8	Remittances from relatives	
9	Fishing	
10	Other (Specify)	

11. Approximately how much do you earn per month from the following non-farm income sources? (Please indicate the estimated total amount realized per month)

	Non-farm income sources	**Amount earned (MK) per month**
1	Pension	
2	Salaries	
3	Remittances from relatives	
4	Bicycle Tax (Kabanza)	
5	Charcoal Sales	
6	Firewood sales	
7	Other (specify)	

Hint: 1 = ≤K5000 per month

2 = ≥K5500≤K10000 per month

3 = ≥K10500≤K15000 per month

4 = ≥K15500≤K20000 per month

5 = ≥K20500≤K30000 per month

6 = ≥30500 per month

D. Membership

12. Are you a member of any group? (Please tick an applicable)

1	Yes	
2	No	

13. If yes, what type of group is it? (Please tick as appropriate)

1	Club	
2	ciation/trust	
3	COMSIP Cooperative/group	
4	Other (Specify)	

14. If you are a member of COMSIP group, what factor influenced you to join the group? (Please tick more than one as appropriate)

Access to credits	Yes (=1)	No (=2)
Save money		
High price of fertilizers		
Lack of working capital/cash		
Awareness of COMSIP activities		
Lack of market access		
COMSIP entrepreneurship activities		
Proximity of COMSIP activities		
Nearness to local government office		
Other (Specify)		

E. Enterprises

15. Does your group engage in any type of enterprises?

1	Yes	
2	No	

16. If yes, please tick what type of enterprise do you engage in?

Rearing small livestock	Yes (=1)	No (=2)
Commercial farming		
Selling livestock		
Selling of vegetables		
Selling of fruits		
Selling of charcoal		

F. Access to Fertilizer

17. Do you apply fertilizer on your farmland during planting season? If no, go to question 2.

1	Yes	
2	No	

18. If yes, how do you access fertilizer? (Please tick more than one as appropriate)

Through COMSIP credits	Yes (=1)	No (=2)
Through Cash (income) realized from COMSIP initiatives		
Through other financial institutions other than COMSIP groups		
Through government Fertilizer Subsidy Programme		
Through NASFAM fertilizer loan arrangements		
Through NASFAM		
Through Alliance One fertilizer loan arrangements		

19. If no, why? (Please tick as appropriate)

Due to drought	
Lack of working capital/cash	
High price of fertilizers	
Choice of enterprise	
Lack of awareness	
Shortage of fertilizers in locality	

G. Land Holding Size
20. Do you own land?

1	Yes	
2	No	

21. If yes, what type land holding arrangement? (Please tick as appropriate)

Customary	
Freehold	
Leasehold	

22. What size of land do you own? (Please tick as appropriate)

1	Land≤50 decimals (half-acre)	
2	Land ≤100 decimals (one acre)	
3	Land ≤200 decimals (two acres)	
4	Land ≤500 decimals (five acres)	
5	Land ≥550 decimals (five and half acres)	
6	Other (Specify)	

H. Distances to COMSIP Office

23. How far do you stay from COMSIP local office?

1	≤1Km	
2	1.5 Km≤3Km	
3	3.5 Km≤5Km	
4	5.5 Km≤8Km	
5	≥8.5 Km	

Interviewer Name:……………………………Signature…………………………………

Date of Interview…………………………………Signature…………………………………

Supervisor Name…………………………………Signature…………………………………

Date of Approval by Supervisor……………………………………………………………………

Appendix G: Checklist for Key Informant Interviews

1. Interview the Key Informants on the specific information regarding:

    (i) Number of COMSIP activities/enterprises.

    (ii) Number of members per COMSIP group.

    (iii) Location of local COMSIP offices.

    (iv) Existence of other credit and savings groups.

    (v) Number of COMSIP groups per TA.

    (vi) Villages where there are no COMSIP or other credit and savings programs and non-COMSIP program villages.

2. Are COMSIP groups formed at TA, GVH or VH level?

3. What is actually the eligibility criterion for a household to join a COMSIP group and start accessing credits and other COMSIP activities?

4. What are your perceptions regarding the benefits of COMSIP program to the communities per se the rural poor masses?

5. What do you think are the factors that influence household decisions to join the COMSIP groups?

Appendix H: Checklist for Focus Group Discussions (FGDs)

1. What is your primary occupation as a household head?

2. What are you major sources of household incomes?

3. If you are a member of COMSIP group, what factors influenced you to join the group?

4. Do you engage in any enterprises or invest after credit acquisition? If yes, what type of enterprises do you engage in?

5. Do you apply fertilizers on you farmland during the planting season? If yes, how do you access fertilizers? If no, why?