

# **DETERMINANTS AND CHARACTERISTICS OF HOUSEHOLD DEMAND FOR SMALLHOLDER CREDIT IN MALAWI**

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## **Abstract**

It has been argued that most of Malawi's smallholder farmers are too poor to benefit from any kind of credit, and that, even if they had access to adequate credit and inputs, their land constraints are so severe that any increase in productivity would fall short of guaranteeing their food security. The underlying objective is to analyze the factors that affect household demand for credit. The aim is to provide a better understanding of the households' personal characteristics, not only because they influence the household's demand for credit but also due to the fact that potential lenders are likely to base their assessment of borrowers creditworthiness on such characteristics. The study covered 404 households in Nkhotakota, Rumphu, Dedza, Dowa and Mangochi. The analysis was conducted using three methods, first, descriptive analysis to determine the relationship between participation in credit markets and socio-economic characteristics. Secondly, an Ordinary Least Squares estimation of the extent of credit demand and finally, a probit analysis. Estimated coefficients for family size and seasonality (post-harvest, post-harvest and harvest periods) were positive and significantly different from zero at  $p < 0.01$ . Family size is positively and significantly related to the household's probability of participation. Larger family size exerts (consumption) stress on the household, which is mostly reflected through an increased probability of borrowing. Furthermore the signs of seasonal dummies (pre harvest, harvest and post harvest) suggest that the probability of household borrowing increased in each of the seasons. The number of livestock owned by the household was found to be negative and not significantly different from zero. This negative relationship is due to the fact that livestock is a highly liquid asset, thus households tend not to borrow when their livestock value is substantial, since they can sell off their livestock when they are in need. It was concluded in the study that providing financial services to the rural poor must be an integral component of any development policy. The study has indicated that sustainable financial institutions offers credit not only for agricultural production, but also for consumption smoothing and income diversification as well as the provision of savings option.

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## 1.1 Economic Policy and Food Security in Malawi

In Malawi the achievement and maintenance of food security, import substitution and foreign exchange earnings will continue to depend on increased agricultural production. About 56% of Malawi's farming households are engaged primarily in subsistence production on smallholdings of less than 1.0 hectare per household (Government of Malawi, 1994).

## 1.2. Importance and Significance of Credit to Poverty and Food Security

The conceptual framework for analyzing the role of credit is provided by a model which defines the household economic portfolio as 1) the set of household resources (human, physical, and financial); 2) the set of household resources and household activities (consumption, production, and investment); and 3) the circular flow of interaction between household resources and household activities. Households allocate their resources to a set of consumption, production, and investment activities which, in turn, act to satisfy current household wants and needs while returning resources to the household for use in future periods (Figure 1)

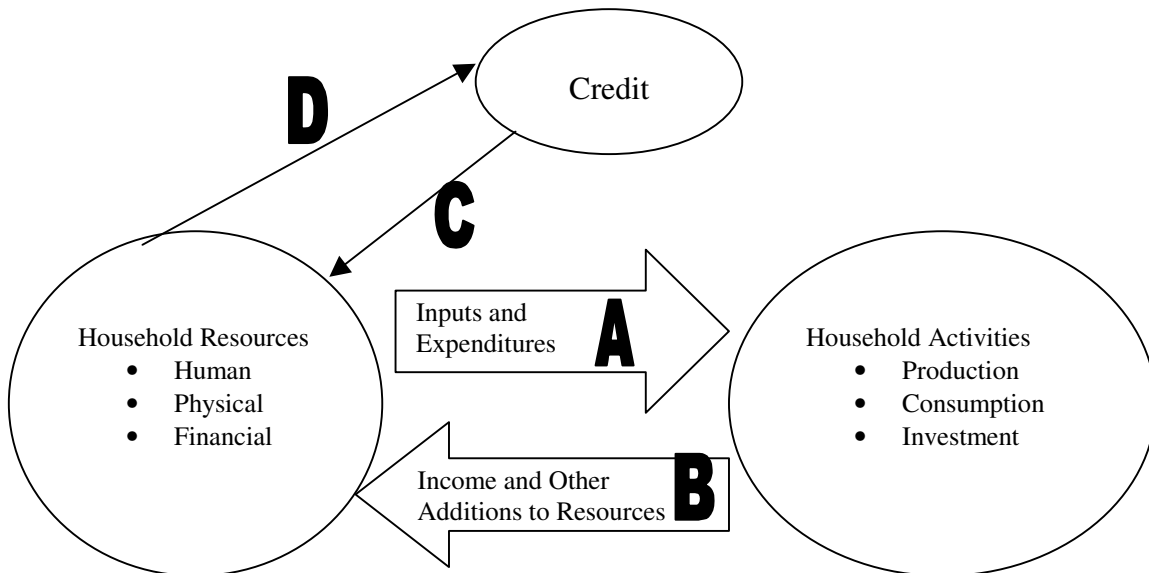


Figure 1: Conceptual Model of the Household Economic Portfolio

The conceptual model of the household economic portfolio can be used to clarify the role of credit in the household economy. When credit is received, there is an addition to the set of resources that are available in current time period for support of the household's activities. In Figure 1, C, a flow from the credit to household resources, denotes this addition. By augmenting household resources, the credit increases the potential flow of resources to activities (A), thus increasing the household's options in selecting activities. On the other hand, repayment of the loan implies that some portion of the household's resources will flow out of the household economy and back to the lender. D in Figure 1 denotes this outflow from the household's resource base. The repayment capacity of the household is linked to the flow of income and other resources that are generated by the household's activities (B). If the household has used the addition to resources provided by the loan to increase production or investment activities, then there may be an increase in the size of the resource flow coming out of the household's activities. If the addition to resources provided by the loan is allocated to consumption activities does not directly increase repayment capacity, it may indirectly play an important role in protecting the productivity capacity of the household.

Credit improves transitory and chronic food security in three ways. First, credit provides capital for financing inputs, labor, and equipment for income generation. This is the traditional argument for rural financial policy. Second, credit (that can be readily converted to cash) helps households to increase their capacity to bear risks or reduce the cost of insurance. This encourages households to invest in new, more risky, but also more profitable enterprises and asset portfolios, including build-up of human capital through education for example. Third, improved financial services stabilize consumption of food and other essential goods more efficiently than existing informal services do.

### **1.3 Access to Credit**

The poor have little or no collateral and the required amounts and installments are small, the transaction costs are high and formal lenders are discouraged to extend credit

to them. As a result, informal credit sources also provide most of the consumption credit to the poorer households (Zeller 1993). Smallholder credit has a direct link to food security, which ties in with a household's nutrition and health status.

Access to consumption credit as observed by Eswaran and Kotwal (1989) is based on difference in risk behavior of households. It has also been found that poorer households get excluded from the formal credit (Basu 1989; Biswanger and Sillers 1983; Malik 1989; Rao 1970) due to lack of collateral, long and complicated processing, and physical inaccessibility. On the other hand, informal markets, which consist of credit from merchants, relatives and friends, are more easily attainable particularly to the poorer households.

Nankumba (1989) reported that strict conditions for acquiring fertilizers on credit, removal of fertilizer subsidies and the establishment of estate farms were factors impinging on the smallholder attempt to improve their incomes. Zeller found that the number of formal loans obtained by men or women in Madagascar increase significantly with increase in household income. He concluded from his econometric analysis that easing liquidity constraint through credit also increases returns on human capital, a production factor which he judges as the most important in the majority of poor smallholder households.

Oxfam (1987) observed that in the formal institutions, credit uptake by the poor has been low or non-existence. There are several reasons, which contribute to poor access to formal credit for small borrowers. First, it is very difficult to access credit in formal finance institutions because of the conventional collateral requirements against credit. The poor usually lack productive resources and have no property rights and are therefore not able to provide the collateral in order to gain access to credit to finance their small business ventures. Second, the cost of borrowing is very high and unbearable in formal credit markets.

## **1.4 Factors influencing Access and Repayment of Credit**

Nurah (1993) in Ghana observed that the development effects of agricultural credit tend to be exaggerated and that even where credit increases productivity, it does not necessarily increase family incomes. In Nigeria, Mbata (1991) noted that those who had access to the formal sources consumed more inputs, obtained higher yields and thus realized greater gross margins per hectare than their counterparts who obtained credit from informal sources. However, as in many credit impact studies, Mbata did not control his analysis for other factors that can influence the results. For example, those who borrow formal credit, may have more land, are better educated, live closer to markets than those households who only borrow from informal sources.

Even though much focus and study on rural credit has been production related, a greater proportion of loans taken in rural communities have been for consumption purposes (Roth 1993), especially during the pre harvest period and bad production seasons. The seasonal food security stress that rural agrarian households experience leads to a credit seasonality trend. Although farmers prefer to hold physical production assets as savings, they also rely on external credit at various times borrowing during the pre-harvest period and paying back at post harvest (Deaton 1991).

In the past development of financial markets was based on the assumption that low income groups, mainly found in rural areas, are too poor to be able to save and lack the necessary collateral for obtaining credit. As a consequence, the poor were almost entirely ignored in the design of policies pertaining to financial markets (Von Braun *et. al*, 1993). Recent experience shows that low income groups often have substantial savings potential ( Seibel 1985).

## **1.5. Policy Interventions in Credit Markets**

Interventions in rural financial markets in less developing countries have become a worldwide development issue. There are many justifications for government/donor

interventions in rural finance. It is argued that in most developing countries the competitive market fails to bring about efficient allocation of credit, and hence government interventions may be justified (Besley, 1994).

Interventions in rural finance markets in Malawi have had no policy basis prior to 1995. The two earlier Statements of Development Policies 1975-1986 and 1987-1996 did not have strategies on how the poor will be assisted and poverty alleviation was not a central focus for development plans. In any case, there has been no general framework for interventions in the rural financial markets. Interventionist policies were therefore ad hoc and targeted to limited areas.

The Government of Malawi/UNICEF (1993) report and many other studies have provided a basis for the development of a policy framework for poverty alleviation. In 1995 the Malawi Government published the Policy Framework for Poverty Alleviation Program (PAP). Some of the strategies in poverty alleviation centered on the provision of credit facilities to the poor, according to the Malawi Government (1995) the strategy for PAP include:

- Promoting increased participation of poor women and youth in economic, social and political affairs by the provision of basic services that enable them to take advantage of opportunities
- Economic empowerment of the poor by promoting the more productive use of their abundant resource namely, labor, which is underemployed
- Improving the poor's access to credit facilities by deepening and broadening the financial sector to assist the poor to diversify their sources of income

The strategy on the provision of credit facilities in PAP emphasizes the promotion of micro and small enterprises and informal sector whose activities are seldom licensed or registered, unregulated and undertaken on self-employment basis.

## **1.6 Rationale of the study**

In the past few years Malawi has seen the emergence of various credit schemes targeted at the rural population in addition to the already existing programs. The schemes focus on credit needs instead of credit demand resulting in supply led subsidized, supervised and narrowly defined production credit.

Previous studies in Malawi, Nankumba, 1980; Reeser, Biden, Hoben and Hobgood, 1989; focused on the supply side of the credit markets. Reeser *et. al.*, 1989; and Msukwa *et. al.*, 1994 focused on the organizational, management and operational structures of the available credit programs. In all these studies, the issue of determinants and characteristics of household demand for credit was not addressed.

The study of the determinants of credit market participation is, therefore, important due to its implications on food security and its linkages to consumption and production. It has been shown by Esawaran and Kotwal (1989) and Feder (1990) that credit is indeed productive and economical and positively impacts on production behaviour of smallholder farmers. Thus, there is need for an empirical study to analyze the factors that determine a household's participation in the credit market.

## **1.7 Objectives of the Study**

The underlying objective is to analyze the factors that affect household demand for credit. The aim is to provide a better understanding of the households' personal characteristics, not only because they influence the household's demand for credit but also due to the fact that potential lenders are likely to base their assessment of borrowers creditworthiness on such characteristics.

### **1.7.1 Specific Objectives**

- i) To develop a micro level econometric model to explain the factors affecting household participation in the credit market
- ii) To identify the underlying determinants of the occurrence of participation and its extent

### **1.8 Hypotheses**

The study will attempt to answer the following hypotheses from which policy implications will be drawn.

- i) Credit from formal lenders is used for production purposes
- ii) Demand for credit has a seasonal pattern
- iii) Informal lender provide the bulk of consumption credit

## **2.0 METHODOLOGY AND ANALYTICAL TECHNIQUES**

### **2.1 Methodology and Data**

The study was based on data collected by the Department of Rural Development (DRD) of Bunda College of Agriculture in collaboration with the International Food Policy Research Institute (IFPRI) during the 1994/95 agricultural season. The sample size was 404 smallholder households that were purposefully selected. In order to have meaningful statistical analysis, a sufficient number of households participating in the credit programs operating in various parts of the country were required. However credit program participation was a rare reality found in few selected villages (Diagne, Zeller and Mataya 1995). Given this, a feasible alternative to include enough formal credit participants was to stratify along the program membership status variable with random sampling within the strata. The explanation also applies to the selection of the districts where the survey took place. The sites were chosen from those areas in which the four

main credit institutions that serve rural households in the country were operating. The districts selected were Mangochi, Nkhotakota, Dowa, Dedza-Linthipe and Rumphu. In these areas, financial institutions of interest, i.e., Malawi Mudzi Fund (MMF), Malawi Union of Savings and Credit Cooperatives (MUSCO), Malawi Rural Finance Company (MRFC) and Promotion of Micro-enterprise for Rural Women (PMERW), were operating.

## **2.2 Analytical Framework**

The analysis was conducted using three methods, first, descriptive analysis to determine the relationship between participation in credit markets and socio-economic characteristics. Secondly, an Ordinary Least Squares estimation of the extent of credit demand and finally, a probit analysis.

The analysis uses several dichotomous (dummy) variables that have been modeled using an analysis of covariance model. These are regression models that contain a mixture of quantitative and qualitative variables. The probit model has been used to model dichotomous dependent variable such as participation in the credit market.

The basic idea underlying a probit model is the normal cumulative distribution function. The normal probability function is the best known of all theoretical probability distributions. In the multivariate probit analysis, although Ordinary Least Squares (OLS) method can be used to estimate the parameters for binary choice models (with response, yes or no), it is likely that certain classical assumptions of regression models will be violated, error terms will not be homoskedastic and thus inefficient parameter estimates will be obtained resulting in t-ratios that are inappropriate.

Alternatively probability models are used. However, one cannot use the Linear Probability Method because predicated values may fall outside the (0,1) interval thereby going against the basic tenets of probability. In order to overcome this most researchers use the logit and probit models (Pindyck and Rubinfeld, 1991). These models use the Maximum Likelihood Estimate procedure and have a number of desirable statistical

properties; all parameter estimates are consistent, efficient and asymptotically normal so that the analogy of the t-test in regression is applicable. The t-ratio (estimated coefficient/estimated standard error) follows the normal distribution and the chi-square test replaces the F-test when testing the significance of the model parameters.

The probit model has therefore been adopted for this study because it is easier to compute and interpret and also that it is very convenient particularly in estimating the equation for the probability of participating in the credit market. The estimation of the subsequent equation was done by OLS.

The explanatory power of the regressors shall be tested using R-Squared adjusted values.

## **2.3 Specification of Credit Participation Function**

### **2.3.1 Probit Regression Analysis**

The probit model used to estimate participation includes the following independent variables:

Participation was presented by the equation below:

$$Y = f(X_1, X_2, X_3, X_4) \quad (1)$$

Where

- Y = The probability of participating in the credit market (1=yes, 0=no).
- X<sub>1</sub> = Formal Education of Household head (1=yes, 0=no).
- X<sub>2</sub> = Per capita land owned in hectares.
- X<sub>3</sub> = Number of animals owned by household.
- X<sub>4</sub> = Size of household.

### 2.3.2 Estimation of the Extent of Credit Demand

The study also estimated the significance of the various variables in determining the extent of borrowing on all valid credit transactions. Variables used in the analysis are as follows;

$$Y = f(X_1, X_2, X_3, X_4, X_5) \quad (2)$$

Where

Y	=	Total loan value received (MK)
X <sub>1</sub>	=	primary occupation of borrower (1=farming, 0=otherwise)
X <sub>2</sub>	=	size of household.
X <sub>3</sub>	=	farmer took input credit (1=yes, 0=no).
X <sub>4</sub>	=	farm expenditure
X <sub>5</sub>	=	sex of household head (1=male, 0=female)

### 2.4 Survey Design

The villages surveyed had been randomly selected in each district from all the villages that had access to at least one of the above four mentioned programs. About half the households randomly selected were those presently receiving credit. Thus, the survey sampled PMERW (90 participants), MRFC (60 participants), MUSCO (30 participants) and Malawi Mudzi Fund (30 participants). The other half were households not presently receiving credit from any institutions although about half had previous access to Smallholder Agricultural Credit Administration (SACA) loans (Diagne et al 1995). In order to control for community driven effects, the control groups, i.e. non participants were randomly selected from the same village as participants.

### 2.5 Selection of Sample Households

The information about the villages in which the four credit programs were operating, was sought at the national headquarters and district offices of the credit institutions.

This was followed by a village reconnaissance survey before a sample frame of villages hosting the present members from each credit program selected for the study and from which the village and household sample was drawn subsequently. The second step was to brief the district administrative and village leaders about the purpose of the study. The selection of the area was based on location of the clubs. After informing the community about the purpose of the survey the next step was to carry out a village census. This consisted of taking a list of all households with information on whether a household was a present member or a past member of a credit program. The procedure was the same except for Linthipe in Dedza where a multi-stage sampling was used. That is, MRFC office in Linthipe was randomly selected from the list of field offices at the headquarters followed by selection of four clubs from the list of the MRFC clubs in Linthipe EPA. Thereafter the procedure was the same as for the other areas. (Diagne et. al., 1995).

### **3.0 EMPIRICAL RESULTS AND DISCUSSION**

This chapter analyses the survey's credit market sources as well as the borrowers credit uses and the cost of borrowing. This study will feed into the discussion of the determinants and extend of credit market participation in Chapters 4 and 5.

#### **3.1 Characteristics of the Households**

Credit market participation would depend on households' personal characteristics such as sex of household head, marital status, educational level of household head, age of participant and landholding size. These characteristics are important for two reasons. First, they influence the household's demand for credit. Second, potential leaders are likely to base their assessment of borrowers' credit worthiness on such characteristics.

Depending on the social and economic context, men and women are seen to engage in separate or joint economic activities (or some mix thereof) and to move in and out of the commodity and noncommodity sectors to varying degrees. These divisions within an

economy-commodity and noncommodity, male and female- interact in different ways to help generate as well as smooth consumption. Table 1 below highlights participation in the credit market by sex of household head.

**Table 1: Loan Category by Sex of Household Head**

	ALL	INFORMAL	FORMAL		
	n	n	%	n	%
Male	225	65	28.9	160	71.1
Female	77	28	36.4	49	63.6
Total	302	93	30.8	209	69.2

Chi-Square=1.5

Not significant at  $p < 0.05$

Most of the participants were male-headed households. The majority of the households participated in the formal markets (69.2%). The table also shows that even within both categories of household headship it is in the formal markets where there is much participation (71.1% for male headed and 63.6% for female headed households).

Researchers have highlighted several socially defined categories or identities in addition to gender (such as seniority, age, marital status), which cross cut and divide the community. Individuals are seen as belonging to one or more of these constituent categories. Such categories frequently carry with them assemblance of rights and responsibilities, defined by law or expectation, which govern individual access to and use of resources as much or more than membership *per se* in the community.

Age is important in the credit participation because most credit institutions lend to the economically active group. This is normally due to the fact that most people get credit for productive purposes. Table 4 presents the age category of households participating in the credit market.

**Table 2: Age Category of Household Heads**

	ALL		INFORMAL		FORMAL	
	n		n	%	n	%
20-40 years	114		36	31.6	78	68.4
41-60 years	149		46	30.9	103	69.1
60 years and Older	39		11	28.8	28	71.8
Total	302		93		209	

The study results show the majority of the households were in the age of 20 to 60 years implying that these age groups were actively involved in economic activities, *ceteris paribus*. This is also supported by the overall average age, which is at about 46 years. Statistics in Table 2 indicates that a large proportion of household heads in the 20-40 years age group (68.4%) , in the 41-60 years age group (69.1%) and in the 60 years and older (71.8%) were participating in the formal loan market.

In most cases education is described as an essential element in any development endeavor. It is argued that educated people can understand agricultural instructions very easily and be able to take advantage of innovations and opportunities. High education level is also essential when it comes to understanding formal credit requirements. Level of education of the household was compared among the formal and informal credit market participants to reflect borrowers understanding of the credit requirements. Table 3 below shows the results.

The majority of the respondents had attended formal school up to Standard 5 (Junior Primary level) and as such was able to read and write, 41.9 % for the informal market and 51.2 % in the formal credit market. The table shows that for both the informal and formal credit market, participation of those that had attained junior secondary education was very low (5.4% and 3.8% respectively). There were only a small proportion of participants in both credit markets that had attained the Malawi School Certificate of Education (3.2% in the informal market and 2.4% in the formal market).

**Table 3: Education of Household Head and Loan Category**

	ALL	INFORMAL		FORMAL	
	n	n	%	n	%
No Education	67	16	17.2	51	24.4
STD 1-5	146	39	41.9	107	51.2
STD 6-8	68	30	32.3	38	18.2
JC	13	5	5.4	8	3.8
MSCE and above	8	3	3.2	5	2.4
Total	302	93	100	209	100

Land is one of the human capital indicators and in most cases it is the principal asset of rural households. The analysis of demand for credit cannot be done independently from the possession and size of land (Table 4).

The majority of the households had landholding sizes, as reflected by the average as well as the proportion of households, of at least 1.5 ha (Table 6). The results show that in the formal market, a higher percentage (27.9%) had holdings in the 1-1.5ha category while for those in the informal market, many participants (26.9%) had 2-3 hectares.

**Table 4: Landholding Size and Loan Category**

	ALL	INFORMAL		FORMAL	
	n	n	%	n	%
Less than 0.5 ha	11	4	4.3	7	3.4
0.5-1.0 ha	41	14	15.1	27	13.0
1-1.5 ha	81	23	24.7	58	27.9
1.5-2.0 ha	46	16	17.2	30	14.4
2-3 ha	72	25	26.9	47	22.6
Over 3 ha	50	11	11.8	39	18.7
	301	93	100	208	100

### 3.2 Credit Characteristics

Credit can be part of a strategy for increasing current income, investing in the future, or coping with crises. Institutions offering credit introduce a new source of credit where the use of credit may already be widespread. In order to develop a better understanding the relationships between credit markets and the households, this section examines the characteristics of credit of different types and the use of credit in the household.

During the survey period, it was found that 75% of the households had borrowed from credit markets with a total of 302 credit transactions taking place. The sections below will examine the sources and uses of the credit. Formal lenders usually discourage borrowers from using loans for consumption purposes. Because formal lenders discriminate against consumption credit, but also because of differences in loan sizes, the use of loans obtained by a household is usually dependent on the source and related loan characteristics.

#### 3.2.1 Sources of Credit

Credit can be obtained from a number of sources, which are generally classified as either formal or informal. Rather than falling clearly into two distinct categories the sources of

credit can actually be thought of as existing on a continuum. This section looks at the major sources of household credit in the study. The borrowers obtained loans from different submarkets (Table 5).

**Table 5: Sources of Credit**

Sources of Loan	Number	Mean Volume (MK)	%	Total Volume (MK)	% From Total Disbursement
<b>Formal Sources</b>					
MRFC/SACA	108	785.81	35.80	84,867.48	38.18
Malawi Mudzi Fund	25	753.28	8.30	18,832.00	8.47
MUSCO	13	521.50	4.30	6,779.50	3.05
PMERW1	42	626.24	13.90	26,302.08	11.83
PMERW2	20	1,947.70	6.60	38,954.00	17.53
Other NGOs	1	225.00	0.30	225.00	0.10
<b>Sub Total</b>	<b>209</b>	<b>841.91</b>	<b>69.20</b>	<b>175,960.0</b>	<b>79.16</b>
				<b>6</b>	
<b>Informal Sources</b>					
First Degree relative	27	402.58	8.90	10,869.66	4.89
Friend	42	657.88	13.90	27,630.96	12.43
Other Relative	18	366.43	6.00	6,595.74	2.97
Neighbor	3	179.28	1.00	537.84	0.24
None of the above	3	227.28	1.00	681.84	0.31
<b>Sub Total</b>	<b>93</b>	<b>498.02</b>	<b>30.80</b>	<b>46,316.04</b>	<b>20.84</b>
<b>All sources</b>	<b>302</b>	<b>736.01</b>		<b>222,275.0</b>	<b>100.00</b>
			<b>169.20</b>	<b>2</b>	

More than 79% of the of the loan disbursement in the survey villages came from the formal sources, mainly from MRFC/SACA which accounted for about 38% of the total loan disbursed, followed by PMERW2 (about 18%). Other Non Governmental Organizations (NGOs) appear to play a minor role in credit disbursement, probably due to the logistical constraints and level of funding. The notable sources of informal credit markets were friends with about 12% of the loans disbursed, followed by first degree relatives with about 5% of the total loans disbursed.

Where credit transaction has taken place, the mean amount of loan is MK736.00. As can be seen in Table 5, the bulk of the total loan disbursement comes from the formal sources (where MRFC dominate), followed by PMERW2 and friends. The formal credit institutions advance a larger loan amount on average (MK842.00) than the informal credit institutions (MK498.00). This conforms to other studies where it is found that the formal lenders prefer to lend higher amounts of money to cut down transaction costs.

The findings in this study do not conform to other credit studies in Least Developing Countries where the informal sector provides the bulk of the disbursed credit vis-a-vis the formal market's credit allotment both in volume and number of credit advanced (Adams, 1989, Deaton, 1991, and Zeller 1993). Results from these studies indicate that high informal market participation is due to the following factors; ease of entry/exit, operation being outside government/central bank's control, high flexibility, physical proximity, and first-hand knowledge of the lenders and borrowers cutting down on transaction (including information gathering) costs.

Most formal credit institutions provide credit for productive purposes and this is mostly provided in kind while informal credit sources normally lend for consumption and in cash. An analysis of the types of credit offered becomes important when one considers the fact that productivity of a household economy depends not only on conventional production inputs and durables, but also on the skills, education, and nutritional and health status of its family labor. Therefore the use of credit for maintaining and enhancing human capital

can be highly productive. Since cash is fungible within the household economy improved access to credit has the potential to affect all linkages between investment, production and consumption.

**Table 6: Loan type by Source**

	Cash		In kind		Both	
	N	%	n	%	n	%
Informal market						
First degree relative	18	66.7	1	3.7	8	29.6
Friend	25	59.5	3	7.1	14	33.3
Other relative	6	33.3	2	11.1	10	55.6
Neighbor	2	66.7	0	0	1	33.3
Other	1	33.3	1	33.3	1	33.3
Sub Total	52	17.2	7	2.3	34	11.3
Formal Market						
MRFC/SACA	4	3.7	85	78.7	19	17.6
Mudzi Fund	25	100	0	0	0	0
MUSCO	2	15.4	11	84.6	0	0
PMERW1	41	97.6	0	0	1	2.4
PMERW2	20	100	0	0	0	0
Other	0	0	1	100	0	0
Sub Total	92	30.5	97	32.1	20	6.6
Grand Total	144	47.7	104	34.4	54	17.9

Credit is incurred from a number of sources, both formal and informal. The contrast between the formal and informal sources can be at least partially understood by examining the differences in the terms of credit. Table 6 examines the types of loans disbursed by the different sources of credit in the survey.

The findings indicate that (Table 6) the majority of the loans disbursed were in cash (48% of the total disbursed), except for MRFC/SACA and MUSCO lending with about 79% and 85% of the lending given in kind respectively (primarily for inputs). This is mainly because these two institutions provide credit for inputs in specific packages in order to avoid the problem of providing cash to the borrowers which could then be used for other purposes that what the institutions would provide the loan for.

### **3.2.2 Uses of Credit**

Credit is an important component of household livelihood strategies. Households may borrow for a variety of purposes, including investing in productive purposes, to accumulate assets or deal with unexpected contingencies and interruptions of income. Borrowing is also intended to meet daily or seasonal needs of households. Due to the fungibility of credit, the data on uses of credit need to be interpreted with caution. This section examines how households utilize credit in terms of district, gender, sources of credit and borrowing periods (seasonality).

Borrowers engage in credit financing to meet multiple goals. Credit breakdown by uses, given in Table 7 indicate that borrowers accord the highest priority to agricultural inputs before other uses in both Volume MK101,372.34 and number of transactions (41.4%) of the loans disbursed. This is not surprising considering the fact that the majority of the rural population in Malawi depend of farming for their livelihood and that many of the two million smallholders are food insecure. Therefore, provision of credit could help prevent both transitory and chronic food insecurity by enabling households to acquire inputs to generate more food.

**Table 7: Mean Volume (MK) by Loan Use**

	Mean Volume (MK)	n	%	Total Volume (MK)
Agriculture inputs	810.98	125	41.1	101,372.34
Inputs for IGAs	811.36	94	31.1	76,267.70
Food Consumption	600.50	48	15.9	28,825.24
Non food consumption	495.31	30	9.9	14,859.35
Other uses	190.36	5	1.7	951.80
<b>Total</b>	<b>736.01</b>	<b>302</b>	<b>100</b>	<b>222,276.43</b>

Theoretical evidence suggests that formal credit markets concentrates on lending for productive uses, while the informal sector focuses on consumption loans. The argument for formal institutions is that credit should be used for income-generating activities in order to ensure repayment. Table 12 disaggregates the loan use by loan source to ascertain the argument above.

**Table 8: Loan Use by Sources**

	Agric inputs	IGA inputs	Food consumption	Non Food consumption	Other Uses
	%	%	%	%	%
<b>Informal market</b>					
First degree relative	1.3	2.6	3.3	0.3	1.3
Friend	2.0	2.0	5.0	5.0	0
Other relative	1.7	2.0	1.3	1.0	0
Neighbor	0	0.7	0.3	0	0
Other	0.3	0	0.3	0.3	0
<b>Sub Total</b>	<b>5.3</b>	<b>7.3</b>	<b>10.3</b>	<b>6.6</b>	<b>1.3</b>
<b>Formal Market</b>					
MRFC/SACA	31.1	0.7	2.6	1.0	0.3

Mudzi Fund	0.3	6.6	1.3	0	0
MUSCO	4.0	0	0	0.3	0
PMERW1	0	11.3	1.3	1.3	0
PMERW2	0.3	5.3	0.3	0.7	0
Other	0.3	0	0	0	0
<b>Sub Total</b>	36.1	23.8	5.6	3.3	0.3
<b>Grand Total</b>	41.1	31.1	15.9	9.9	1.7

As can be seen in Table 12, the formal sources lend primarily for purchase of inputs (36.1%), while the informal sources essentially lend for purchase of food (10.3%). This is consistent with studies that have demonstrated that formal credit institutions concentrate on lending for productive uses, while the informal sector focuses on consumption loans.

### 3.3 Seasonality Patterns in Use of Credit

Agriculture is the major source of income for the majority of the smallholder households in Malawi, whether they are directly or indirectly involved in farming. Farming in Malawi follows a seasonal pattern and because of that income is seasonal and highly variable. Thus use of credit has a seasonal pattern that follows the farming season, Table 9 presents the analysis of loan use and seasonality of that loan use.

**Table 9: Seasonality by Loan Use**

	Planting	Pre harvest	Harvest	Post harvest
	%	%	%	%
Agriculture inputs	62.1	21.8	8.3	66.2
Inputs for IGAs	25.8	33.3	50.0	28.6
Food Consumption	7.6	26.5	16.7	2.6
Non food consumption	3.0	16.4	25.0	1.3

Other uses	1.5	2.0	0	1.3
Total	100	100	100	100

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Loans for agricultural input purposes occurred mostly in the planting and post harvest period. Out of the total number of loans disbursed before planting agricultural input loans constituted 62.1% while in the post harvest period they constituted 66.2%. Borrowing for food consumption while spread throughout the season was very low in the planting and post harvest periods (only 7.6% in the planting period and 2.6% in the post harvest period), but rose up sharply in the pre harvest season (26.5%) when food consumption shortfall is at its highest. This indicates a clear seasonality pattern, vis-a-vis borrowing that follows the agriculture production cycle.

#### **4.0 DETERMINANTS OF CREDIT MARKET PARTICIPATION**

This chapter analyzes the extent of credit market participation in the study, and identifies participation determinants in terms of household, district and seasonal characteristics with a special focus on food security issues. Determinants of participation in the credit market are very important due to the role that credit plays in the household's economic portfolio. When a household participates in the credit market, it provides additional resources for support of the household' activities in the current time period. At the same time, the credit represents a claim on household resources in future time periods. The additions to resources made available from credit are fungible in the sense that, once they enter the set of household resources, they become indistinguishable from existing resources. Therefore, the study of the determinants of credit market participation is important if the impact of credit market participation is to be enhanced.

##### **4.1. Probit Regression Analysis**

This section provides a statistical analysis of the factors determining participation by running a probit regression analysis (Table 24). Credit transactions are expected to be

influenced by households' personal characteristics such as education of household head, family size, number of livestock owned and land holding size. These characteristics are important for two reasons. First, they influence the households' demand for credit. Second, potential lenders are likely to base their assessment of borrowers' credit worthiness on such characteristics.

Participation in credit markets was analyzed using dummy dependent variable with 1 designating the household that borrowed, 0 otherwise. Area (district) dummies were included to accommodate care of the different agro-ecological and socio-economic conditions. Dummies for seasons (pre planting, planting, harvest, and post harvest) were also included to capture the seasonality aspect of borrowing.

A priori, human capital indicators (education, family size and land holding size) are expected to positively influence the household's probability to participate in the credit market. The number of livestock owned is expected to reduce the probability of participating in the credit market, since the farmer can smooth income shortfalls through sales of livestock.

**Table 10: Probit Analysis of Determinants of household's Participation in Credit Market**

Variable	Coefficient	T-Statistic
Constant	1.2370	18.535***
Education	0.0416	0.073
Land size owned	-0.0033	-0.076
Livestock Number	-4.4209	-0.275
Family size	0.0202	2.724***
Dedza dummy	0.0342	0.727
Rumphi dummy	0.0021	0.043
Khotakota dummy	0.0018	0.036
Dowa dummy	0.0738	1.349
Harvest dummy	0.5841	6.098***

Post harvest dummy	0.6120	13.793***
Pre harvest dummy	0.6050	16.124***

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Notes: Dependent is dummy variable: 1 if participated in credit market, 0 if not. n=404  
 \*\*\*Shows significance at  $p < 0.01$ ; \*\*shows significance at  $p < 0.05$ ; Adjusted R-squared=0.69

Estimated coefficients for family size and seasonality (post-harvest, post-harvest and harvest periods) are positive and significantly different from zero at  $p < 0.01$ . Family size is positively and significantly related to the households. Larger family size exerts (consumption) stress on the household, which is mostly reflected through an increased probability of borrowing. Furthermore, the signs of seasonal dummies (pre harvest, harvest and post harvest) suggest that the probability of household borrowing increased in each of the seasons.

The estimated coefficient for education was positive while those for land size and livestock owned were negative. However, all these were not significantly different from zero. This means that there is a no relationship between land sizes owned and credit market participation of a household. This could be a result of the fact that while land is not a highly liquid asset; the households can rent it out for cash in times of need and thereby reducing the household's probability to participate in the credit market.

The number of livestock owned by the household was found to be negative and not significant. This negative relationship is due to the fact that livestock is a highly liquid asset, thus households tend not to borrow when their livestock value is substantial, since they can sell off their livestock when they are in need.

The estimated coefficients for district dummies are not significantly different from zero. This reflects that the household probability to participate in the credit market was not influenced by these variables. The constant term has been shown to be significantly different from zero in the analysis indicating that there might be other additional factors that affect household participation in the credit markets, which have not been modeled in

this analysis. This is further reflected in the R-square, which is showing that the model is explaining only 69% of the variation in the household participation in credit markets. Nevertheless this value shows a sensible as well as high degree of adequacy of the model in analyzing household participation in credit markets.

## **5.0 THE EXTENT OF CREDIT MARKET PARTICIPATION**

### **5.1 Credit Market Participation**

In addition to understanding the factors that determine a household’s participation in the credit market, there is also need to understand the factors that affect the credit volume demanded. This will help in designing credit institutions that are responsive to the demand of the borrowers. This chapter looks at various characteristics like sources and uses of credit, seasonal trends in determining the extent of credit transactions/volume.

### **5.2 Determinants in the Extent of Household Credit Participation**

There are some discerning characteristics in terms of the extent of borrowing in credit participating households. This section identifies these household attributes that influence the volume of credit transactions. Participating households borrowed an average of MK736.01 during the study period.

**Table 11: Mean Amount Borrowed by Socio Economic Characteristics (MK)**

Characteristics	Mean Amount Borrowed	no. of cases
All Participants	736.01	302
<b>Food Credit</b>		
Food credit Borrowers	604.37	47
Non Food Credit Borrowers	760.28	255
<b>District</b>		
Dowa	461.48	36

Mangochi	694.91	85
Nkhotakota	1133.17	52
Rumphi	521.99	57
Dedza	804.42	72
<b>Head of Household</b>		
Male	768.19	225
Female	642.00	77
<b>Per Hectare Farm Expenditure</b>		
Less than MK500	668.32	276
Between MK500-1000	1426.33	20
Greater than MK1000	1458.84	5
<b>Modern Inputs</b>		
Used modern inputs	819.47	187
Not used modern inputs	600.31	115
<b>Family Size</b>		
Low (up to 6)	604.76	193
Medium/high (more than 6)	968.41	109
<b>Per Capita Income</b>		
Low (less than MK500)	606.60	228
Medium (up to MK1000)	979.00	31
High (more than MK 1000)	1247.07	43
<b>Borrowing season</b>		
Planting	528.19	66
Prep harvest	847.65	147
Harvest	733.10	12
Post harvest	701.49	77

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From Table 11, it is found that Mangochi had a high percentage of credit market participants as compared to the other districts. However, on average Nkhotakota registered the largest loan size (MK1,133.17). It is also noted that family size and per capita income affect the mean volume of credit positively. The higher the income and

family size, the more the household borrows. Credit needs, especially vis-avis consumption, increases with family size. Moreover, creditors are more likely to lend to relatively larger households.

Modern input use also affects the extent of credit; households that took out input credit borrowed more than those who did not. Families who in general use modern inputs, purchased from either own pocket or from input credit, borrowed on average 1.4 times as much versus those who did not (Table 11). Thus, there is a positive association between input use and average borrowing amount. The difference is more apparent when households distinctly borrowed for inputs (inputs are relatively expensive).

In addition, the more farmers invest on their land (measured on per hectare basis), the more they are apt to borrow. The farm cost and input credit actually move in the same direction, in that input credit automatically raises farm cost, and the need (or desire) to expend more on inputs to increase yield, and thus income, leads to a higher input cost.

In terms of seasonality effects, the pre-harvest period is the time that the highest amount of credit (MK847.65) is given out and to a higher number of participants (147), followed by the harvest season. The least amount of credit lent is during the planting season. This result can be explained by the agrarian household income earning cycle. In pre-harvest period most households deplete their income, hence the need to borrow.

### **5.3 Ordinary Least Square (OLS) Estimation of the Extent of Credit**

This section estimates the relationship between the various variables discussed and the extent of borrowing on all valid (greater than zero) credit transactions. From the equation (2), the dependent variable is the Extent of Credit, which is, the amount of credit received, the independent variables are farm occupation, family size, input credit, food credit, farm expenditure, per capita income and sex of household head. In addition, district and seasonal independent dummies are included for this regression as

well. The OLS regression was run on all households that took credit. Results of the estimation used are presented in Table 26.

Results indicate that the amount of borrowing per household is positively and significantly dependent on per hectare farm expenditure and family size. Of course the higher the expenditure on farm and the larger the family size, the more the need for credit.

**Table 12: Determinants of The Extent of Household's Credit Market Participation**

Variable	Coefficient	T-Statistic
Constant	-896.82	-3.01***
Farm occupation	152.28	1.55
Family size	111.80	6.95***
Input credit	-63.18	-0.57
Farm expenditure	281.06	2.73***
Sex of household head	-174.56	-2.03**
Dowa dummy	9.08	0.07
Nkhotakota dummy	188.27	1.47
Rumphu dummy	-55.05	-0.45
Mangochi dummy	105.50	0.80
Planting dummy	-137.07	-0.67
Pre-harvest dummy	241.07	1.26
Post harvest dummy	186.09	0.92

\*\*\*shows significance at  $p < 0.01$ ; \*\*shows significance at  $p < 0.05$ ; Adjusted R-squared=0.72 n=302

In contrast, the amount of borrowing per household is negatively and significantly dependent upon the planting season. The planting season is when farmers are embarking on the actual agricultural work such that they have already secured loans for

inputs, this then means that they cannot borrow for either inputs or food consumption. Though farm occupation and food credit are not significantly different from zero, but are positively related to the amount of household borrowing.

## **6.0 CONCLUSIONS AND RECOMMENDATIONS**

This study has demonstrated that credit plays a major role in the rural areas. The results indicate that 75% of the households had participated in the credit market, with over 34% of the loans being utilized for consumption purposes. Having established the importance of credit in the study, we now recap some of the features of the credit market, and determinants of household's demands for credit from our analysis.

There are some socio-economic distinctions observed between borrowers and non borrowing households in the study. Although the estimate for income was not significant at  $p < 0.01$ , households with lower incomes participated more in credit markets, particularly when looking at multiple borrowers (MK92.86 for non borrowers and MK82.25 for multiple borrowers).

Sale and consumption of livestock was utilized by both credit market participants and non-participants, probably an indication that some households were not able to borrow, or if borrowed, did not manage to acquire enough credit. In terms of input usage/non usage, borrowers used more fertilizer on maize than non-borrowers. This indicates that borrowers are more concerned about food security.

Determining the probability of a household's participation in a credit market through a probit estimation, family size, harvest season, post harvest season and pre harvest seasons increases the probability of participation. In terms of extent of borrowing, the OLS estimates indicate that per hectare farm expenditure and family size significantly and positively affect the amount of loan a household borrows, while the planting season has the opposite effect.

The study has also shown that the bulk of credit in the formal sector is limited to productive needs. Credit for consumption is mainly from the informal sector. However, there is recognition that consumption and production in the smallholder households are intertwined and inseparable. Consumption loans are often productive as they serve to preserve the household's productivity. Based on this, it is recommended that credit institutions should diversify their loans. Lending from formal institutions has to address not only production and income generating activities but also consumption and household needs such as health and education.

In conclusion, providing financial services to the rural poor must be an integral component of any development policy. The study has indicated that sustainable financial institution signifies credit not only for agricultural production, but also for consumption smoothing and income diversification. Given the highly fluctuating incomes of rural households and incomplete insurance markets in Malawi, access to credit can potentially contribute to income generation and income stabilization, thereby reducing both transitory and chronic food insecurity, and consequently attaining one of the important goals in development planning.

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