

Effect of Credit on Household Welfare: The Case of “Village Bank” Credit in Bomet County, Kenya

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Abstract: Many of the credit programs specifically target the poor on the premise that they are more likely to be credit constrained and have restricted access to the wage labour market. The purpose of this study was to assess the role of credit service on welfare of the microfinance clients. The study area was Bomet County and the sample was drawn from Mulot and Silibwet “village banks”. A sample of 125 “village bank” members was selected, out of which 91 had used the credit service. Primary data on the selected respondents was collected using a structured interview schedule and secondary data was obtained from the selected “village banks” operating in the study area. Analysis of Variance and Heckman’s selection model which corrects for selectivity bias in the sample was used. The model consists of a probit equation (borrowing participation equation) and target equation of per capita household expenditure. The results from the study indicated that “village bank” credit positively influences household welfare. This means that there is a positive relationship between the amount borrowed and household welfare. The household income of credit participants is also significantly higher than that of the non-participants. Besides credit, education, age of the household head, farm and off-farm income play a significant role in determining the wellbeing in a household. Thus the government and other development agencies can inject an additional loan capital to the village bank. This will enhance on their outreach on credit services.

Key words: Credit, effect, heckman, village bank, welfare

INTRODUCTION

Credit has been identified as a necessary vehicle that has the potential to enhance economic growth of the least developed countries’ economies. In the World Bank’s “World Business Environment Survey” (WEBS) of more than 10,000 firms in 80 countries, Small and Micro Enterprises (SMEs) worldwide on average named financial constraints as the second most severe obstacle to their growth, while large firms on average placed finance only fourth (Beck *et al.*, 2003). It has also been noted that micro enterprise development is an effective means of assisting the poor in developing countries (Zeller and Sharma, 2000). They have the potential to create employment, especially given that in Africa, the agricultural sector which is the main sector has a limited ability to absorb new job seekers (Pretes, 2002). There is however profound cases of coexistence of access to credit and poor welfare which is a paradox and limited effort has been put to identify the underlying factors. There have nevertheless been some striking experiments mostly from outside Africa that have allegedly produced impressive

results; usually measured in terms of outreach and repayment rates, and have been driven largely by the perceived unlimited demand for credit (Buckley, 1997).

The biggest challenge facing Kenya today is high levels of poverty among its citizens. Poverty has been persistent in Kenya despite government’s effort to combat it through national development programs. This is reflected in the rising number of people without access to food, and with inadequate access to other basic necessities (Mango *et al.*, 2009). Kenya’s current Poverty Reduction Strategy Paper (PRSP) perceives poverty as inadequacy of incomes and deprivation of basic needs and rights, and lack of access to productive assets, as well as social infrastructure and markets. Poverty is largely a rural phenomenon and prevalence of absolute poverty in rural Kenya is 49.1% (GOK, 2007). It is noteworthy that two of the Millennium Development Goals (MDG) targets to reduce the proportion of people whose income is less than \$1 a day and who suffer from hunger by half by the year 2015 (United Nations, 2006).

Diagne and Zeller (2001) established that poor households whose assets consists mostly of land and

livestock but who wish to diversify into nonfarm income-generating activities may be constrained by a lack of capital, as both sectors of the market do not grant them access to credit. Additionally the benefits of access to credit for smallholder farmers depend on a range of agro ecological and socioeconomic factors, some of which are time-variant and subject to shocks such as drought. The full potential of credit access in increasing the welfare of the poor can however be realized only if coupled with adequate investments in hard and soft infrastructure as well as investment in human capital (ibid).

Subsequently, it has been pointed out that lack of access to credit has had a negative impact on education, employment opportunities and health services which in turn perpetuates the vicious cycle of poverty and adverse vulnerability. Many organizations are thus now using microfinance strategies as a way of providing affordable financial services targeting the vulnerable in a bid to alleviate poverty and enhance food security. It has been underscored that decentralized microfinance strategies are more effective in enhancing its positive impact. Johnson *et al.* (2005) indicated that decentralized model which involve greater user-ownership and management have the potential to provide services to poorer people and in rural areas due to inherently lower cost structures and key characteristics of their services, despite many challenges to their long-term effectiveness and sustainability. Microfinance services offered must however be flexible to better meet client needs and maintain retention while keeping costs low (Mknelly and Kevane, 2002). However as the financial institution matures and borrowers become more sophisticated, new mechanisms must be developed that respond to the differentiated borrowing and savings products that clients need to improve their livelihood security, smoothen their consumption and cope with shocks and life-cycle changes (ibid).

The “village bank” model is one of such decentralized strategies and is promoted with the ultimate objective of enhancing access to microfinance services and thus reduction of poverty. It’s noteworthy nonetheless that despite concerted efforts by various microfinance organizations to mitigate problems facing the rural poor, their plight still remains unabated. However, since the implementation of the “village banks” strategy in the county, little is known about the impact of the credit as one of the services provided on welfare of the beneficiaries in question and the area at large. It is noteworthy that the model serves only its own members and hence the sample considered pertains to participants that have used the credit facility and those who have not being the control group, both within the membership. The objectives of the study are thus to determine the effect of the “village bank” credit on household expenditure; and establish the income difference of the household who are

participants and non-participants in “village bank” credit in Bomet County. The parameters of interest are household income and expenditure as they influence and determine the welfare of households. The assets considered include only the movable assets which have a market value and the expenditure pertain to the recurrent expenses for consumables within the household.

MATERIALS AND METHODS

The study was conducted in Bomet County, Kenya and data collected in April 2009. The county is administratively divided into six divisions, namely Bomet Central, Longisa, Sigor, Siongiroi, Mutarakwa, and Ndanai. This study covered more specifically, Bomet central, Longisa and Sigor divisions, which are the main operational areas for the “village bank” program. In all, the study covered two “village banks”, namely Mulot and Silibwet whose clients spread across the district. The climatic condition of the area ranges from semi arid to highland, with a diversified economy of which maize and tea are the main crops and dairy farming being the predominant livestock activity.

The members identified as per the division, location, sub-location and village in which they are located is composed of those with credit and those without. Membership in the selected “village banks” were then stratified into those who have used credit service and those who have not. However, only borrowers that were at least one year old in the credit program were considered by selecting those who had taken credit by the end of 2006 and those that had not used the credit facility being the control group. A random sample was selected from the membership list as a sampling frame of 8,490 members of which 5,085 were from Silibwet and 3,405 from Mulot. Those with loans were 2,094 and 2092 for Silibwet and Mulot respectively. Sample size made of 125 members was selected proportionately to the strata size.

The model: To analyze the effects of “village bank” credit on household’s welfare utility theory within the agricultural household model was used (Singh *et al.*, 1986). The framework explains the effect of credit and household specific characteristics on welfare as measured by household assets, income, food security status and expenditure; given the interplay of institutional factors. The assumption is that the household’s ranking of goods to be consumed can be represented by a utility function of the form:

$$\text{Utility} = U(x_1, x_2, \dots, x_n; \text{Other things}) \quad (1)$$

where the x 's refer to the quantities of the goods that might be chosen, “other things” notation is used as a reminder that many aspects of individual welfare are

being held constant (Nicholson, 2005). Households' attempt to maximize their gains and they do this by increasing their purchases of a good until what they gain from an extra unit is just balanced by what they have to give up to obtain it. In this way, they maximize "utility"-the satisfaction associated with the consumption of goods and services.

The utility the household derives from the various consumption combinations depends on the preferences of its members, which in turn is influenced by a vector of household size such as members' composition and structures.

The maximization of household utility is however subject to cash, time and output constraints (Eq. 2).

$$\text{Max } U(\chi_1, \chi_2, \dots, \chi_n; \text{welfare}) \quad (2)$$

Subject to:

- Cash constraint
- Time Constraint:
- Output Constraint

The cash constraint implies that the household needs cash to purchase goods that it cannot produce. The cash is generated from its marketable surplus. From its surplus income, the household must pay out hired labour and material inputs as well as paying for purchased marketed consumed goods. If the household's surplus income is not adequate to finance production costs, she must depend on external financial services such as transfers and borrowings. Hence, household's income in a single decision-making period is composed of its net farm earnings from production, and income that is "exogenous" to the farm production such as transfers and borrowing. In effect, credit enters the household's utility maximization objective function through the cash constraint.

The household's utility maximization is also subject to time constraint because total income available must be allocated among leisure, farm production, and off-farm employment. Thus, credit enters a time-constrained household indirectly to buy out his leisure through hiring labour.

Production is also subject to a technical constraint and the household production capacity as defined by the amount of available variable and fixed inputs. But taking a loan is a risk in itself, yet clients are willing to bear this risk. Credit default leads to loss of access to valued financial markets as well as loss of self-esteem, confidence, and social assets. However by the borrowers increasing their contribution to household income, they reduce their households' vulnerability and strengthen their options in dealing with shocks. Maintaining access to credit is integral to many clients' risk management strategy. By making credit available, credit organizations provide clients and their household's ways to protect them

against risk and to take advantage of opportunities as they present themselves. Not surprisingly, clients go to great lengths to repay, even when confronted with a crisis or shock. Repayment can lead eventually to new loans and to starting on the road to recovery to restock a micro enterprise, rebuild a house, or pay school fees.

Credit (measured as a dummy or amounts) however leads to a selectivity problem. To correct for the selection bias, a heckman selection econometric model is used. This model also helps in estimating the effect of "village bank" credit on household's economic performance.

The general model for effect of borrowing or participation on household outcome (Heckman, 1979; Greene, 2003) (with consideration of other factors of household expenditure, assets and food security status) follows next.

$$y_i = \beta_i x_i + \alpha_i c_i + \varepsilon_i \quad (3)$$

where y_i is the household outcome (household expenditure, income, assets and food security status), x_i is a vector of exogenous factors and c_i is amount of credit accessed. The estimator α , measures the effect of the credit, but because credit is a measure of borrowing, it implies that borrowing is endogenous to y_i and exogenous to some variables in x_i . If the variable c_i were only endogenous to y_i and not exogenous to some other x_i factors, then Eq. (3) would be estimated by Two Stage Least Squares (TSLS), with c_i being instrumented with an appropriate instrumental variable or estimated via treatment model. However, for the case of this study, borrowing was also exogenous to other factors, such as household assets, income etc. Therefore, Eq. (3) had to be estimated as a heckman selection model and because of selection problem; a participating function had to precede in the first stage to correct for sample selection problem (Heckman, 1979; Greene, 2003). The model expression is as follows

$$\left. \begin{aligned} y_i &= \beta_1 x_{1i} + \alpha_i c_i + \varepsilon_{1i} \\ D &= \beta_2 x_{2i} + \varepsilon_{2i} \end{aligned} \right\} \quad (4)$$

where, y_i are the outcomes for borrowers, x_{1i} are the factors that influence outcome functions for borrowers. D is the dummy variable for participation in borrowing ($D = 1$, if borrowed/ participant and $D = 0$, otherwise), x_{1i} is a vector of covariates that influence the probability of participating in borrowing. The outcome y_i variables are observed condition on the participation in credit criterion determined by the 'D' function, which is estimated via a probit model to yield β_{2i} estimates. The estimated β_{2i} were then used to generate Mills ratios which were incorporated in the second stage equation by being regressed on y_i . β_1, β_2 are thus the corresponding vectors of parameters and $\varepsilon_{1i}, \varepsilon_{2i}$ are random disturbance terms.

The estimation of the parameters is accomplished by maximization of the likelihood function using Heckman’s maximum likelihood estimation approach with details presented under model specification below.

Specification of empirical models:

Analysis of variance: A univariate analysis of variance (ANOVA) for independence of means was used to compare two categories of households i.e. mean income of borrowers and non-borrowers members of the “village bank”. ANOVA is a statistical technique used to analyze the variance to which the response is subject, into its various components corresponding to the sources of variation, which can be identified. Therefore, to test the equality of the sample means of the two categories of farmers an F test at 90% confidence level was used.

Heckman selection model: In estimating the effect of credit on household expenditure this study employed two-step selection model, which is accomplished using Heckman’s selection correction method.

As pointed out earlier, Heckman selection regression model involves two stages. The first stage involves a probit model to predict the probability of borrowing status. From probit estimation, appropriate inverse mills ratio (IMR) is generated which is included as a parameter estimator in the second stage of the structural equations. This procedure solves the sample selection problem. The effect of borrowing on household expenditure is then determined by the significance of the *betas*. In a simplified form, the structural equations and participating equation would be:

$$y_i = \delta_i c_i + \beta_i x_{1i} + \mu_i \text{ (Borrowers structural function)}$$

$$D = \alpha_i x_{2i} + \varepsilon_i \text{ (The participating function)}$$

By breaking the expressions above, the estimation for participation function in its first stage becomes:

$$pr(D) = \alpha_i x_{2i} + \varepsilon_i \tag{7}$$

The left-hand side variable denotes probability of borrowing from “village bank”. The x_{2i} is a vector of factors that influence borrowing or not borrowing. The following factors are considered; age, education, if the household owns land (indicator of traceability of the borrower), farm income, off-farm income, transfer income, assets, distance to market (indicator of location of the borrower), household head farming years, gender if female head, household size, and household owned land size whose units of measurement are described in Table 6. In stage two, structural target equations for participants are specified as below:

Table 1: Summary statistics of household income (Natural log of total income)

Accessed credit	Mean	S.D.
No	11.871	1.386
Yes	12.299	1.200
Total	12.161	1.274

Source: Survey data 2008.

$$\ln y_i = \delta_i \ln c_i + \sum_i^n \beta_i x_{1i} + \lambda_i IMR_i + \mu_i \tag{8}$$

where, y is household expenditure per capita. Total household expenditure is an aggregate of cost of staple food items, non-staple fresh food items, non-fresh food items, non-food items and contributions by the households. The independent variables considered are credit from “village bank”, credit from the other sources, farm income, off-farm income, transfer income, distance to market (all transformed by taking natural logarithms), household head age, and education, household size (measurement units as per Table 6) and IMR (Inverse mills ratio). The parameters then to be estimated are β , α , and λ , whereas μ_i and ε_i are the respective error terms. Heckman selection model was used to correct for selection bias of beneficiaries of credit service by the “village bank” model.

RESULTS AND DISCUSSION

Effect of credit on household income: Income has been a common denominator on which welfare status is gauged. Hence analysis of variance was used to analyse the mean difference of household income for those who took credit from the “village bank” and those who did not.

This section presents differentials between credit participants and non-participants in income which could be due to intensities of input use and improved land productivity. The premise behind the analysis was that credit is usually used as a policy tool in the acquisition and use of purchased productive inputs, with expected increase in production and subsequently increased income. Borrowers were therefore, expected to acquire and use more of such inputs and consequently realize higher returns compared to non-borrowers. Factors such as fertilizers, crop and animal protection chemicals, purchased livestock feeds and hired labour can easily be accessible when farmers are less cash constrained. “Village bank” non-participants were households who although belonged to “village bank” group, did not participate in borrowing.

The income of those that indicated participation in credit is higher than their counterpart who did not participate in the credit programme (Table 1).

Hence the “village bank” credit participants in Bomet had significantly higher mean income of 12.30 compared

Table 2: Analysis of variance household income as per participation in the credit of "village bank"

Source	SS	Df	MS	F	Prob. > F
Between groups	4.349	1	4.349	3.250	0.074*
Within groups	171.426	128	1.339		
Total	175.775	129	1.363		

*: level of significance at 10%

Table 3: Maximum likelihood estimation of Heckman selection equation

Variable	Coeff.	S.E.	Z	P>z
Probability of Participation in credit service				
Hhdgender	- 0.014	0.352	- 0.040	0.967
Hhdage	0.016	0.012	1.380	0.167
Hhdeducyrs	0.028	0.036	0.800	0.426
Hhdsize	0.025	0.030	0.840	0.399
Lndistmkt	0.287	0.122	2.350	0.019***
Lnofffarmypcap	0.115	0.034	3.380	0.001***
Lnfarmypcap	0.182	0.069	2.610	0.009***
Lnasetpcap	- 0.412	0.118	- 3.490	0.000***
Hhdfarmown	- 0.115	0.949	- 0.120	0.904
Lknownlndsz	0.122	0.173	0.700	0.483
Lntransan	- 0.021	0.037	- 0.580	0.565
Target equation				
Lnvbcrdt	0.381	0.098	3.900	0.000***
Lnotherdt	0.058	0.031	1.880	0.060*
Hhdage	0.030	0.013	2.360	0.018**
Hhdsize	- 0.021	0.033	- 0.620	0.535
Hhdeducyrs	0.002	0.040	0.050	0.962
Lnofffarmypcap	0.098	0.042	2.340	0.019**
Lnfarmypcap	0.228	0.079	2.890	0.004***
Lndistmkt	0.555	0.147	3.780	0.000***
Lntransan	- 0.010	0.040	- 0.240	0.813
/athrho	0.883	0.231	3.830	0.000***
/lnsigma	0.316	0.093	3.380	0.001***
Rho	0.708	0.115		
Sigma	1.371	0.128		
Lambda	0.971	0.223		
N	125			
Wald χ^2 (9)	3405.13			
Prob > χ^2	0.000***			
LR test of indep. eqns. (rho = 0): χ^2 (1) = 10.74 Prob > χ^2 = 0.001***				

***, ** and *: levels of significance at 1, 5 and 10%, respectively

to non-participants mean of 11.87, with p-value of 7% (Table 2). It can thus be inferred that participation in credit increases the income which could be facilitated by adoption of new technologies and good farming practices through improved frequency of attendance to farming training and increased extension contacts among other factors.

The findings confirm that of (Remenyi *et al.*, 2000) that indicated that household incomes of families with access to credit is significantly higher than for comparable households without access to credit.

Effect of credit on household expenditure: Household expenditure because unlike income or assets depicts real purchasing power as other sources of income for expenditure are rarely captured in the income variable. Expenditure here was composed of food and non-food household expenses. These are expenses on consumable items and remittances which are recurrent savings for the purchase of assets. The model wald test chi-square of 3,405.13 is significant with p-value of 1% which indicates

that the variables included in the model best specify the functional relationship in the model (Table 3). The likelihood ratio test that is significant also with p-value of 1% indicates the correlation of the error terms in selection and target equation and hence justifies the use of Heckman selection model.

The significant variables in the selection equation are distance to market, farm income, off-farm income and assets per capita (Table 3). Their influence on probability to participate in the credit programme is given by their marginal effects.

The elasticity of response of probability to participate in credit with respect to change in off-farm income, distance to market, farm income and assets per capita are 0.315, 0.242, 0.579, and -1.390, respectively (Table 4). It follows therefore then that a 10% increase in off-farm income leads to a 3.15% points increase in the probability of borrowing from the "village bank". It's worth noting here that most of the off-farm enterprises that the households engaged in are generating more regular income and are not as prone to vagaries of weather as the

Table 4: Elasticities/marginal effects of selection equation after heckman

Variable	dy/ex (dx)	S.E.	Z	P>z	X
Lnoffarmpcap	0.315	0.094	3.370	0.001***	7.664
Lnfarmpcap	0.579	0.222	2.610	0.009***	8.937
Lndmkt	0.242	0.102	2.380	0.018**	2.360
Lntransan	- 0.014	0.024	- 0.570	0.565	1.804
Lnasetpcap	- 1.380	0.399	- 3.460	0.001***	9.390
Lnownlndsz	0.047	0.067	0.700	0.485	1.082
Age	0.006	0.004	1.390	0.164	43.056
Hsize	0.009	0.011	0.850	0.397	8.536
Hheduc	0.010	0.013	0.800	0.426	9.784
Gender	- 0.005	0.126	- 0.040	0.967	1.144
Hfarmown	- 0.041	0.339	- 0.120	0.904	1.008

***, ** and *: levels of significance at 1, and 5%, respectively.

Table 5: Elasticities of target equation after heckman

Variable	ey/ex (dx)	S.E.	Z	P>z	X
Lnvbrdt	0.325	0.094	3.460	0.001***	6.825
Lnothcrt	0.024	0.013	1.870	0.062*	3.309
Lnoffarmpcap	0.094	0.040	2.370	0.018**	7.664
Lnfarmpcap	0.255	0.083	3.090	0.002***	8.937
Lndmkt	0.164	0.043	3.780	0.000***	2.360
Lntransan	- 0.002	0.009	- 0.240	0.813	1.804
Age	0.004	0.002	2.430	0.015**	43.056
Hsize	- 0.003	0.004	- 0.620	0.537	8.536
Heduc	0.000	0.005	0.050	0.962	9.784

***, ** and *: levels of significance at 1, 5 and 10%, respectively

farming enterprises. Hence it would be a good basis for assessing the ability of the potential to service loans.

Likewise the farm income is positively and significantly related to the probability of participating in credit. A 10% increase in farm income leads to 5.8% points increase in the probability to access credit. It's always the case in developing economies that most of the enterprises that the rural households engage in are agriculture based. Hence since most of the enterprises that credit is based on are farming enterprises, the amount of income generated from the said enterprises would be of significance in gauging their ability to repay the loans.

Distance to market indicates the location of the household in relation to a nearby urban market. Hence the more the distance, the further the household is from the said market. It is therefore worth noting that the further the household from the market, the lower the access to the financial institutions. Hence the positive significant relationship between distance to market and participation in "village bank" credit indicates the importance of the program to rural households in the remote inaccessible areas. A 10% increase therefore of distance to market leads to a 2.4% increase in the probability to participate in the credit program from the "village bank".

Household assets base as the other significant factor that influences participation in credit has a negative effect. It is not surprising though given that apart from the ability to generate income ability of the household, the other major factor to consider is character of the borrower and not the assets in the rural settings. Given the informal nature of the "village banks" their capacity to enforce legally their credit contracts in case of default is limited.

Also the members with high value of asset base would opt to go to alternative sources of credit given the high interest in the village bank (of up to 4% per month) and the condition of joining a group for one to access loan. Hence a 1% increase in per capita assets will lead to a 1.4% reduction in the probability to participate in the "village bank" credit.

In the second step the model shows results of the effect of credit and household characteristics on per capita expenditure. Per capita household expenditure best captures the welfare of the household as it indicates how much expenditure a household spend per member. The per capita expenditure also captures the distribution of expenditure apart from the amount of it.

The factors that significantly influences the household expenditure and hence welfare are "village bank" credit, credit from the other sources, age of the household head, off-farm income, farm income and distance to market (Table 5).

The elasticities of their effects on per capita household expenditure are 0.325, 0.024, 0.094, 0.225, 0.164 and 0.004 for "village bank" credit, credit from the other sources, off-farm income, farm income, distance to market and household head age (Table 5). The amount of credit from the village bank is the accumulative amount of credit accessed from the year 2006 to end of year 2007. The rationale for taking the credit for the selected period is the fact that it takes time for effect of credit to be realised and that taking repeat loans improves on their effect on household welfare. Hence a 10% increase in the credit accessed will lead to a 3.25% increase in the per capita household expenditure. This confirms the findings

of (Wright *et al.*, 2000) that established that there is a positive relationship between credit and nutrition, health and primary schooling. The findings are further affirmed by Morduch and Haley (2002) that established that borrower households spend 20% more on education than non-client households.

The amount of credit accessed from the other sources likewise leads to an increase in the per capita household expenditure. A 10% increase of amount of credit accessed from the other sources leads to a 0.24% increase in the per capita household expenditure. It follows therefore that credit from whichever source has positive influence on the household welfare.

Off-farm enterprise activities as a source income positively influence both participation in credit program and household welfare. It improves the household level of participation on credit and subsequently also increases the welfare status of the household through increased per capita expenditure. Hence a 10% increase in the off-farm income leads to a 1% increase in the per capita household expenditure.

Likewise farm enterprise activities as a source of income significantly influence the household per capita expenditure positively. Farm income also positively influences participation in credit programme and thus a dual positive effect on the household welfare. Hence it has an effect of improving the household borrowing from the village which also has a positive effect on the per capita expenditure of the households. Subsequently, a 10% increase in the farm income leads to a 2.25% increase in the household's per capita income.

As used in the selection equation the distance to market measures the household location effect. The significant positive relationship of distance to market and per capita household expenditure indicates that the further the household is away from the market, the higher the per capita expenditure. Hence a 10% increase in the distance to market leads to a 1.64% increase in the per capita expenditure. This can be explained by the variation in the agriculture potentiality of the said areas. It worth nothing also that the further the household away from the market is the higher the participation in the credit programme and hence improved per capita expenditure.

The age of the household as another significant variable influences the level of per capita household expenditure positively. Household head age and farming years are highly correlated indicating that the older the household head, the better the farming experience. Hence the older the household head, it is presumed that the more the assets they have accumulated and subsequently the higher the incomes they generate. Hence a 10% increase in the age of the household head leads to a 0.4% increase in the per capita household expenditure.

This confirms to the findings of Hashemi, and Morshed, in Morduch and Haley (2002) that there was an

increased caloric intake for households of Grameen bank participants.

In summary, the assessment of impact of credit on the wide range of household parameters helps to mitigate on the problem of loan fungibility. Hulme and Mosley (1997) indicated that for all studies except for those that focus exclusively on 'the enterprise' the concern about fungibility may be irrelevant. Since the study is looking at the household, or the household economic portfolio, fungibility is not a problem but it is rather a vital strategy for the client. The best investment returns may be on 'consumption' in terms of developing or maintaining human capital through school fees and doctors' bills, or buying food at a time of crisis when the credit terms are on 'in-kind'.

Wolday (2003) acknowledged that the delivery of microfinance services to the rural poor is one effective instrument to promote food production and food security.

CONCLUSION

The use of income and household expenditure was to counter the methodological problems relating to the fungibility of money. The results of anova test indicate that the income of the participants in credit service is significantly higher than those that have not participated. The heckman results subsequently identifies credit amount, income, distance to market and age of the participants as statically significant correlates and hence key in positively influencing on the level of household income. "Village bank" members who have used credit facility are better off than those who have not used the service as expressed through higher household expenditure and income which influence positively on improvement of welfare of the households.

It is also established that the "village bank" program as an innovation of user-owned financial institution that provide the much needed financial services in areas that are otherwise excluded from the mainstream financial system is playing a crucial role and influencing positively on the various household outcomes. Hence the program occupies a central position in the endeavour to improve the welfare of rural households.

The model fills a gap left by formal banks due to ease of flow of information of client's credit history. "Village bank" members who have used credit facility also participated more in the use of extension services and attendance to farmer training. Hence participation in the credit facility provides a forum for access to other supplementary services which enable the participants to improve on their farming skills and hence improved production. There is however ample evidence to prove that there is a positive effect of microfinance on welfare

Even without having conducted a systematic study on the impact of the delivery of financial services on welfare,

we can logically arrive at the following conclusion: If welfare improves as a result of better physical capital endowments and if the delivery of financial services as indicated earlier provides opportunities to increase income and household per capita expenditure, then it is clear that the microfinance interventions contributed to the improvement of welfare.

Nevertheless although economic factors are certainly significant in explaining poverty levels among rural agricultural households, they fail to account for all causes of household poverty, and why some households become and remain poor while others come out of poverty yet

they seem to operate within the same economic environment.

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Appendix 1:

Table 6: Variable description and measurement

Variable	Description	Measure
Hhdage	Household head age	Years
Hhdgender	Household head gender	1 = male, 2 = female
Hhdeducyrs	Household head education	Years
Hhdsize	Household size	Number
Housexpcap	Household per capita expenditure	Kenya shillings
hhdfarmown	Household head land ownership	1 = yes, 0 = no
Offfarmypcap	Off-farm per capita income	Number
Transan	Transfer income	Kenya shillings
Farmycap	Farm per capita income	Kenya shillings
Asetpcap	Per capita assets value	Kenya shillings
Ownlndsz	Household owned land size	Acre
Vbcrdt	Amount of village bank credit	Kenya shillings
Othcrdt	Amount of credit from other sources	Kenya shillings
Probability to borrow	Participation in village bank credit	1 = yes, 0 = no
Hsexpcap	Household expenditure per capita	Kenya shillings
Distmkt	Distance of the tarmac road to the market	Kilometers

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