EFFECTS OF BORROWER CHARACTERISTICS ON LOAN REPAYMENT IN THE CREDIT WITH EDUCATION PROGRAMME IN THE TAMALE METROPOLIS OF GHANA

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ABSTRACT

Governments and development agencies have used several microfinance programmes to fight poverty. However, these programmes can only be sustainable if loans are repaid, because non-payment of loans can deny the poor of access to future credit, and reduce the interest income, profits and on-lending funds of financial institutions whose major asset is loans. This study examined the effects of borrower characteristics on loan repayment of participants in the Credit With Education Programme (CWE) implemented in the Tamale Metropolis. Cross sectional data collected from 375 borrowers were analyzed using a logistic regression model. Results of the estimation indicate that repayment is positively influenced by age, access to market and number of loans received but negatively influenced by household size of borrowers. The study recommended replication of the CWE programme by other MFIs, but called for intensification of screening of borrowers by peers and increased education on market access by the MFIs.

KEYWORDS: Borrower, Characteristics, Loan, Repayment, Credit, Education, Programme, Tamale, Ghana.

INTRODUCTION

The global struggle against poverty stems from the fact that poverty is broadly considered as a major threat to education, health, peace, and investment which are necessary for development (Neville, 2003). As such, governments and development agencies have developed several strategies over the years to fight poverty of which various forms of microfinance programmes are implemented. Microfinance is the provision of financial services to low-income clients, including consumers and the self-employed, who traditionally lack access to banking and related services (Gonzalez-Vega, 2008)

The justification for the use of microfinance in fighting poverty is in line with Sen's capability approach that microfinance provides an opportunity for increasing capabilities of the poor to realize their economic and social well-being (Crocker, 2006). The basic principle of microcredit is that it targets only the poor with emphasis on women who are socially and economically the most impoverished in society (Mahmud, 2008). According to Armendariz de Aghion and Morduch (2010), "microfinance presents a series of exciting possibilities for extending markets, reducing poverty, and fostering social change" (p.3). They noted that charitable organisations like the Bangladesh Rural Advancement Committee (BRAC) and Freedom from Hunger have become major micro-lenders, with missions that also include working to improve health conditions, empower women, and meet the aims of the United Nations' MDGs.

In spite of these justifications, microfinance can only have sustainable impact on the poor if only loans are repaid. Roslan and Mohd (2009) warned that non-payment of loans can have serious consequences including denying clients access to future credit and also bringing shameful social pressure from group members who often guarantee the credit. Similarly, Francis (2009) noted that non-payment of loans reduces the interest income, profits and on-lending funds of financial institutions whose major asset is loans.

Notwithstanding the above consequences, lending to the poor is generally laden with repayment related challenges which have generated protracted arguments in the microfinance industry (Roodman & Qureshi, 2006). Bwonya-Wakuloba (2008) has noted that abundant literature supports the view that borrower characteristics are highly influential determinants of repayment. Theoretically, these characteristics are influenced by the existence of imperfect information which significantly increases default risks caused by adverse selection and moral hazard behaviours (Kono & Takahashi, 2010).

Notwithstanding these challenges and criticisms, MFIs around the world continue to provide loans to poor borrowers because there abound evidence that repayment rates of these people are very good (Tesfatsion, 2010). These high repayment rates are said to be due to the innovative credit methodologies. In Ghana, a leading MFI, Freedom from Hunger Ghana (FFHG), has supported Bonzali Rural Bank and Grameen Ghana to implement one of these innovative programmes called Credit with Education (CWE).

Despite concerns against reported low repayment rates of microfinance institutions, MFIs using the CWE methodology in the Tamale Metropolis report excellent repayment rates even above the global best record of 99 percent achieved by the Grameen Bank (Tesfatsion, 2010).

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These reported repayment rates appear quite unusual considering the fact that most of the target groups are poor clients engaged in risky agro-based businesses. Besides, the report is not backed by any empirical evidence on the factors responsible for the reported repayment rates.

Yet, based on these results, the MFIs are continuing with loan disbursements in order to achieve growth despite the absence of any empirical study on the causes of the high repayment rates. In addition, many more MFIs are prepared to adopt and implement the CWE methodology in the area. The current approach can collapse these CWE implementing MFIs should there be sudden default. The collapse of these MFIs can push many clients into extreme poverty since their savings constitute a bulk of the capital of the MFIs. It can also result in distortions in the financial system which can stifle national development efforts.

The need for an empirical investigation into the factors that influence the repayment claims of these CWE implementing MFIs in the Tamale Metropolis has therefore become imperative to help avert any future problems. Specifically, this study sought to examine the effects of borrower characteristics on loan repayment among the CWE clients in the Tamale Metropolis. The rest of the paper is made up of the theoretical and conceptual discussions and the methodology that underpinned the study. These are followed by discussion of the results or empirical evidence. The paper ends with conclusions and recommendations.

Theoretical and empirical literature on factors that influence loan repayment

Among the most notable theories of moral hazard are models by Stiglitz (1990) and Ghatak and Guinnane (1999). Building on the fundamental principles of the standard moral hazard model, Stiglitz (1990) proposed a moral hazard model for credit markets. Stiglitz hypothesized that by inducing group members to monitor each other's investment decisions and effort, the cost of monitoring by the lending institution is reduced, consequently mitigating moral hazard.

Contrary to Stiglitz's argument, Chowdhury (2005) developed a model which shows that joint liability alone cannot mitigate an ex-ante moral hazard problem. This view is supported by Aniket (2006) who claims that peer monitoring alone is not sufficient to ensure better performance as professed by joint liability models. In line with this argument, Simtowe, Zeller and Phiri (2006) made a relational presentation of loan transactions and stages in the joint liability lending model based on an earlier work by Sadoulet (2004). The model outlines that loan receipt is immediately followed by the stages of monitoring, return realisation, repayment or non-repayment. It provides theoretical solutions for addressing various problems related to joint liability lending. For instance, the model proposes peer selection as

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a solution to adverse selection that may arise if the lending institution does the selection of borrowers. It also suggests peer monitoring as a solution to ex-ante moral hazard behaviours such as diversion of the loan to other uses other than investment in the business (Bassem, 2008). The model further proposes enforcement of group sanctions as solution against ex-post moral hazard behaviour such as unwillingness to pay the loan even if the borrower has money to do so.

The philosophical basis of joint liability lies in the economic logic that joint-liability lending can mitigate some problems that arise in lending to poor people (Giné & Karlan, 2007). Various works on joint liability provide divergent reasons why microfinance institutions must adopt group lending methodologies to achieve high repayment rates. Ahlin and Townsend (2007) tested theoretical predictions for joint liability and argued that higher degrees of joint liability coincide with lower repayment, as do higher levels of cooperation within borrower groups.

However, Karlan (2007) counteracted this argument by establishing that stronger social connections yield higher repayment rates in joint liability groups in Peru and that socially closer peers monitor fellow members more. In a theoretical framework, Zhang (2008) included the non refinancing threat and demonstrated that group lending with joint liability can mitigate the moral hazard problem to achieve higher repayment rate than individual lending.

Aside the theoretical evidence, various empirical works have demonstrated the effects of joint liability on loan repayment and produced mixed results. Godquin (2004) investigated how group lending, nonfinancial services and dynamic incentives affect repayment performance of three microfinance institutions in Bangladesh. Results obtained from the analysis using the probit model showed that the amount of loan, social tides inside a group, and age of the group had significant and unexpected negative impacts on repayment rate.

The negative sign of the size of the loan was linked to the borrower's difficulty in repaying a larger amount over a short period (usually one year). Another reason for this result was related to what Paxton (1996) called the matching problem: as the duration of membership increases, the credit needs of the members of the group evolve differently. Godquin (2004) noted that this circumstance could result in tensions inside the group as the provision of intra-group insurance becomes more costly. For instance, with increasing variation in loan size, borrowers that are granted a small loan will no more feel comfortable to be jointly liable for borrowers that are granted larger loans. Another reason is that with increasing age of the group, members get to know each other better and are more reluctant to control and sanction

each other (decreasing power of social penalties). Godquin (2004) also found that access to basic literacy and health services had positive impact on repayment.

In an empirical analysis of microcredit repayment in south western Nigeria, Oke, Adeyemo and Agbonlahor (2007) set out to examine the causal relationship between socio-economic variables of borrowers and repayment. The study used the multi-stage stratified random sampling procedure to collect data from 20 borrowers and multiple regression model to analyse the factors affecting loan repayment. Results of this study revealed that the variables that significantly and positively affect microcredit repayment are income, amount of business investment, socio-cultural expenses, amount of loan borrowed, access to business information and membership of cooperative society. This finding corroborates the work of Godquin (2004) that income of borrowers and access to nonfinancial services have positive and significant effect on loan repayment. In contrast to the findings of Godquin (2004), Oke et al. (2007) argued that increasing amount of loan to borrowers will increase their repayment performance. Their results reject Godquin's assumption of decline in intra-group insurance as the group matures. This is because, group members who are properly selected and screened and are continually monitored would continue to remain committed to the group goals.

Oladeebo and Oladeebo (2008) studied socio-economic factors influencing loan repayment among small scale farmers in Ogbomoso agricultural zone of Oyo State in Nigeria. The multistage random sampling technique was adopted to select 100 farmers and data from these farmers were analysed using the Ordinary Least Square multiple regression analysis. The study found that the amount of loan obtained by farmers, years of farming experience with credit use and level of education were the major factors that positively and significantly influenced loan repayment. This finding on positive impact of loan amount on repayment confirmed the work of Oke et al. (2007) but contradicted the findings of Godquin (2004). The positive and significant effects of experience and level of education on repayment also contradict the findings of Oke et al. (2007) that these variables have no effect on loan repayment. The study also found that contrary to a priori expectation, age of farmers had negative and significant influence on loan repayment.

Kohansal and Mansoori (2009) investigated the effect of market imperfections in their study on factors affecting loan repayment performance of farmers in Khorasan-Razavi Province of Iran. Cross-sectional data from 175 farmers were analysed using the logit model to explain the probability of loan repayment on time as a result of any of the identified independent variables. Results of the study showed that farmer's experience, income, received loan size

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and collateral value have positive effect on loan repayment. The result on the loan amount supports the findings of Oladeebo and Oladeebo (2008) and Oke et al. (2007) but contradicts the result obtained by Godquin (2004). The finding on the positive effect of income corroborates the work of Oke et al. (2007) and Godquin (2004) while the finding on experience supports the work of Oladeebo and Oladeebo (2008). Kohansal and Mansoori (2009) however, found that loan interest rate, total application costs and number of installment had negative and significant effect on repayment performance of recipients. The evidence so for suggest differences in the effects of the factors that affect repayment.

Methodology

The study was conducted in the Tamale Metropolis of the Northern Region, one of the four poorest regions of Ghana. The Metropolis occupies a total area of 750 square kilometers and has a total population of 371,351 people with an annual growth rate of 2.5 percent (Ghana Statistical Service, 2012). Economic activities in the area are mostly agriculture related but women tend to operate low income businesses such as agro-processing, petty trading, grain trading, and dressmaking (Mahamadu, 2010).

A total of 375 borrowers were randomly selected using a multistage sampling technique. Primary data were collected using interview schedules that were administered on the borrowers, and focus group discussions with group leaders. The quantitative data were analysed using descriptive statistics and binary logistic regression. The dichotomous dependent variable was timely repayment, measured as 1 if the borrower made timely repayment, and 0 if the borrower delayed repayment. The regression coefficients were estimated through an iterative maximum likelihood method using the Statistical Product and Service Solutions (SPSS) version 20. The independent variables specified as factors that influence loan repayment based on literature were as follows:

X_1 =	Educational level	=	1 if literate and 0 if illiterate
X_2 =	Marital status	=	1 if married and 0 otherwise
X_3 =	Age (in years)	=	Number of years old
X_4 =	Religion	=	1 if Muslim and 0 otherwise
X_5 =	Residence status	=	1 if native and 0 if non native
X_6 =	Number of dependants	=	Number of people client takes care of
X_7 =	Household size	=	Number of people in household

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$X_8 =$ Experience in business   =   Number of years in business

$X_9 =$ Income level   =   Amount of money earned per month

$X_{10} =$ Age of group   =   Number of years

$X_{11} =$ Number of loans received   =   Number of times loans are received

$X_{12} =$ Current loan amount   =   Amount of money received

$X_{13} =$ Investment amount   =   Amount of money invested

$X_{14} =$ Access to market   =   1 if ready market and 0 otherwise

Results and discussion

Results on the personal characteristics of borrowers indicated that 82.4 percent of the 375 respondents did not have any form of education. Only 17.6 percent had some formal education, which varied from non-formal, primary, secondary, and tertiary education. Eze and Ibekwe (2007) found that educational attainment raise borrowers' productivity and increases their ability to understand and evaluate business information better. Thus, literate borrowers can have higher loan repayment rates than illiterate borrowers (Kono, 2007).

Out of the total of 375 respondents, 69.1percent had access to market for their produce. Only 30.9 percent reported inability to access market for the sale of their produce. Access to market is believed to have an influence on business success and better repayment performance (Paxton, 1996). The age distribution of respondents showed that the oldest CWE borrower was 70 years old, while the youngest was 22 years old (Table 1). The median age of the borrowers was 43 years old. Roslan and Mohd (2009) stated that older borrowers are wiser and more responsible than younger borrowers.

Table 1: Socio-economic characteristics of borrowers

	Median	Min	Max	Mean	Skewness
Age (yrs)	43	22	70	43.99	0.52
Number of dependents	5	0	10	5.13	-0.08
Household size	10	4	40	11.10	2.10
Business experience (yrs)	10	1	40	12.46	1.09
Monthly income	200	60	500	193.92	0.88

N=375 Source: Field work, 2011

While some borrowers had no dependants at all, others had as many as 10 dependents. The mean number of dependents was five persons with a standard deviation of 1.95. Dependents refer to the number of people in the household who rely on the business income of the borrower. Bwonya-Wakuloba (2008) established that about three-quarters of the defaulters had five or more dependents, and that many defaulters who had a large number of dependents also experienced poor business performance, diverted funds, or had domestic problems. Other studies found that households with fewer dependents have a smaller claim on their business income, which should serve to reduce the default rate (Pollio & Obuobie, 2010).

Distribution of the respondents based on their household size revealed that the borrowers had between four and 40 individuals in households. The median household size was 10 members. With the positive skewness of 2.1, majority of the respondents have household size below the mean household size of 11 people. The microcredit literature presents varying results regarding the effects of household size on repayment. Chirwa (1997) and Godquin (2002) found no effect of household size on repayment whereas Eze and Ibekwe (2007) and Oladeebo and Oladeebo (2008) found significant effect.

Respondents' experience, measured in number of years in business shows that the borrower with most business experience had been in business for 40 years while the least experienced borrower had been in business for a year. A positive skewness, however, showed most borrowers had experience less than 11 years. Borrowers with many years of experience in business are more likely to earn more and repay loans more readily than those with less experience in business (Rosland & Mohd, 2009).

Income of respondents calculated on monthly basis included all forms of income irrespective of source. From Table 1, the poorest borrower earned GH¢60.00[i] while the richest one earned GH¢500.00. Most borrowers earned below the mean of GH¢193.92. Some studies have shown that income is not significantly related to the repayment performance. As argued by Godquin (2004), even though they had enough money, some borrowers also opted to default their loan repayments intentionally. On the other hand, Oni, Oladele, and Oyewole, (2005) found that borrowers with more annual income are more likely to repay their loans on time than those with smaller incomes.

Effects of socio-economic characteristics of borrowers on loan repayment
In terms of repayment performance, the results of the study indicated that 80 percent of the 375 borrowers were able to repay their loans on-time. Only 20 percent had delayed repayments. A number of variables related to the borrower characteristics were subjected to

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regression analysis to examine their effect on the repayment of loans. These variables include the age of borrower, age of group, educational level, marital status, household size, number of dependents, access to market, experience, religion, residence status, number of loans received, loan amount received, amount invested, and income level.

A binary logistic regression was used because the dependent variable is a dichotomous categorical variable and the explanatory variables were made up of both dichotomous categorical and continuous variables. The total number of cases (sample size) included in the analysis was 375 with no missing cases. The Logit model was evaluated using the omnibus test of model coefficients and the Hosmer and Lemeshow test. The omnibus test of model coefficients showed a chi square value of 203.046, degrees of freedom of 14 and a p-value of 0.00 as shown in Table 2.

Table 2: Omnibus test of model coefficients for borrower characteristics

	Chi-square	Degrees of Freedom	Sig.
Step	203.046	14	0.000
Block	203.046	14	0.000
Model	203.046	14	0.000

Source: Field Work, 2011

The large chi-square value implied that the model was a good fit and confirms the robustness of the study. Results of the Hosmer and Lemeshow test showed a chi-square value of 22.242, a degree of freedom of 8 and a significance value of 0.064. To support the model (in terms of robustness), the significance value should be greater than 0.05. Therefore, with the significance value of 0.064, the Hosmer and Lemeshow goodness of fit test also supported the model.

In order to explain the amount of variation in loan repayment caused by the model, the model summary table was used. However, the individual effect of these variables made use of the coefficients table. The Cox and Snell R^2 and the Nagelkerke R^2 were 0.418 and 0.661 respectively. This suggests that between 41.8 percent and 66.1 percent of the variability in the dependent variable (timely repayment) is explained by the set of independent variables. These R^2 values were considered high compared to an R^2 of 0.36 found in a study conducted by Oke, Adeyemo and Agbonlahor (2007) on empirical analysis of microcredit repayment in South Western Nigeria. Their study was carried out among small holder businesses that took loans from a nongovernmental microcredit organisation.

The coefficients of the microcredit repayment model (Table 3) showed that four variables were significant at 0.05 alpha level. These variables included age of borrower, household

size, access to market, and number of loans received. Three variables, age of borrower, access to market and the number of loans received had direct relationship with on-time repayment. However, household size had an inverse relationship with timely loan repayment. From Table 3, the variables with significant contribution to the microcredit repayment model did so at different levels. This information is shown by the Wald statistic of each predictor. Borrowers access to market opportunities was the highest (40.07) contributor to the model. This was followed by age of borrower (11.45), and the borrower's household size (8.11). The significant predictor with the least contribution to the model was the number of loans taken by the borrower, with a Wald statistic of 5.47.

Table 3: Microcredit repayment model for borrower characteristics

Variable	B	Wald	Sig	EXP(B)	95% CI for EXP(B)	
					Lower	Upper
Educational level	-1.32	4.16	0.410	0.27	0.075	0.950
Marital status	1.70	2.90	0.088	5.46	0.775	38.526
Age	0.10	11.45	0.001	1.12	1.044	1.177
Religion	2.30	4.20	0.400	0.10	1.107	90.610
Residence status	-2.37	2.65	0.104	0.09	0.005	1.623
Household size	-0.17	8.11	0.004	0.84	0.751	0.949
Amount invested	0.001	0.19	0.667	1.00	0.998	1.003
Access to market	5.48	40.07	0.000	2.38	2.29	13.10
Experience	-0.007	0.05	0.825	0.99	0.937	1.053
Income level	0.004	1.63	0.201	1.00	0.998	1.010
Age of group	-0.30	0.86	0.355	0.74	0.394	1.397
Number of loans	1.52	5.47	0.019	4.56	1.278	16.241
Loan amount	0.00	0.20	0.659	0.99	0.997	1.002
Constant	-9.91	15.61	0.000	0.00		

Source: Field work, 2011

Religion was coded as 1 if a borrower was a Muslim and 0 if a borrower was not a Muslim. The analysis in Table 3 shows that religion of borrowers had no significant effect on their ability to make timely repayment (B=2.30, p=0.40). Other variables that did not have significant effect on repayment included educational level, marital status, income level, residence status, loan amount, amount invested, age of group, and experience of borrowers.

One of the variables that had a direct and significant effect on timely loan repayment was the age of the borrower (B=0.10, p=0.00). This implied that older borrowers were more likely to make timely loan repayment than younger borrowers. Based on the Exp (B) value, an additional year in the age of a borrower increases the odds of timely loan repayment by 1.12. Contrary to the findings of this study, Godquin (2004) in using a probit model, found no significant relationship between the age of borrowers and their repayment performance.

The difference in findings may be due to the differences in study area and the kind of analytical tool used. For instance, in the Tamale metropolis where this study was carried out, older people (especially women) consider it a serious shame to be chased around by debtors. Results of the FGD in this study revealed that in extreme cases, some CWE groups put pressure on defaulting group members by visiting them at home to embarrass and force them to pay back the loan. However, in some instances, colleagues simply report the person to the community leaders or the loan officer so as to discontinue the supply of loans to that particular member.

Access to market was coded as 1 if borrowers had access to market and 0 otherwise. Table 3 shows that access to market information also had direct effect on timely microcredit loan repayment (b= 5.48, p-value=0.00). The positive B value of 5.48 and significance value of 0.00 meant that borrowers who had access to ready market for their produce had a higher likelihood of making timely repayment of loan. The odds ratio for borrower's access to marketing opportunities was 2.38. This means that the odds for timely repayment increased by 2.38 for borrowers with access to market as compared to those without access. This result contradicts the results obtained by Guttman (2007). Guttman used ordinary least square multiple regression analysis and found that access to market information was a negative and a statistically significant determinant of loan repayment at an alpha level of one percent. Guttman's findings were inconsistent with a priori expectation since market access allows a borrower to sell his/her produce and get faster returns to be able to settle their loans. The finding of this study however, corroborates the findings of Oke et al. (2007) that increased access to market increases financial returns and ability of borrowers to repay their loans.

The study also revealed through focus group discussions that borrowers' access to market was based on the fact that they sell food related produce which are bought everywhere in the community. Besides, one of the strategies that borrowers adopted to meet their joint liability obligations is to ensure that individuals within a solidarity group do not engage in the same business. This is to make sure that some group members would have money to pay for their colleagues when market for some products is not good. Additionally, groups give peer advice on the business of colleagues and how they can diversify their products in the face of market uncertainties.

The number of times that borrowers received loans had a significant and positive coefficient (B) of 1.52. The implication of this is that borrowers who had taken higher number of loans stood a higher chance of repaying back those loans on time. Further probe through focus

group discussions indicated that these borrowers receive loans on time and also understood that on-time repayment guarantees timely disbursements in future. The odds ratio for the number of times borrowers received loans was 4.56. This meant that an increase in the number of loans provided to borrowers within a particular period is likely to increase the likelihood of timely repayment by 4.56 times (all things being equal). Godquin (2004) and Bassem (2008) found similar results but attribute it to the simple reason that borrowers with many loans repay better just to get more in future. In a focus group discussion however, the borrowers attributed the result to enforcement of sanctions such as decrease in loan amount in future, penalty fees, naming and shaming, and reporting to community leaders.

Household size of borrowers is another independent variable that showed a negative relationship with timely loan repayment. Table 3 shows the coefficient for household size as -0.17 which is significant at 0.05 alpha level. This implied that borrowers with bigger household size were less likely to make timely loan repayment than borrowers with smaller household size. An additional member in the household of a respondent decreased the odds of repaying on time by a factor of 0.84 or increased the odds of non-repayment by 1.19. The explanation is that clients with larger households tend to have more mouths to feed, indicating more pressure on the savings of the borrower. Similar to this finding, Achoja et al. (2008) found an inverse relationship between household size and loan repayment performance both at five percent and one percent alpha level. Their study was carried out on self help microcredit groups in Nigeria, using ordinary least square multiple regression.

Conclusions and policy implications

The socio-economic characteristics of borrowers had mixed effects on loan repayment. While increases in age, access to market, and number of loans improved the chances of loan repayment, increases in household size decreased the chances of loan repayments. The most important borrower characteristics were access to market, age, household size and number of loans in that order. Other characteristics like educational level, marital status, religion, number of dependants, residential status, experience, and income level affected loan repayment, but they were not important.

It is recommended that the Bonzali Rural Bank and Grameen Ghana should consider giving more loans to borrowers who are older and matured so as to take advantage of their high repayment performance. This is particularly important as it will contribute to reducing poverty among the elderly. The MFIs should also provide education on marketing skills as

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well as lobby for the establishment of market facilities in the areas where borrowers are located. It is important to consider access to market as conditions for expansion of CWE to communities. The institutions should further target and provide loans to more of the borrowers with small households and encourage such borrowers to plan their families well in order to cut down cost, expand their business and make timely loan repayment.

The CWE groups are also advised to secure access to market for their produce before taking loans from MFIs. Care should be taken not to accept members who engage in businesses that do not have markets within the area. Borrowers should also continue to properly screen new members to ensure that only members who share common characteristics with the group are admitted. In addition, CWE bye-laws and sanctions against delay repayment should be strictly enforced without discrimination based on members' backgrounds.

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[i] The exchange rate at the time data were collected was 1.6 Ghana cedis to US$1.00.