MICROCREDIT REPAYMENT AMONG SMALLHOLDER FARMERS: WHAT MICROFINANCE INSTITUTIONS NEED TO KNOW

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ABSTRACT

Microcredit default among borrowers has been rising in recent years but empirical evidence to ascertain the factors determining repayment remain lacking especially in developing countries like Ghana. This study contributes to addressing this knowledge gap. The study used data of 224 microcredit borrowers from Ada West and Ada East districts to analyse factors determining repayment rate among smallholder farmer borrowers. Applying the logistic regression model, farmer and credit specific characteristics were used to analyse the determinants of microcredit repayment. From the logistic regression, age, gender, income, and number of dependants increase the likelihood of repayment. However, membership of farmer based organization, experience, interest rate, and duration of loan repayment negatively influences loan repayment. The study also found delays in loan disbursement resulted in loan use for unproductive ventures and repayment challenges. In addition, lack of training for borrowers on credit management, and investment procedures adversely impacted on loan repayment. The paper recommends that MFIs should institute measures to train borrowers on loan utilization, focus on women clients, since they have higher probability of repayment, reduce interest rate as well as putting in place mechanisms to reduce cost of operations.

Contribution/ Originality
In developing economies like Ghana's Microfinance Institutions (MFIs) rely on speculative means to advance credit to borrowers. This has produced adverse negative effect on loan repayment and the sustainability of microcredit schemes. Using speculative means such as collateral and credit history of potential borrowers has resulted in high rate of default among borrowers. The consequences were collapse of some microcredit institutions whiles others are in distress. This paper provides the empirical evidence that farmer and credit specific characteristics are critical for ensuring microcredit repayment and the sustenance of microfinance institutions (MFIs).

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1. INTRODUCTION

Microcredit (small loans) over the years has been used as a developmental tool and is regarded as a means of providing financial capital to smallholder businesses and vulnerable households, who otherwise would have no access to financial capital from the orthodox financial system for entrepreneurial activities (Kumar *et al.,* 2013; Bourlès *et al.,* 2018). In many communities in the developing world, microcredit can be obtained from microfinance institutions (MFIs) after certain basic criteria to access them are met.

The ultimate goal of the microcredit programmmes or schemes is to reduce poverty among poor people by increasing their access to financial capital in order to invest in income generating activities. Access to financial capital for the entrepreneurial poor, especially women, will boost living standards and reduce poverty in developing countries (Yunus and Weber, 2007). As Milton Freidman observed that the poor remains poor not because they are not entrepreneurial but because they lack financial capital to invest in income generating activities (Bell, 2014). The availability of financial capital to the poor can lift millions out of poverty. Microcredit has existed for ages as people lend small loans among each other within communities. However, institutionalized microcredit in its' current form, structure, and mode of operation can be traced to the 1970s with the establishment of the Grameen initiative by Mohammed Yunus, the co-winner of the 2006 Nobel Peace Prize.

The benefits of microcredit to small business entrepreneurs have been documented in several studies including Adjei *et al.* (2009), Chen and Ravallion (2010), Fraser *et al.* (2013), Kaboski and Townsend (2013) and Klapper and Dutt (2015). These studies argue that microcredit provides supports to the poor to meet basic needs and also as a safeguard against risks and uncertainties. Microcredit empowers poor women entrepreneurs, improves household socioeconomic wellbeing and income (Fraser *et al.,* 2013; Kaboski and Townsend, 2013). To Klapper and Dutt (2015), access to microcredit leads to women's empowerment and their ability to be part of the household decision making process. Millions of the world's poor who have access to microcredit are able to invest in small businesses to increase production and income, thereby reducing poverty among many in the process. According to Pitt *et al.,* (2006) and Kumar *et al.* (2013), access to microcredit empowers vulnerable and business oriented women to actively participate in economic activities and by so doing stimulate gender equity.

There are also studies that have contested some of these findings and have pointed to the contrary (Dowla and Barua, 2006; Neff, 2009; Karlan and Zinman, 2011; Roodman, 2012) and concluded that microfinance is not a panacea for mitigating the problem of the poor. Neff (2009), for example, found that after eight years of borrowing, 55 percent clients of the Grameen Bank were still not able to meet their basic household needs. To Karlan and Zinman (2011), microcredit can even collapse the business of some clients. The critics of microcredit also argue that, microfinance has failed as a development tool because client often use loans on other activities such as marriage, funeral, and for household consumption without investing in business.

The microcredit industry in Ghana had grown tremendously since the liberalization of the financial sector in the past two decades even though the industry's existence dated to 1955 when missionaries of the Catholic Church established a small loan scheme for an underprivileged community in Upper East Region of Ghana. Prior to 1960, the policy of the state was to provide subsided small loans to the poor because it was believed that lack of financial capital was the main cause of poverty especially in rural communities. The policy could not achieve its goal of eliminating poverty because poor people require other types of financial services in addition to the small loans. There was therefore the need to in-cooperate non-financial services such savings, reinvestment, and business training which are important for proper loan management and utilisation to achieve positive outcomes.

From the later parts of 1960 through the 70s and to the 1980s, provision of microcredit to small business enterprises was largely done through NGOs and Rural and Community Banks who during the period, placed little emphasis on financial sustainability and self-sufficiency. This period was also characterised by heavy reliance on donor aid from development partners as such the lending institutions paid little attention to effectiveness, efficiency, and loans recovery. The next epoch of microcredit evolution in Ghana was from the 1990s and early part of this century when policies were initiated to formalise the microfinance industry. During this period, laws to support the structure and operations of the microfinance industry in Ghana were promulgated (Asiama and Osei, 2007). Ever since, Ghana's microcredit industry has transformed from a non-profit venture to a commercial one and its operation has expanded all over the country. The industry has therefore been mainstreamed into the conventional financial system and is now regarded as one of the sub-sectors of the financial systems in Ghana providing financial capital to the poor.

Practitioners within the microcredit industry believe that the increasing number of microfinance institutions in Ghana is eventually closing the lending gap that had been created by the orthodox financial markets since micro, small and medium scale enterprises can now have access to financial capital on sustainable bases from microfinance institutions. This confirms the significant role microcredit plays in an open economy like Ghana's.

Crop production especially vegetables cultivation like any other economic activities is capital intensive. Vegetable farming requires inputs such as seedlings, fertilizer and agro-chemicals for which some amount of capital is needed. The main economic activity of the people of Ada West District and Ada East District is farming. Therefore, the emergence of the microcredit programmes in these two districts was highly welcomed by the people. Most of the smallholder farmers in Ada West and Ada East districts over the years have relied on microcredit to meet their financial capital needs. However, recent developments in the microfinance industry have been a course of concern among many players of the sector. One critical area of concern was the collapse of hitherto strong microcredit schemes due to:

- Investments in extremely risky assets (long term and very large assets) with the view to make super abnormal profits defeating the initial objective of microcredit as envisioned by Mohammed Yunus; providing short term small loans to micro entrepreneurs
- lending to close associates who invest the loan in unproductive ventures; and
- High rate of default among borrowers due to multiplicity of factors.

The last five years has witnessed the collapse of several microcredit institutions whiles others are in financial distress due to the factors enumerated. The main source of capital for most of the smallholder farmers in Ada West and Ada East districts is microcredit without which farming activities, especially vegetable cultivation, the livelihood activity of the people will come to a standstill, thereby increasing poverty levels within the two districts. An empirical evidence to establish microcredit loan repayment in order to find answers to the sustainability of the microcredit programme in the Ada East District and Ada West District cannot be overestimated. This, therefore is the focus of this paper.

In many microcredit institutions the procedures adopted to advance credit to a would-be-borrower are normally hypothetical and largely depend on past knowledge of the borrower or experience of the borrower rather than on empirical and objective analysis. Nevertheless it must be acknowledged that the decision to lend to the borrower is based on speculations but it is more appropriate if such decisions are based on empirical evidence. The decision to grant credit to a borrower is based on certain criteria such as collateral securities or a deposit from the borrower to achieve maximum repayment. Relying on these criteria to access repayment rates of vegetable farmers in the two districts in Ada may be misleading.

The use of speculative means to make a decision could have severe negative outcome for the microcredit institution. Besides, much can be found in literature on the criteria for lending by microcredit institutions. However, not same can be said for the reasons for failure to repay credit advanced to borrowers, though such defaulters met the minimum lending criteria required by lenders, therefore the need for this study. Using farmer and microcredit specific characteristics such as mode of repayment, interest rate, gender, duration of repayment among others, this study provides empirical evidence as to whether these characteristics impact on the capability of the borrowers to repay the credit advanced to them.

2. DETERMINANTS OF MICROCREDIT REPAYMENT

There are several factors that determine the ability of borrowers to repay the credit advanced to them by the credit providing agency. These factors are discussed below based on previous research. Rural people especially the vulnerable such as women normally have unequal access to credit. The problem is more pronounced in developing countries (Rodriguez, 1995; Yunus, 1995). Studies suggest that small loans available to women can help them invest in income generating activities and improve upon their income. The increase income will enable them to repay the loan with interest (Pitt *et al.,* 2003; Khandker, 2005). It therefore presupposed that gender is an important determinant of the ability to repay microcredit.

While many third-world microcredit borrowers have been able to maintain high repayment rate despite low educational levels, micro entrepreneurs in the United States of America (USA) are faced with different circumstances. Unlike many developing countries, which have demand for products/services produced by micro entrepreneurs, the market demand is high in the USA, products and services offered by micro entrepreneurs is often quiet low. To achieve high returns on their investments and be capable of repaying loans, micro entrepreneurs in the USA need to carved out distinct market niches, compared with the counterpart in developing countries. Borrowers with higher levels of education may have higher repayment rates because they can make better investment decisions (Bhatt *et al.,* 1999).

Micro entrepreneurs often use part of the loan acquired for household needs such as paying for their children's education, medical bills, buying of food and as a security for meeting emergencies or unexpected expenditure. According to Wright (2010), and Mersland and Strom (2011), microcredit clients are risk-averse and do not invest their loan into one enterprise. Other studies that have alluded to microcredit clients using loan for other non-income generating activities include Littlefield *et al.* (2003), Alexander (2006), and Mersland and Strom (2011).

Loan borrowers may use cash inflow from non-farming activities such as money from friends, family members to make loan repayments. Thus borrowers with higher household income from non-farming activities may have a higher chance of repaying their credit. Farmers who have been in farming longer are expected to have more stable sales and cash flow than those who have just started. Thus those who have been in farming for a long period may have a higher tendency to repay the credit facility (Bhatt and Tang, 2002). If a farmer's farm or residence is close to the lender it is easier for the lender to get information to the borrower and to provide him/her with relevant technical or business advice. Thus borrowers with farms or residence closer to the lending agency may have higher repayment rate (ibid)

To access loan, borrowers may incur various types of transaction costs (Bhatt and Tang, 1998). Borrowers may be less able and motivated to repay if they have to bear excessive transaction costs due to complicated loan application and repayment procedure or due to inefficiencies in the lender delivery system, such as missed investment opportunities because of delay in loan disbursement. In such a case if a farmer received the credit late in the farming season he/she may use it on unplanned activities resulting in debt.

Members of a group can bring pressure to bear on individuals to repay their loans in order to protect the integrity of the group to enable the group to access future credit facility. Group members can also check their peers to ensure that they are not engaged in activities that will threaten loan repayment. Thus, farmers who are members of a group/FBO may have a higher tendency of repaying the credit facility advanced to them (Varian, 2010). As demonstrated empirically by Besley and Coate (1995), social sanctions in grouped-based lending can lead to increased repayment rate. Field studies in Burkina Faso further indicated repayments are high when threat of ex post pressure is carried to the extreme, and has even resulted in the forced sales of household items in order to recover the loan amount. In the absence of peer monitoring, peer pressure in the form of verbal abuse, ostracism and sanctions were the strategies to ensure loan repayment (Giné, ;2010Jeffrey and Tyler, 2010). Borrowers usually repay their credit from incomes that accrue from investment of their credit in income-generating activities. Whiles income from non-farming can also help the borrower to repay the credit, Yeboah (2010) argued that the proceeds from the farming activities as a result of the use of the credit is the main source of funds for repayment.

Roslan and Mohd-Zaini (2009) suggested the amount of credit received by beneficiaries influences their ability to repay. Where credit is inadequate farmers are unable to purchase the needed inputs to increase their output hence a low rate of repayment. On the other hand if the credit amount is more than needed by borrower there is tendency of misuse, resulting in debt and poor repayment. It is argued that where borrowers are trained on the use of credit there is efficient use of the funds. This will result in increased yield and for that matter income, *ceteris paribus*. The increase in revenue and profit may help the farmer to repay the credit. Thus, provision of training to borrowers may improve the ability to repay the credit that has been advanced to the farmer. It is argued that older borrowers are wiser and more responsible than younger borrowers. On the other hand, younger borrowers are more knowledgeable and more independent. Hence age might have positive and negative effect on credit repayment rate (Ibid).

Repayment duration refers to the period for which all the entire credit must be repaid. Ledgerwood (1999) observed that cash flow in part determines the debt-servicing capacity of the borrower. Shorter repayment period might cause the borrower not to have generated enough revenue to make credit repayments. On the other hand, longer repayment period might be detrimental to the borrower if they cannot access future loan until the existing credit is paid back. Hence both shorter and longer repayment period can have negative effects on the ability to repay. Field *et al.* (2012) provided empirical evidence to suggest that longer repayment period does not necessarily encourage irresponsible repayment behavior among borrowers. However, Roslan and Mohd-Zaini (2009) provided evidence that longer repayment period increase the probability of default among borrowers whiles analyzing the determinant of microcredit repayment in Malaysia

In their work on loan defaults in Nigeria, Oladeebo and Oladeebo (2008) concluded that, loan quantum received, age, farming experience, use of credit, and level of education were the major significant socio-economic factors determining loan repayment. Borrower's socio-economic factors which did not have significant influence on loan repayment were gross farm income, and cultivated farm size. Their findings suggested that credit should be mostly advanced to middle age and energetic farmers who are more likely to adopt new innovations in agricultural production than their older counterparts. The study emphasized adult education for non-literate farmers because literate farmers are also likely to adopt new innovations which may enhance their income positively.

3. METHODOLOGY

3.1. Study area and data collection
The study was carried out in Ada West and Ada East Districts of the Greater Accra Region of Ghana in 2015. The two districts are predominantly rural districts with farming being the main

economic activity. Available information from the Ada Rural Bank, Alphamaga, and Opportunity International MFIs shows that microcredit loan recovery in the two districts is no more than 83%. Greater Accra Region as a whole is considered a cosmopolitan area where commerce and white collar jobs are the main economic activities thus little attention has been given to empirical research to establish microcredit utilization and repayment among *smallholder farmers* in the region in spite of their presence.

Both quantitative and qualitative data were collected. With the help of microcredit lenders we were able to identify farmers who have accessed microcredit that have either paid in full or defaulted. Since the information, according to the lenders were highly confidential they had to seek the consent of the respondents (defaulters in particular) and upon agreeing before we were given the opportunity to interview them.

From over 3000 smallholder farmer microcredit users, we randomly selected 250 respondents and administered questionnaires to them. But due to outliers and incomplete responses to some questionnaires the study finally used 224 (comprised 120 who repaid loan in full and 104 defaulters). The sample size was based on availability of funds. A structured questionnaire was used to collect data through the interview format. Data were analysed with the STATA statistical software. There were follow ups to validate some of the findings. Tables and charts were generated and analysed descriptively.

3.2. Empirical method of analysing data

The logit model was used to analyse the factors determining loan repayments capabilities among borrowers. The logit model was used because the dependent variable is dichotomous. This implies that during the period of loan repayment if the respondent had difficulties to repay agreed amount at the scheduled time it is indicated zero (0) otherwise one (1) for the dependent variable. We used farmer and credit specific characteristic that could influence microcredit repayment based on theory, literature and prior knowledge of the study areas. Microcredit repayment, the dependent variable is therefore a function of the selected farmer and credit specific characteristics. The farmer and microcredit specific characteristics used and the expected impact on the dependent variable are shown on Table 1. For estimation purpose the logit model is given here as:

$$L_i = \ln(P|1-P) = \beta_1 + \beta_i X_i + \varepsilon_i$$

L_i = Independent Variable
β_1 = Constant
β_i = Marginal Values of the Independent Variables
X_i = Independent Variables
ε_i = Error term

The data was analysed using STATA 14

Table 1: The variables included in model and their predicted impacts

Variable	Symbol	Measurement	Predicted Impact
Level of education	X_1	Dummy (1=JHS; Otherwise=0)	+
FBO membership	X_2	Dummy (1=member of FBO; Otherwise=0)	+
Gender	X_3	Dummy (1=female; otherwise=0)	+
Interest rate	X_4	Percentages	-
Experience in farming	X_5	Years in farming	+
Distance	X_6	Kilometers	+
Perception of pressure from credit institution	X_7	Dummy(1=pressurized to repay; otherwise=0)	+

Repayment duration	X_8	Months	+/-
Age	X_9	Years	+/-
Amount of credit granted	X_{10}	Ghana Cedis	+
Dependants	X_{11}	Number of people farmer is taking care of	+/-
Income	X_{12}	Ghana Cedis	+/-

4. RESULTS AND DISCUSSIONS

4.1. Loan default: farmers perspective

Low prices of farm output accounted for about 43% of the reasons why the farmers defaulted in loan repayment. High interest rate (22%) was the second cause of default whereas poor yield was the least (6%) (Figure 1). It is not surprising that poor yield is the least while 'low prices' is a major factor for loan default. Availability of credit could lead to increased farm size and investment in other income generating ventures. *Ceteris paribus* increase investment in farm operations will lead to increased yield but the increased in yield may result in glut and hence low prices, resulting in income decline and loan repayment challenges. This means provision of credit must be backed with efficient marketing strategy.
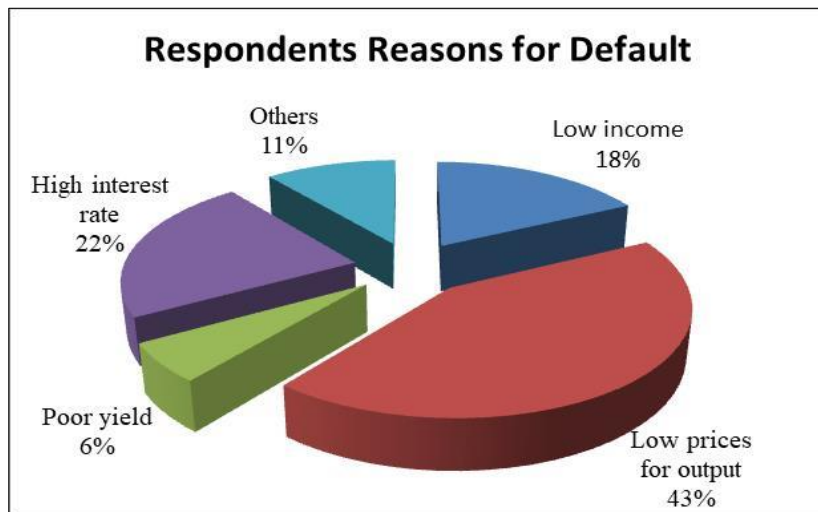

Figure 1: Reasons for non-payment of credit

Source: Field survey data, 2015

4.2. Loan repayment and saving pattern

From Figure 2, 64% of the borrowers paid back their loan from the proceeds of their farms whilst 24% paid from non-farm incomes. Twelve percent (12%) paid the loan from both farm and non-farm incomes. Repayment duration ranges from 6 months to one and half years, suggesting that the loans are for short term financing. Nearly 77% (76.8%) of the farmers saved from their earnings. Savings in the local currency ranged from GH₵ 150.00 (≃ US$ 42.00) to GH₵ 3000.00 (≃ US$ 834.00) with average of GH₵ 240.34 (≃ US$ 67.00). These savings are normally deposited with the various microcredit schemes from which the loan was obtained. The average savings figure is relatively low which may be a sign of poor savings habit or higher consumption pattern of farmers from income that accrued to them. Those who did not save (23%) attributed it to various reasons as shown in Figure 2.
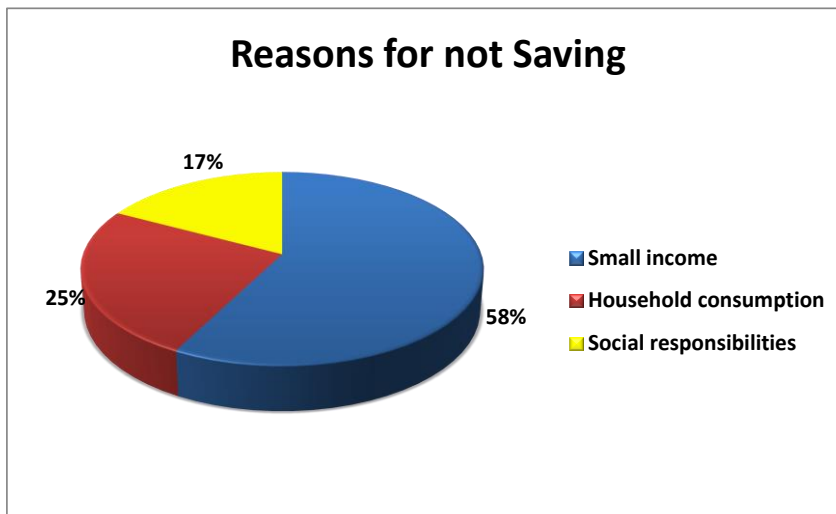
Figure 2: Reasons some farmers could not save

Source: Field survey data, 2015

Low/small income is seen as the main cause of no saving among smallholder farmers. The small income may be due to relatively low prices they might have received for their products. 'Social responsibilities' is the least reason for not savings. MFIs need to encourage their clients to inculcate the habit of saving. Accumulated savings can be used to offset repayment in times of repayment challenges or to mitigate unforeseen economic hardships. Such savings could also be used as collateral for accessing bigger loans.

4.3. Business management training

The lending institutions provided business management training to some of the clients. In Figure 4, 49% were trained on how to follow loan repayment schedules, 38% received training on use of loan and 13% received training on keeping business records. It can be observed in Figure 4 that credit providers are more interested in repayment of the credit advanced to farmers without exerting much pressure on borrowers hence they tend to focus training borrowers more on how to follow repayment schedule to the neglect of record keeping and credit utilisation.
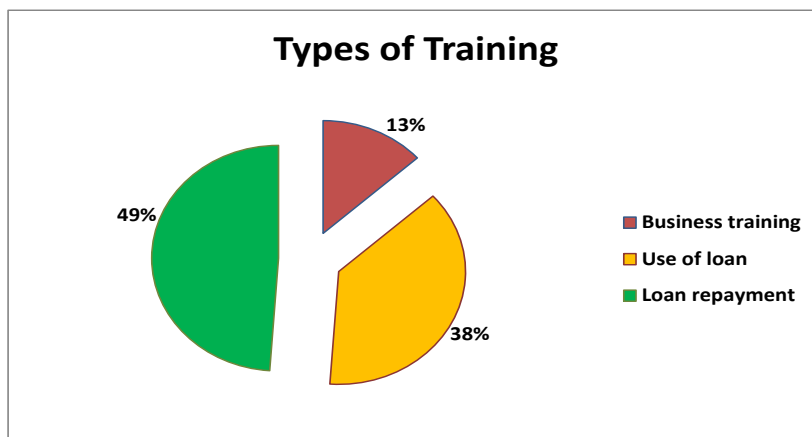

Figure 3: Form of business training offered by lenders

Source: Field survey data, 2015

4.4. Loan fungibility

Loan fungibility is the use of loan for purposes other than the purpose for which the loan was granted. Sixty-nine percent (69%) of the farmers alluded to using part of their credit on other activities instead of investing all in the farming activities. Amount used ranged from GH₵ 50.00 (≃ US$ 14.00) to GH₵ 500.00 (≃ US$ 139.00) with an average usage of GH₵ 125.64 (≃ US$ 35.00). Reasons for using portion of loan on non-income generating activities are distributed in Figure 4.
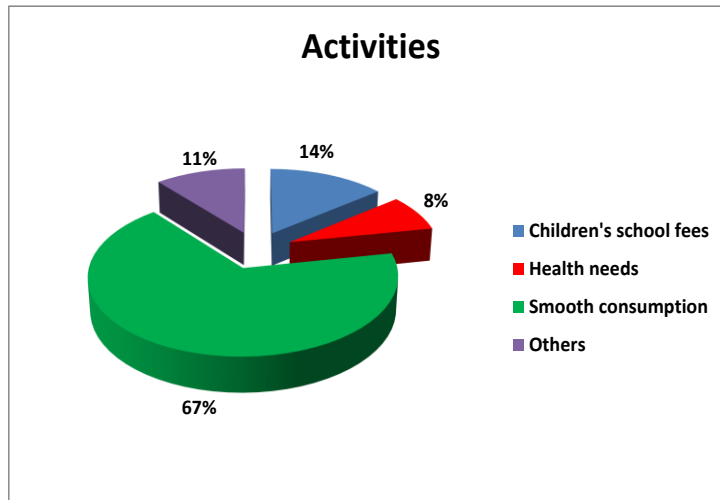

Figure 4: Use of loan for other activities

Source: Field survey data, 2015

Food consumption is critical to the survival of man. In particular, during off-season when farm products become scarce, farmers may rely on credit advanced to them for food. It emerged that 67% of the borrowers who spent part of the credit on non-farm activities used it to smooth consumption (buy food for the household). Need to pay school fees (14%) and hospital bills (8%), and others such as funeral, marriage etc. (11%) were the reasons for using the portion of credit on non-income generating activities. Microcredit given to smallholder farmers is not only used on income generating activities but also non-income generating activities.

4.5. Farmers' perception of delays in loan disbursement

The procedures one has to go through in applying for credit was perceived by majority (64%) of the farmers as the main cause of delays in loan disbursement. Group formation requirement in the view of 19% of farmers delays credit disbursement (Figure 6). This means that loans could be disbursed at any time of the year. Given the seasonal nature of economic activities in the area, granting of loan at any time of the year could mean mismatch between loan disbursement and time of economic activity. This has also been reported in the Eastern Region of Ghana (Tetteh, 2017) and in Bangladesh (Imai and Azam, 2012). Similarly, Ekong and Onye (2013) attributed poor loan performance in Nigeria to mismatch of credit with seasons. Ekong and Onye (2013), and Tetteh *et al.,* (2015) observed that loans disbursement flow to micro and small business enterprises (MSEs) disregarded the seasons and this not only reduce growth and productivity of businesses, but also resulted in poor loan recovery rates.
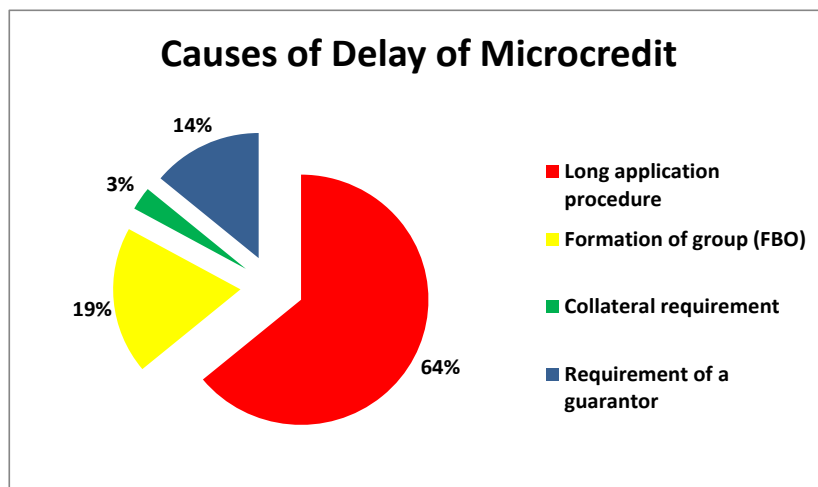
Figure 5: Farmers perception on causes of delay of disbursement of credit

Source: Field survey data, 2015

Requirement of collateral (3%) is perceived the least cause of delay, formation of groups (FBO) (19%) and requirement of a guarantor (11%) came second and third respectively. Formation of FBOs may require time to register and assemble members who may not reside in one community. The fact that fact collateral requirement is the least supports previous findings that most microcredit borrowers are poor and cannot provide collateral to obtain huge sums of loans (Ganle *et al.,* 2015). Loan application process appears to be cumbersome (59%) and this is supported by the fact that 64% of delays in disbursement; long application procedure was perceived to be the cause.

4.6. Determinants of repayment of microcredit

The findings on the determinants of repayment of microcredit are both consistent as well as inconsistent with existing research findings on microcredit. Specifically, the variables age, gender, FBO, experience, dependants, income, interest rate, and repayment period are statistically significant, but pressure, level of education and total credit granted are statistically insignificant. The Pseudo R-Squared of 63.8% suggests that the independent variables explain approximately 64% of the factors influencing the rate of repayment. The model is asymptotically significant at 1% level of significance. A summary of the results is shown on Table 2 and details can be seen in appendix

Table 2: Logistic regression of factors determining repayment of microcredit Dependent variable: repayment ability of microcredit borrowers (Binary)

Variable	Coefficient	Standard Error	P>|z|	Marginal Effects
Education	0.341	0.731	0.642	0.457
Age	0.047	0.033	0.083	0.012*
Gender	0.223	0.578	0.004	0.675***
Distance	-0.004	0.019	0.827	-0.079
FBO	-0.983	0.504	0.001	-0.430***
Experience	-0.054	0.040	0.013	-0.006**
Dependants	0.249	0.128	0.052	0.156*
Income	0.002	0.005	0.004	0.053***
Pressure	0.295	0.643	0.646	0.001
Interest rate	-5.215	0.759	0.000	-0.443***
Quantum of loan	0.231	0.143	0.335	0.321
Repayment duration	-0.311	0.032	0.049	-0.271**

Constant	-1.369	1.245	0.271

No. Objs. =224;   Wald Chi^2(10) =46.12;   Prob>Chi^2 =0.000
Log LH   =-38.918;   Pseudo R^2 =0.638

*** Significant at 1%; ** Significant at 5% and * Significant at 10%
Stata Results of Survey Data, 2015

Education
From the model, level of education has a positive relationship with repayment. This implies that the higher the level of education of the farmer, the higher the probability of repayment. The marginal effect of 0.46 implies that an educational level up to JHS (Junior High School) increases the likelihood of repayment by 46%. The result is, however, statistically insignificant.

Age
Age, influences repayment in the positive direction. It is significant at 10% with a marginal value of 0.012. This implies that, the probability of repayment increases by 1.2% as age increases. These results corroborate to Karlan and Valdivia (2011), who observed improvement in loan repayment among microcredit clients in Peru and associated the improvement partially to experience in terms of age on the business. It must be, however, noted in the case of farmers, age will reach a peak and the marginal effect begins to decline thereafter because the strength to tilt the soil for farming generally declines after a certain age. Old age could render the farmer inefficient which could result in poor yield and income thereby leading to non-repayment of the credit *ceteris paribus*.

Gender
There is a positive and significant relationship between gender and repayment of microcredit. It has a marginal value of 0.68 and significant at 1% level of significance. In this study gender is dummied 1 for female. Given that the smallholder farmer or borrower is a female, the probability of repayment increases by 68%. This suggests that women are meticulous users of microcredit as compared to their male counterparts. The finding is corroborate the study Chakravarty and Pylypiv (2015) who found that women are better managers of microcredit and are less likely to default (Imai and Azam, 2012; Banerjee *et al.,* 2015; Ganle *et al.,* 2015). The result met the a priori expectation.

Distance
That the distance from the farmers' residence to the place of the credit granting agency is insignificant in the model but with a negative relation with repayment is consistent with other microcredit studies (Alexander, 2006; Giné, and Karlan, 2011; Roodman, 2012). This result echoes the Grammen Banks principle of the need to take microcredit facilities closer to the rural poor. None of the MFIs in the study area was engaged in mobile banking. Mobile banking is however available in some communities where loan officers transact business at the borrowers' doorstep. Being closer and spending less time commuting to the lender, gives the farmer more time for farm activities. It also enables the lenders to get quick information on farm needs and challenges for prompt technical advice. As distance increases by a kilometer the probability of default increases by 8% as depicted by the marginal value of -0.08 (Table 2). Proximity therefore reduces transaction cost and increases farmers' chance of repayment

FBO
There was a negative relation between repayment and membership of FBO. The model showed a marginal value of -0.43 and significant at 1%, implying that being a member of FBO increases the probability of default by 43%. This is contrary to the expectation that members of the group will bring pressure to bear on group members to repay their loans in order to benefit from the dynamic incentive strategy where group loans were increased after every successful loan cycle (Breza, 2012). Group members unanimously can agree to default if the groups have a strict joint liability. In this context borrowers are not individually held liable for default. This result is consistent with

Giné and Karlan (2011). It, however, contradicts the findings of Breza (2012). The inconsistency in the findings could be attributed to differences in economic and socio-cultural practices in the study areas and the methods used to analyse data.

Interest rate

As predicted, interest rate has a negative relationship with microcredit repayment. The logistics model showed a marginal effect of -0.44 and statistically significant at 1% level of significance. This means that a unit increase in the interest rate increases the probability of default by 44%. The issue of the interest that microcredit clients pay on their loans had been a critical issue in microfinance programme design (CGAP, 2010; Rosenberg et al., Very often .(2013, the seemingly high interest rates compared to normal commercial lending rates, are the strongest point of criticism for opponents of the microfinance concept. According to Oliver et al. (2007) administrative costs for individually tailored microloans are much greater than for normal standardized loans. Therefore, micro-lending cannot be sustainable without charging interest rates that are higher than what commercial banks normally charge.

Roodman and Uzma (2006) and Waterfield (2012) justified higher interest rates for MFIs on the basis of complex labor-intensiveness, documentation and provision of the credit, remote location of the clients as well as frequent meetings with MFI's staff during approval and repayment process. For instance, lending GH¢10,000 in 100 loans of GH¢100 is obviously more expensive concerning staff salaries etc., than giving out one single loan of GH¢10,000 to an individual. It is also argued that MFI high interest rate makes it possible to grow the microfinance industry by expanding outreach in breadth and depth (Rosenberg et al., 2013). Although the farmers perceived the interest they paid on the loan to be high, it was far less expensive to borrow from the microcredit programme than from local moneylenders whose interest rates range from 50% to more than 100%. To most of the farmers, microcredit was the only opportunity to get money for their farming activities and so they preferred its sustainability to the actual cost of the credit. It was one of the reasons why they took the loans in spite of the interest. As indicated in Bateman (2018), extremely high interest which are charged microcredit borrowers are very inimical to the poor whose interest microcredit is supposed to serve.

Dependants

At 10% level, the model showed a positive and significant relationship between repayment rate and number of dependants. The marginal value is 0.16, implying that the probability of repayment increases by 16% with a unit increase in the numbers of dependants. Poor people's ability to repay loan is expected to correlate positively or negatively with number of dependants. This study has shown that the higher the number of dependants, the higher the chance for the borrower to repay the loan. This is possible with microcredit clients who are farmers. The reason being that the farmer may use the dependants as farm labours to increase farm size and productivity at lower cost. There will be increase in income to enable loan *ceteris paribus*.

Experience

The logistic result showed a negative relation between repayment and experience in farming which is significant at 1% level and a marginal value of -0.01. This suggests that as experience increases the probability of the farmer defaulting increases by 1%. This finding is contrary to several microfinance studies (Field and Plange, 2007; Oladeebo and Oladeebo, 2008; Gerald and Obuobie, 2010; Bichanga and Lilian, 2013) which posit that clients with longer periods of participation have higher repayment rates. Oladeebo and Oladeebo (2008) for instance, examined socioeconomic factors influencing loan repayment among small scale farmers in Ogbomoso agricultural zone of Oyo State of Nigeria and revealed that 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. It is possible that experienced farmers in this study were

the very old ones with smaller farm sizes, low output and small income resulting in their susceptibility to default.

Perception of pressure

As expected the perception of pressure though not significant increases the probability of repayment by 0.1%. This may be so if the farmers do not like to be constantly harassed by credit providers since it may be disgraceful to their households. In a study in Lima referred to as *"Microfinance Games"* Giné *et al.* (2010) found that microcredit borrowers who defaulted were ostracized by their peers, and threated of court actions which influenced repayment.

Total income

Income as a factor that determines the ability to repay the microcredit advanced to the farmers in the study area met the a priori expectation. It has a positive relationship with ability to repay the credit and significant at 1%. It increases the ability to repay by 5.3% because it has a marginal value of 0.053. Rise in income can influence savings and loan repayment.

Quantum of loan/Total credit granted

Usually, the quantum of loan received and ability to repay is expected to correlate in both positive and negative directions. This is because on one hand, too much credit may lead to abuse and repayment challenges. On the other hand, too small credit even though not adequate for the farmer, can be easily paid. The study revealed a positive relationship between the quantum of credit received and the ability to repay with a marginal value of 0.32. This implies that a unit increase in the quantum of credit will result in 32% likelihood of repayment. The reason is that the bigger the loan, the higher the opportunity to invest more in the farm (purchase more inputs and increase farm size). *Ceteris paribus* this will increase productivity and farm returns, thus facilitating repayment with ease. This relationship is, however, statistically insignificant.

Repayment duration

The model depicts negative relationship with the rate of repayment. This is significant at 5% level with a marginal effect of -0.27, implying that, the probability of default rises by 27% as repayment duration increases. This finding corroborate to Roslan and Mohd-Zaini (2009) observation after analyzing the determinant of microcredit repayment in Malaysia. The finding is ironic, given that microcredit clients usually complain about short periods of repayment yet, from this study, an increase in the repayment duration increases the probability of default. Long repayment duration can lead to irresponsible behavior on the part of borrowers. According to Ledgerwood (1999), short repayment periods not only enhances microcredit repayment but ensures the sustainability of MFIs as well. Indeed, short repayment schedules limited the types of activities and investments that can be financed by micro loans. Certain businesses have long gestation period and do not yield returns immediately to allow regular repayment directly after credit disbursement. Perhaps, this was the reason why some farmers were found to have repayment challenges as farm products takes some time to mature compared to artisans and shopkeepers whose businesses yield daily income. Table 2 in appendix shows details of the regression results.

5. CONCLUSION AND RECOMMENDATION

Loan default is one of the critical issues of the microfinance industry. High loan default rate is the primary cause of the failure of many MFIs (Papias and Ganesan, 2009; Mason, 2014). Microcredit lenders rely mostly on speculative methods to advance loans to borrowers which are usually not objective and may produce adverse or negative outcomes. This study analysed the factors that determine microcredit repayment among smallholder farmers in Ada West and Ada East districts in the Greater Accra Region of Ghana using data from 224 households of smallholder farmer microcredit beneficiaries. The logit model was used to estimate the socioeconomic and credit specific characteristics that determine ability of farmers to repay the credit advanced to them. The

result showed that, gender, age, level of education, income, number of dependants, perception of pressure from the credit granting agency and quantum of loan/total credit granted relate positively with rate of repayment. On the other hand, distance from farmers residence to the credit scheme, experience, repayment duration, interest rate and membership of farmer based organization requirement were negatively related to rate of repayment. Income, membership of FBO, interest rate, gender, age, experience and number of dependants were positive and statistically significant. Whereas membership of FBO, experience, interest rate, and repayment duration exert statistically significant negative effect on repayment rate, age, gender, number of dependants, and income influence repayment positively. Overall, the study found that client characteristics are core factors that MFIs need to scrutunize well to prevent loan loss. Therefore, to limit loan default rate, there is the need for effective examination of potential farmer borrowers before releasing credit to the applicants.

Based on the findings, it is recommended that MFIs should institute measures to reduce interest rate by introducing mechanism to reduce operational costs to reduce cost of borrowing. MFIs should give adequate loan to women because they have higher probability of repayment. Credit should be disbursed in a timely and appropriate manner to prevent loan use for unproductive ventures. Training of farmers on credit management and investment should extend beyond what currently pertain; following repayment schedule. Repayment duration should be adjusted to suit individual needs than a wholesome or fixed duration for everyone. Finally, microcredit borrowers should use loan for the purpose for which the loans have been applied for and given because, using loan for other purposes often result in repayment challenges.

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Appendix

Logit model estimation of determinant of repayment

No. Objs. =224
Wald Chi^2(10) =46.12
Prob>Chi^2 =0.000
Log LH =-38.918
Pseudo R^2 =0.638

Variable	Coefficient	Standard. Error	Z	P>|z|	[95% Conf. interval]	
Education	0.3414	0.7314	2.23	0.642	0.4354	-0.0042
Age	0.0474	0.0331	1.43	0.083	-0.0019	0.2335
Gender	0.2237	0.5783	0.52	0.004	-0.3544	0.1144
Distance	0.0042	0.0193	0.61	0.827	0.2689	-0.6451
FBO	-0.9831	0.5040	-2.45	0.001	0.1345	1.4692
Experience	-0.0546	0.0401	-2.07	0.013	-0.5130	1.6316
Dependants	0.2499	0.1284	1.56	0.052	0.6223	1.567
Income	0.0002	0.0005	3.01	0.004	0.1335	1.2982
Pressure	0.2957	0.6432	0.89	0.646	0.6671	0.9254
Interest rate	-5.215	0.7591	-4.21	0.000	0.0852	-2.45
Total credit	0.2316	0.1426	3.21	0.335	0.0089	1.4223
Repayment duration	-0.3113	0.0032	-6.39	0.0491	0.6345	2.6672
Constant	-1.3697	1.2450	-7.03	0.271	0.5612	8.6324

Marginal effects after logit estimation

y = Pr(Repayment) (predict)= .70724532

Variable	dy/dx	Std. Error	z	P>|z|	[95% Conf. interval]		X
Education	0.457	0.2314	2.03	0.602	0.4134	-0.0024	0.6683
Age	0.012	0.1431	1.12	0.091	-0.0016	0.1835	0.3032
Gender	0.675	0.1582	0.02	0.008	-0.2353	0.1374	0.2457
Distance	-0.079	0.0184	-0.32	0.625	0.2485	-0.5441	0.3243
FBO	-0.430	0.1040	-3.85	0.021	0.2345	1.0691	3.2241
Experience	-0.006	0.1401	-2.56	0.019	-0.4330	1.0376	0.5157
Dependants	0.156	0.1364	1.06	0.012	0.6401	1.268	0.4454
Income	0.053	0.0031	2.43	0.001	0.1155	1.0882	0.1073
Pressure	0.001	0.1534	0.59	0.246	2.6371	0.6252	14.8634
Interest rate	-0.443	0.2217	-4.07	0.006	0.0892	-2.245	0.1662
Total credit	0.321	0.1322	4.12	0.434	0.0083	2.4123	2.1321
Repayment duration	-0.271	0.0233	-4.33	0.041	0.6185	1.7322	0.6834

(*) dy/dx is for discrete change of dummy variable from 0 to 1