THE IMPACTS OF A MICROFINANCE LENDING SCHEME ON CLIENTS IN GHANA

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ABSTRACT

Owning to the success of the Grameen Bank and other microfinance institutions in recent years, microfinance institutions' role as a potential policy tool in poverty alleviation has received considerable attention. Empirical evidence from existing research shows some positive results in poverty reduction from some microfinance programs. This paper adds to existing literature on the industry by evaluating the effects of microfinance on clients who have received loans from the Sinapi Aba Trust of Ghana. Our data show that earlier clients in the program received greater impacts and are more empowered from the program than new clients, even though the latter on average receive larger volumes of credit. We construct empowerment indicators, finding that years of membership duration with the SAT lending scheme matters in empowering clients. The results show that old clients are more likely to purchase assets, expand their businesses, and spend larger amounts on their children's education than new clients.

JEL: G23, O16

KEYWORDS: MFIs, Credit, Impact, Assets, Income

INTRODUCTION

Following the perceived success of microfinance institutions (MFIs) in recent years, the role of MFIs as a potential policy device for poverty reduction has increased in many countries around the world. Empirical evidence from existing research shows some positive results from various microfinance schemes (see for example Hashemi, et. al, 1996; Pitt and Khandker, 1998; Pitt et al, 2003; Pitt et. al, 2006; and Maldonado and Gonzales-Vega, 2008**)**. In contrast, other findings shown negligible and even negative impacts, and suggest that most MFIs are profit oriented and aim at their own financial sustainability (see Goldberg, 2005 for a review). They do not benefit the poorest of the poor **(**Amin et al, 2003**)**.

This paper is centred on interviews conducted with clients of the Sinapi Aba Trust (SAT) which, is a major microfinance institution in Ghana. Among the aims of SAT is to provide financial services to vulnerable but industrious people. SAT employs group-based lending. As such, the loans are 'collateral-free' in the conventional sense. Of course, under this method, group members' are 'collectively responsible' should a member default, and they accordingly act as peer monitors. The SAT solidarity groups range in size from 2 to 38 members. SAT does lend to individuals. However, we did not interview any client who procures individual loans because the group-based clients outnumbered the individual clients by a great margin, and are easily located, unlike individual clients, during weekly or biweekly community meetings.

To effectively explore and evaluate the impact on microfinance clients, data was collected between July and September 2009 from clients of SAT. In addition to clients depicting a spirit of entrepreneurship, they have been empowered in other areas. We used the cohort approached to classify clients into two groups: old and new clients. Old clients are defined as clients that had borrowed from the SAT more than three years and new clients as less than three years with the scheme. The data analysis shows that even though

new clients on average have received bigger loans, old clients have greater benefits in income earned and other factors.

Furthermore, we constructed empowerment indicators from the survey instrument similar to Hashemi et. al, (1996); and Garikipati (2008)., and found that *old clients* of the MFI have received greater impact than *new clients*. They have greater benefits in areas such as asset ownership, increased expenditure on food and children's' education, improvement in business operations, economically secure and in the overall empowerment. We used the constructed indicators as independent and dependent variables to run logistic regression to determine the effects of the independent variables on the dependent variables.

Literature in the field suggests that while some MFIs are making positive impact in the lives of their clients, others are not. One of the most difficult but profound questions in the microfinance industry is whether it 'works' or not — which, as Odell (2010, p.6) noted, is a complex question to answer. The difficulty arises from two factors. First, microfinance comprises not just a simple tool, but rather a compilation of products and methods. Second, microfinance programs operate in very different environments in Asia Africa, Eastern Europe and Latin America. Hence, it is not surprising that findings from impact assessment studies have yielded mixed results (Meyer, 2007).

The primary aim of this study, in taking the debate further, was to examine the impact of a microfinance institution that uses group-based lending to clients in Ghana. Findings of the study are consistent with findings of other studies on group-based lending programs such as Pitt and Khandker (1998); Pitt et al. (2003); Amin et al. (2003); Coleman (2006**);** Pitt et al. (2006); and Maldonado and Gonzales-Vega (2008).

This study has been organized into five sections. The next section briefly reviews the literature on the group lending methodology. This is followed in Section 3 by the details of the data used for the study and how we deal with selection bias which is a nadir in most impact assessment studies. Before we run the regression model and discuss empirical results in Section 4, we describe the variables and show how we constructed then from the survey instrument. We also discuss how some of the questions were reduced to dichotomous variables to allow us run the logistic regression model. Concluding remarks are ventured in Section 5.

LITERATURE REVIEW

The term 'microfinance' refers to the provision of diverse financial services to people who may have no access to such financial services from formal banks. These financial services often go beyond providing credit (see Rhyne and Otero, 2006; Maes and Foose, 2006). Since formal financial institutions do not provide loans to such poor people, not the least due to a lack of collateral, MFIs have developed various innovations in lending that reduce not only riskiness, but also the cost of making small loans without depending on collateral (Morduch, 2000). The methodologies deviate from formal banking institutions operations in offering financial services and in other ways (Morduch, 1999). There abound impressive theoretical and empirical literature supporting peer lending in Stiglitz (1990), Besley and Coate (1995), Ghatak (1999), Armendáriz de Aghion and Gollier (2000), Laffont and N'Guessan (2000), Armendáriz de Aghion and Morduch (2005), Bhole and Ogden (2010). In recent years, however, due to the rigid nature of group lending, the Grameen Bank (the erstwhile great populariser of group lending) has restructured its methodology and no longer lends exclusively to groups.

Empirical evidence abounds on microfinance schemes impacting positively on the lives of their clients (see for example, Pitt and Khandker, 1998; Morduch, 1999; Smith, 2002; Pitt et. al, 2003; Amin et.al, 2003; Pitt et.al, 2006; Karlan, 2007; Maldonado and Gonzales-Vega, 2008). However, there are still inadequate studies on the impact assessments of microfinance schemes; and, few have accounted for

selection bias, where accounting for fungibility of funds remains a major issue (Hulme, 2000). To avoid the tendency for impacts to be exaggerated this study accounts for selection bias. For positive impact on employment creation, regular income generation, and consumption smoothing see Pitt and Khandker (1998), Khandker (2005), Maes and Basu (2005) and Hartarska and Nadolnyak (2008). Also for impact on improvements in children's education see Maldonado and Gonzales-Vega (2008), Pitt and Khandker (1998). On assets and empowerment see Cheston and Kuhn (2002), Hashemi et. al (1996), Pitt, et.al, (2006) and, Pitt and Khandker (1998)

DATA AND METHODOLOGY

We carried out the field work for this study in Ghana from July to September 2009 via interviews with 672 SAT borrowers from three of its branches. We selected clients randomly during community meetings at several centres of the branches. The gender composition of clients in the data is 87 percent female and 13 percent male. We deal with selection bias, a major problem that researchers encounter in impact assessment next.

As argued by Maldonado and Gonzales-Vega (2008), the inclusion of clients and the selection of program venues are some of the sources of worry in impact assessment studies. Clients are not randomly selected; as such members of the program and non-members may differ in several ways. For example, unobserved characteristics may account for the reasons why some people participate and others do not. In order to circumvent or curtail the effects of selection bias in any assessment study, such main endogeneity concern should be considered (Pitt and Khandker, 1998; Maldonado and Gonzales-Vega, 2008). Again, since placement of programs is not random, but based on certain criteria used by program officials, unmeasured local factors like infrastructural services and household characteristics, could affect program participation (Maldonado and Gonzales-Vega, 2008).

They grouped the sample into 'old' (more than one year) and 'new' (less than one year), and controlled for the unobserved characteristics that influence program participation. They opined that, after controlling for individual and local variables, differences in schooling gap between the children of the two groups of clients that emerged can be acknowledged as rational program impact. The suitability of this approach, however, depends on the nonexistence of systematic differences between the two groups of clients. They tackled the problem using two approaches. Firstly, they investigated the screening criterion by the institutions, and secondly, they applied the data set to demonstrate that there were no significant differences between important characteristics of the groups.

In order to control for any possible unobserved characteristics that may influence program participation, we divided the sample into two groups — old (over three years) and new (under three years). The differences in impact of the program between the two groups of clients in our study can be categorized as program outcomes, just as we expect that the regression models are not biased. We therefore expect that asset purchases (for example), by clients would be greater for old members. We held discussions with both program officials and clients, and found that continual screening of clientele for lending, and entry into the scheme depends on agreements with other members in the group. In addition, the program communities have similar characteristics; they are all located in poor urban communities. We also analyzed the individual characteristics of the sub-sample of the two groups of clients; and are virtually the same.

A critical analysis of the loan statistics show that SAT practices progressive lending, and that on average, new clients received higher loans than old clients. However, for new clients, their mean monthly income was GH¢116.09 before they joined the scheme, and increased to GH¢176.32 after they joined the program (an increase of about 52 percent). In contrast, that for 'old clients' was GH¢337.68 and GH¢594.01 respectively (an increase of almost 76 percent). This suggests greater impact for old clients.

Description of Variables

We investigate the impact of credit on clients using the logit model on empowerment indicators constructed. These indicators have been designed similar to the indicators used by Hashemi et. al (1996); and Garikipati (2008). We constructed the indicators for analysis from some of the clients' answers to specific questions. Following Hashemi et. al (1996) and Garikipati (2008), we assigned equal weights to each component if a client satisfies a set of selected conditions; this was intended to minimize the issue of subjectivity. The outcome variables employed in our data for empowerment were reduced to dichotomous variables (a score of zero or one) for the analysis. This allowed us to use the logit regression model for our estimates (see Amemiya, 1981; Hosmer and Lemeshow, 2000). We describe the variables below.
First in the series are dependent variables which we have called empowerment indicators. In this study, we looked at empowerment as being: able to own assets; able to spend on child education; improve or expand business; and is economically secure in the future. Hence, as clients receive loan from the scheme, it enhances their empowerment, and this we analyzed in the Ghanaian context.

a) *Asset Ownership* (ASSETS): Great respect is attached to asset ownership in Ghana — from 'minor' personal durable properties such as clothing to 'major' properties such as a house and many more. The definition of assets here includes property of any form that a borrower purchased after he or she joined the scheme. Clients who have purchased assets of any form were coded 1 and 0 otherwise.

b) *Improvements in Business* (IMPBUS): Clients' empowerment is also linked to acquiring an asset for business use. We asked clients about the use(s) of asset(s) they purchased after they joined SAT. Clients who use the purchased asset for business purposes were coded 1 and 0 otherwise.

c) *Expenditure on education (*EDUEXP): Another indicator we used is expenditure on childrens' education. A score of 1 was awarded a client with expenditure on education otherwise 0.

d) *Economic Security in the Future* (ECOSEC): Respondents rated their i) economic security, ii) future prospect, iii) respect level in society, iv) self confidence and v) participation in decision making, on a five point scale from very high (1), high (2) to very low (5) before and after they borrowed from SAT. If economic security became better after they joined the scheme (a score of 1 or 2), compared to a pre-scheme membership situation (a score of 3, 4 or 5), then 1 point was awarded otherwise 0. We used the same criterion to award points to the clients for all items. A respondent with a total score of three out of the five items was coded 1, and otherwise 0.

e) *Composite empowerment* (EMPOWER): A client was classified as empowered and coded 1, if for all the (4 indicators here) he or she has a score of 3 or 4 and 0 otherwise.

Second in the series are independent variables; these have been divided into three: namely. Program variables, household characteristics and respondents' characteristics. The first program variable is *Number of years with SAT* (SATDUR). Clients who have borrowed for over three years were classified as 'old clients', and those with less than three years as 'new clients'. 'Old clients' were coded 1 and 0 otherwise. *Average loan size received by a client* (AVLOAN) is the second variable related to the program. Clients average loan received was computed by dividing total loan received by number of loan(s). The last program variable is *Before SAT loan* (LBSAT). Clients who took loans from other sources before they joined the program were coded 1, and 0 other wise.

We had two variables related to household characteristics. The *Head of household gender* (SEXHH); female household heads were coded 1 otherwise 0. The second was the *Household size* (HSIZE); thus, we recorded size of the household for each client and used it as independent variable. Also, respondent's characteristics composed of two variables. They are *Respondent's age* (RESAGE) and *Respondent's*

education (RESEDU). The latter we coded as a categorical variable. It takes the value of 1, 2, 3 and 4 (where 1 represents no schooling years, 2 represents basic schooling of up to 10 years, 3 symbolizes secondary schooling, between 10 to 13 years, and 4 corresponds to tertiary education, over 13 years of schooling). A summary statistics of the data is presented in Table 1.

Table 1 Descriptive Statistics for the Variables

Description of variables	Mean	Standard deviation	Minimum	Maximum	Number of observations
		Dependent variables			
Vulnerability indicators					
FDEXP	0.380	0.486	0	1	672
LVHD	0.690	0.462	0	1	671
ABSAVE	0.700	0.460	0	1	672
NTVULN	0.670	0.469	0	1	671
Empowerment indicators					
ASSETS	0.390	0.488	0	1	672
IMPBUS	0.260	0.440	0	1	672
EDEXP	0.440	0.496	0	1	672
ECOSEC	0.640	0.481	0	1	672
EMPOWER	0.270	0.445	0	1	672
		Independent variables			
Program variables					
SATDUR	0.180	0.318	0	1	672
AVLOAN	559.747	329.906	80.00	4933.330	672
LBSAT	0.250	0.435	0	1	672
Household characteristics					
SEXHH	0.320	0.465	0	1	672
HSIZE	4.28	1.839	1	10	669
Individual characteristics					
RESAGE	40.210	8.498	21	65	672
RESEDU	2.63	0.815	1	4	672

This table presents descriptive statistics of the sample.

EMPIRICAL RESULTS: EFFECTS OF CREDIT ON THE EMPOWERMENT INDICATORS

Table 2 presents the effects of the independent variables on the indicators; it reports the odds ratios, and the confidence intervals for the odds ratios. Each dependent variable estimates a separate equation. Generally, when an odds ratio of an independent variable is greater than 1, it shows a positive relationship with the dependent variable. In contrast, an odds ratio less than 1 shows a negative relationship between the variables. Statistical significance ($p < 0.05$) is shown when 1 falls outside the confidence interval of the variable (Hashemi et. al, 1996).

The column in Table 2 under ASSET estimates the regression equation using the logit model:

$$ASSETS = \alpha + \beta_1 SATDUR + \beta_2 AVLOAN + \beta_3 LBSAT + \beta_4 SEXHH + \beta_5 HSIZE + \beta_6 RESAGE + \beta_7 RESEDU + ui \quad (1)$$

where *ASSETS* asset ownership; *SATDUR* is membership duration or number of years with SAT;

AVLOAN average loan size received by a client; *LBSAT* took loan before joining SAT; *SEXHH* head of household gender of the client; *HSIZE* the size of a client's household; *RESAGE* age of the respondent; *RESEDU* education level of a client; α is the intercept; the βs are coefficients of the variables; and ui represents unobserved characteristics.

The odds ratio for membership duration (SATDUR) is 5.15 and it is statistically significant at the 1 percent level. This suggests that 'old clients' are 5.15 times more likely to own assets than 'new clients' in the sample. This result is similar to most findings in the literature where microfinance clients increase their asset ownership over the years (see Pitt and Khandker, 1998; Hashemi et. al, 1996; and Garikipati,

2008). It shows that old members of the scheme are 5.15 times more empowered in terms of assets ownership than new members, hence the longer the years a client borrows from the scheme, the more assets the client is likely to purchase. Again, the odds ratio of average loan received is 1.00068, and it is statistically significant. Other significant variables are loan before SAT and the age of respondents; however, the other variables are negatively related.

The column under EDEXP in Table 2 estimates the effects of the dependent variables on education expenditure using the logit regression:

$$EDEXP = \alpha + \beta_1 SATDUR + \beta_2 AVLOAN + \beta_3 LBSAT + \beta_4 SEXHH + \beta_5 HSIZE + \beta_6 RESAGE + \beta_7 RESEDU + \iota ri \quad (2)$$

Table 2: Effect of the Independent Variables on the Empowerment Indicator, Reporting Odds Ratio from Logistic Regression Models (N=672)

	Dependent Variables				
Independent Variables	**ASSET** **Odds Ratio**	**EDEXP** **Odds ratio**	**IMPBUS** **Odds ratio**	**ECOSEF** **Odds ratio**	**EMPOWER** **Odds Ratio**
SATDUR	5.146 ((7.04)[a] *	2.248 (3.57)***	3.423 (5.52)***	0.5446 (-2.51)**	3.374 (5.52)***
AVLOAN	1.001 (2.46)**	1.001 (2.55)**	1.000 (1.49)	1.000 (3.70)***	1.001 (2.43)**
LBSAT	1.247(1.09)	0.5432 (-2.90)**	1.118 (0.51)	0.0817 (-10.87)***	1.053 (0.49)
SEXHH	0.6217 (-2.29)***	3.018 (5.24)***	0.8133 (-0.93)	0.5614 (-2.65)***	0.727 (-1.44)
HSIZE	0.902865 (-1.83)*	1.617 (7.97)***	0.9524 (-0.81)**	0.9094 (-1.59)	1.014 (024)
RESAGE	0.9534 (-4.13)***	0.9731 (-2.38)	0.9647 (-284)***	1.013 (1.04)	0.9722 (2.28)**
RESEDU	1.079 (1.10)	0.8745 (-1.19)	1.353 (2.43)**	0.8692 (-1.17)	1.209 (1.59)
Log likelihood	401.74	402.48	-359.21	-352.66	-366.86

Notes to the table: Each column estimates a separate equation. When odds ratio is greater than 1, it indicates positive relationship between the variables, when it is less than 1, it shows a negative relationship. As the results suggest, membership duration is significant at 1% for all the variables but ECOSEF. We see that membership duration is an important factor in determining the impact of the lending program. Z-statistics are given between parentheses. *** ,**, and * indicate significance at the 1,5, and 10 percent levels respectively.

where EDEXP represents education expenditure of a client; and α, the βs and ιri are as defined before. With the support of MFIs, most clients spend more on their children's education. This comes in two ways. Clients make additional expenditure on children who are already in school, or clients enrolled more children in school due to increased income. Significant variables positively related to this are membership duration, gender of household head, and household size. Pre-SAT loan and clients' age are also significant but negatively related. Central to this paper, our results show that the odds ratio for membership duration (SATDUR) is 2.25; this suggests that 'old clients' are 2.25 times more likely to spend on their children's' education than 'new clients'. This is similar to what Maldonado and Gonzales-Vega (2008) found in Bolivia.

The odds ratio for household head is 3.02 and statistically significant. It suggests that female household heads are 3.02 times more likely to spend on their children's education than their male counterparts.

One major aim of microfinance institutions is to help their clients move out of poverty by providing them with credit to expand their economic activities. It is therefore in line with this objective if clients take the credit and use it to improve their businesses. Here we estimate the latent variable with the logit equation below:

$$IMPBUS = \alpha + \beta_1 SATDUR + \beta_2 AVLOAN + \beta_3 LBSAT + \beta_4 SEXHH + \beta_5 HSIZE + \beta_6 RESAGE + \beta_7 RESEDU + \upsilon i \quad (3)$$

Where IMPBUS is the improvements in business resulting from asset purchase, and α, the βs and υi are as defined before.

The major aim of MFIs is to help their clients move out of poverty as they give them credit to expand their economic activities. Positively related significant variables are membership duration and the education level of clients. Our results suggest that old members of the program are 3.42 times more likely to improve upon their businesses than new members. The results also suggest that a client with high level of education who is an old member is more likely to improve his or her business than a less educated client.

We looked at the clients' self-confidence, economic security, the level of respect they have, participation in decision-making and their perceived future prospects, since most microfinance clients claimed to have become better off in these areas which we called ECOSEC. The effects on ECOSEC are estimated using the equation:

$$ECOSEC = \alpha + \beta_1 SATDUR + \beta_2 AVLOAN + \beta_3 LBSAT + \beta_4 SEXHH + \beta_5 HSIZE + \beta_6 RESAGE + \beta_7 RESEDU + \upsilon i \quad (4)$$

Where ECOSEC is a respondent's economic security, and α, the βs and υi are as defined before.

It is important to be economically secure in everyday day life, and we asked our clients to indicate their perception of economic security. The results indicate that average loan size, is positively related and statistically significant; whereas membership duration (SATDUR) is statistically significant but negatively related.

We next look at the composite empowerment (EMPOWER) which we derived from the four indicators (ASSETS, EDEXP, IMPBUS, and ECOSEC), Equation 1.5 presents the effects of the independent variables on the composite empowerment estimating the logistic equation:

$$EMPOWER = \alpha + \beta_1 SATDUR + \beta_2 AVLOAN + \beta_3 LBSAT + \beta_4 SEXHH + \beta_5 HSIZE + \beta_6 RESAGE + \beta_7 RESEDU + \upsilon i \quad (5)$$

where EMPOWER is the empowerment derived from: ASSET purchased, expenditure on education, improvement in business, economic security; and α, the βs and υi are as defined before.

With the composite empowerment, membership duration is statistically significant; the odds ratio is 3.37. This result suggests that 'old clients' are 3.37 times more empowered than 'new clients' on the overall empowerment. Average loan is also positively related and statistically significant suggesting, the importance of average loan received. On the other hand, age of the respondent is negatively related and significant. This suggests that empowerment reduces with increase in age of a client.

We used two methods Garikipati (2008) adopted to check the robustness of the results. First, we used the 'backward stepwise regression' to test SATDUR which starts with a full model (reported), and non-significant variables illuminated in an iterative process. We tested the fitted model when a variable is illuminated. The aim was to make sure that the model fits the data adequately. Once there are no more variables to be illuminated, the analysis is accomplished. We then used the likelihood ratio test to accept or reject the illuminated variables. The analysis indicated that the SATDUR coefficients were stable throughout the process, suggesting that our conclusion made on membership duration on the credit

program are robust. Second, we tested the significance of each of the indicators separately before we developed them. At the individual level, we found that the important variables maintained their signs and significance.

CONCLUDING REMARKS

The paper used a survey of SAT clients in Ghana as a case study. From this, in turn, we hoped to reflect on some of the most pertinent issues in the microfinance sector more broadly. The areas we assessed included clients' impacts. The originality and uniqueness of the study comes from the use of both qualitative and quantitative data analysis to examine the impact of the scheme on clients. With the qualitative data, we used descriptive statistics of survey responses to show the impact of income generation of the clients. With the quantitative analysis, we constructed empowerment indicators, which we used to assess how they affect the independent variables in the logistic model. We collected primary data from the field with the help from field assistance. The constructed indicators were used as independent and dependent variables to run logistic regression.

To analyzed the data, the study divided clients into two groups — new clients who have been with SAT for less than three years, and old clients who have been with SAT for over three years. We found that even though 'new clients' on average received larger loans, it was 'old clients' who received greater benefits. 'Old clients' on average had earned higher monthly incomes than the 'new clients'. The results of the regression suggest that membership duration in the program is an important determinant of assets ownership, the level of spending on a child's education, and improvements in clients' businesses. In all these areas, old members of the program were seen to be more likely to have received greater benefits. In this, these findings largely concur with most others in the literature in suggesting a role for MFIs in the alleviation of poverty.

We found that the provision of financial services by a SAT has improved the life of its beneficiaries in employment creation to generate regular income, spend on children's education and increase their asset ownership. This research provides adequate evidence in the various survey questions that we administered to suggest that 'long-time borrowers' became better off than those with less exposure to affordable credit.

There is enough evidence to show from the findings that the provision of financial services by the Sinapi Aba Trust has helped to improve the life of its customers in Ghana. The study has detailed how clients benefited from credit provided by the institution. The success chalked up here could be a good guide, not only for Ghana, but also for the providers of financial services to the poor everywhere.

One major shortfall of the study is that we collected data for a short period (due to limited time and resources), and the data may contain several distortions as a consequence. In addition, the data on income and expenditure was self-reported, so we could not verify the authenticity of these data. The best way out is the collection of time-series data or panel data which could be suggestions for future research.

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