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MICROFINANCE: AN EMPIRICAL INVESTIGATION IN MALI**

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DETERMINANTS OF BORROWER DROPOUT IN MICROFINANCE: AN EMPIRICAL INVESTIGATION IN MALI

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Abstract

Repeat borrowing is critical for the long-term financial viability of microfinance institutions (MFIs), which provide financial services to low-income households in developing countries. Repeat borrowers reduce MFI administrative costs, lower risks, and increase institutional productivity. In this paper we study the determinants of borrower dropout of an MFI operating in an urban center in Mali. Specifically, we quantify the explicit and implicit costs that a borrower must incur in obtaining loans from an MFI.

Introduction

In the microfinance industry, which offers financial services to low-income households in developing countries, maintaining repeat borrowers is critical for the long-run financial viability of microfinance institutions (MFIs)¹. Repeat borrowers reduce administrative costs, lower default risks, and increase institutional productivity. They require less administrative support than new borrowers, such as assistance with loan application, and repayment, and screening and monitoring costs are significantly reduced for repeat borrowers. The MFI, through sustained relationships, acquires valuable information on repeat borrowers, permitting it to make more informed, less risky lending decisions. Furthermore, repeat borrowers often demand larger loans, and thus generate more interest and fee revenue than first time borrowers.

Experts in the field of microfinance are becoming increasingly concerned with the low retention rates of clients in financial institutions. Low retention rates may indicate dissatisfaction with the products and services being offered and the high implicit and explicit costs in obtaining them, such as forming solidarity groups to become eligible, weekly meetings and blocked saving requirements. This dissatisfaction leads to clients “shopping around” for the best available services and occasionally becoming a member of multiple institutions. Clients engaging in multiple memberships incur high transaction costs just to have access to the financial services they demand, *e.g.*, larger loan sizes and

¹ A microfinance institution is a specialized financial institution that provides a broad range of banking services to poor people in developing countries who typically lack access to formal banks.

open access savings. Therefore, understanding the reasons that trigger client dropout is crucial for MFIs to maintain their financial viability in the marketplace.

In this study we examine the endogenous and exogenous factors that prompt clients to dropout of MFIs. The basic household/firm model developed by Singh, Squire, and Strauss is modified and extended to examine the economic behavior of microenterprises. This analytical approach is appropriate because it combines producer, consumer, and labor supply decisions, which are interdependent in the developing country context, in a theoretically consistent microeconomic model. In particular, the model is extended to incorporate both the implicit as well as the explicit costs of borrowing into the liquidity constraint of the microenterprise.

Through a unique survey design, 256 clients of a solidarity group-lending program in Bamako, Mali were interviewed. The empirical model is designed to specifically quantify the effect of client transaction costs on repeat borrowing. Repeat borrowing is affected by endogenous and exogenous factors. Endogenous factors include contract design factors and program requirements, such as frequent repayment schedules, forced and blocked savings, and weekly group meetings. Exogenous factors include sales variability, competition from other financial institutions, and household vulnerability to idiosyncratic shocks.

Previous studies have focused primarily on contract design issues modeled from the MFI's point of view. This study is unique in that we model borrower behavior in an attempt to understand why clients dropout of the institution. Understanding the behavior of borrowers is the first step in designing more flexible and cost-effective financial products for microentrepreneurs in developing countries.

The rest of the paper is divided into four sections. In section one a description of the Malian environment is provided for the reader's reference. In the next section, the research problem is examined in more detail. The research design and the estimation results are presented and discussed in sections three and four.

The Malian Context

Geographic and Economic Characteristics of Mali

Mali is a landlocked country with a surface area of 1,240,000 square kilometers. This makes it the second largest country in West Africa. The northern two-thirds of its landscape consist mainly of barren deserts and Sahelian scrublands, while the southern third is forested sub-tropical savanna. It is this southern third that is considered arable but, due to risky climatic conditions, annual rainfall is only adequate for 25 percent of the arable land. Mali's main water source is the Niger River, which traverses the country from West to East. The bulk of agricultural production occurs along the banks of this river, primarily in the southern third of the country.

Although Mali has a relatively small population of 10.1 million people, one can expect it to double in just 23 years, given its high population growth rate of 3.2 percent per annum. One reason why this population growth rate is so rapid is due to a high fertility rate of 6.8 children per woman, one of the highest in the world. This high population growth rate creates extreme pressure on an already fragile physical environment and an inadequate system of social services, basic infrastructure, and rudimentary labor markets. Other social indicators, such as those for education and health, are just as bleak. Only 35 percent of school-age children enrolled in primary education and less than 40 percent of the total population has access to basic health services (World Bank, 1998).

With a per capita GNP of US\$250 a year, Mali is considered one of the poorest countries in the world. Even though the country experienced significant economic expansion after the 1994 devaluation, as demonstrated by an average real GDP annual growth rate of 4.8 percent during 1994-97, coupled with a drastic reduction in inflation, from 24.8 percent to -0.4 percent during the same period. Yet, many macroeconomic indicators remain weak. For example, in 1998 the agricultural sector continued to account for 50 percent of the country's GDP, employing 80 percent of the population, thus reflecting a low productivity of labor in agriculture. Also, at the end of 1997, Mali's official external public debt was US\$2.93 billion, equivalent to 116 percent of GDP and 482 percent of 1997 exports of goods and non-factor services. Mali's narrow economic base is evident with 47 percent of exports concentrated in a single product of cotton. This coupled with

price fluctuations and changing demand conditions in world markets, creates uncertainty in the near future.²

Economy

The state of the overall economy has a significant impact on the growth of microenterprises. When institutions are either directly or indirectly helping businesses to expand, it is important to keep in mind that in good times the economic environment is supporting this effort whereas in bad times microenterprise will find it difficult to grow even with the best assistance (Liedholm and Mead, 1999). The macroeconomic outlook for microentrepreneurs in Mali and the institutions that assist them is positive. The economic growth continues to be steady over the last ten years with an average annual real growth rate of 4.3 percent and an average inflation rate of less than three percent (CIA Factbook, 2000). Both figures are estimated to remain steady or improve through 2001. Several multinational corporations increased gold mining operations in 1996-98, and the government anticipates that Mali will become a major Sub-Saharan gold exporter in the next few years.

Bamako is the capital city of Mali. The District of Bamako is split up into six administrative districts and covers an area of approximately 18,000 hectares.³ There are approximately 66 neighborhoods in the six districts. From 1987 to 1997, the capital city experienced rapid population growth, at an annual rate of 4.4 percent (Sissoko-Breukers,

² At the end of 1997, cotton, livestock, and gold accounted for 75 percent of total exports and non-factor services.

³ One hectare is equivalent to 2.471 acres.

1997). The last national census (1997) recorded a total population in Bamako of 1,016,167 inhabitants. This is expected to grow to 1.5 million people by 2002.

An unequal population density across districts characterizes Bamako. Districts I and IV continue to be the most densely populated and are estimated to reach 145 and 104 inhabitants per hectare, respectively, by 2002, whereas district VI, despite its strong growth rate of 9.4 percent, is only expected to grow to 39 inhabitants per hectare in 2002, up from 12 inhabitants in 1987. Districts I, V, and VI are the most vast of all districts and show the highest growth rates in population at 4.3, 5.1, and 9.4 percent, respectively, according to the preliminary findings of the 1997 national census (MEPI, April 1998). This uneven population density affects the economic opportunities of the microentrepreneurs in Bamako. More densely populated areas will have larger markets for entrepreneurs to buy and sell goods. In addition, larger markets will positively affect their business due to an increased access to inputs and transportation services. In the long run their transaction costs will be lower than entrepreneurs living and working in less dense areas.

Informal Business Sector

In Mali the informal sector employs 85 percent of the economically active population accounting for 20-25 percent of GDP (Webster, 1995). In rural areas most non-farm activities consist of agricultural transformation and petty trade whereas in urban areas entrepreneurs are engaging in trade and services. Most enterprises in the informal sector are home-based with the owner or a family client financing startup costs. Salaried

employees are an exception in this sector where owners themselves carry out the bulk of their business activities. Typically unpaid apprentices, usually family members, assist owners. In this sector, business owners largely earn only marginal profits due to fierce competition derived from easy market entry and exit.

The Malian informal sector faces several constraints, both non-financial and financial. The most pressing non-financial obstacles confronting entrepreneurs in Mali are: 1). A constraint on product demand due to overcrowded markets from easy entry; 2). Lack of product differentiation due to the limited pool of skilled labor; 3). The poor state of infrastructure to support the development of economic activities such as limited and poor roads making access to some areas difficult, high per unit utility costs, a poor communication infrastructure hampering information flows, as well as non-existent or limited storage facilities for perishable fruits and vegetables (Webster, 1995).

The principal financial constraint facing Malian entrepreneurs is the limited access to financial services due to barriers imposed by the formal banking sector as well as weaknesses in the provision of informal financial services. Terms and conditions of formal sector loans are too strict for this population, requiring entrepreneurs to guarantee assets they do not typically possess. In addition, banks do not lend to microentrepreneurs as they feel it is too costly to grant loans to this group. Instead, they prefer lending larger amounts to more established clients. At the other end of the spectrum, entrepreneurs use informal financial mechanisms to meet their credit and savings requirements. To date entrepreneurs are still experiencing ruptures in their business activities due to insufficient

working capital and the lack of reliable borrowing sources. Finally, of tantamount importance, microentrepreneurs in Mali do not have secure places to deposit their savings to facilitate liquidity management.

Financial Sector

Mali has been a client of the West African Monetary Union since June 1984 when it joined six other member states, namely Benin, Burkina Faso, Côte d'Ivoire, Niger, Sénégal, and Togo. This Union has a common central bank, the Central Bank of West African States (BCEAO), with its headquarters in Dakar, Senegal and national branches in each client state (Ouattara et al, 1997). In addition to the central bank, there are seven commercial banks and two financial institutions in Mali. Commercial banks are headquartered in Bamako with branch offices in some regional capitals. To date there are no commercial branch offices in the rural areas in Mali.

In the last ten years Mali has experienced an emergence of semi-formal microfinance institutions (MFIs) that offer a variety of products and services that are better adapted than formal banks to the needs of the informal sector entrepreneurs in both rural and urban areas. In 1997 it was estimated that the MFI sector already accounted for 5 percent of savings mobilized and credit granted by the formal financial sector. These institutions range from mutualist credit unions, to financial institutions based on the solidarity group model. In addition, there are several non-governmental institutions that have credit and savings activities. A World Bank study on this sector, completed at the end of 1996, identified 30 microfinance institutions that were providing financial services to the

informal sector in Mali. Out of the 30 institutions, 24 are divided as follows: three mutualist programs; four village bank programs; ten institutions based on the solidarity group principle; and seven organizations with a credit and savings component.

At the far end of the spectrum are informal financial mechanisms such as credit from family members and friends, ROSCAs, traditional moneylenders, money holders, and suppliers' credit⁴. In Mali, these vehicles are characterized by limited and irregular supply of financial services, high interest rates and fees, and lack of security. For example, entrepreneurs who use ROSCAs as their main savings mechanism are forced to wait their turn in the rotation and receive no interest on money saved.

Many of the above statements on informal finance hold true for the clients surveyed in this study. For example, 85 percent of the business startup loans came from family clients and friends. In addition, 73.3 percent of the sample has participated in a ROSCA in the last 12 months, but only 9.8 percent have used the savings services of money holders. In this sample, 52.6 percent had granted loans to their family and friends within the last 12 months. There was very little evidence of the use of traditional moneylenders, but several entrepreneurs that were interviewed received credit from their suppliers on a daily or a weekly basis.

⁴ ROSCAs are rotating savings and credit associations. It consists of members who agree to contribute a fixed amount of money on a regular basis to a fund that is distributed in turn to each member. A member's turn is either determined randomly or non-randomly by a unanimous agreement by all association members (Von Pischke, 1991).

Background of the Problem

Why Is It Important?

Understanding customer satisfaction and loyalty is important from both the firm and the consumer viewpoint. On the firm side dropouts are extremely costly, both in terms of lost investment already spent on the client and in terms of forgone future income that the client could have generated. For example, in a group lending program older members that dropout must be replaced with new members whose smaller loan balances do not generate as much interest income as older clients' larger loans do. As dropouts increase the sustainability of the institution decreases.

Understanding customer satisfaction on the client side is important so that MFIs can help individuals to maximize their utility. With this understanding banks will be able to offer more appropriate loan products that will in the long run maximize clients' utility by meeting their business needs, reducing their transaction costs, and insuring their vulnerability.

Who Else Has Worked on This Problem?

Although leaders of the MFI industry are becoming increasingly concerned with the implications of high client dropout rates, little rigorous research has been conducted to date to determine the causes of this problem. However, there have been several descriptive field studies carried out in many regions of the developing world. Reasons why clients dropout of MFIs at excessively high rates can be grouped into the following four categories: 1) institutional problems; 2) business problems and/or failure; 3) personal

(social) problems; and 4) miscellaneous problems. A brief review of their findings is provided for the reader's reference.

In several of the field studies it was found that people most frequently left MFIs due to their dissatisfaction with the financial products and services being offered. For example, an MFI in Bangladesh found that 27 percent of dropouts left due to negligence of staff and lack of staff quality and efficiency, 75 percent left due to low loan ceiling and absence of multiple loans, and another 23 percent cited a dissatisfaction with saving rules as one of the reasons for leaving (ASA, 1996). Mustafa et al. (1996) found that individuals dropped out of the BRAC program due to the lack of easy access to savings, the excessive emphasis on credit discipline, the frequent policy changes, and conflict among client-members.

In several of the studies it was also found that poor business performance was a leading cause of client dropout. In particular, clients left due to inconsistent sales and business stoppages, and/or total business failure (Painter and McKnelly, 1998, Simanowitz, 2000, CGAP 1999). In some cases sales variability precluded several clients from being able to finance their weekly loan repayment, prompting them to default on their loans. In essence these delinquent clients *involuntarily* dropped out of the MFI.

Another major reason for client exit was due to personal problems. These include migration, sickness, or death as well as family disapproval and lack of time for weekly

meetings often required by the institution (Hassan and Shahid 1995, Mustafa et al 1996, Painter and McKnelly 1998). In addition, clients left due to problems within their lending group, such as peer pressure over loan repayments, lack of compliance with group rules, and large loan differentials too high for poorer members of group to guarantee (Hassan and Shahid 1995, CGAP 1999).

Lastly, the remaining reasons why people drop out of MFIs are due to a downturn in the national economy or adverse climatic conditions as well as competition from other institutions or proximity of the institution (Churchill and Halpern, 2000, CGAP 1999).

Research Design

Study Sample

A random sample of 260 heterogeneous clients of a solidarity group-lending program⁵ in Bamako, Mali was drawn to examine the factors that induce client dropout. This sample was stratified based on the activity level of the client. Namely, clients that had loan activity within the four months prior to the study were deemed *active*, while those that didn't were termed *inactive*.

⁵ The MFI was created in 1996 to provide a wide range of savings and credit services specifically adapted to the needs of the micro-entrepreneurs in Bamako, Mali. The provision of these financial services is an attempt to respond to basic economic needs and the expressed demands of the local entrepreneurs. Its main institutional strategy is to establish a decentralized, minimalist credit delivery program based on the "Grameen Bank" approach of group savings mobilization and loan provision. In the same fashion the Grameen model, this institution's solidarity group strategy is based on peer pressure to enforce loan repayment. In the event of non-payment by a member, the rest of the group is responsible to repay in full the delinquent member's portion of the loan before receiving a subsequent group loan.

Study Hypotheses

The following key hypotheses are tested in this study:

1- *Contract design and program characteristics affect dropouts.* Loan size is either too small for the needs of the business or too large for the business to generate enough income for repayment. Repayment schedules are inappropriate for the nature of the business, e.g., weekly repayment for seasonal activities, such as gardening or other activities linked to agricultural markets. Program requirements, such as weekly meetings and forced and blocked savings lead to dropout due to high transaction and opportunity costs associated them.

2- *Group dynamic issues such as group size and the degree of member homogeneity affect dropout.* As group size increases, coordination problems increase which leads to dissatisfaction and dropouts amongst members. More heterogeneous groups may lead to large loan differentials within the group, which could lead to dropout. In this case, borrowers with the smaller loan size will drop out because they do not want to take on the risk of insuring someone else that has a much larger loan size. In effect, it becomes too risky for the smaller borrower.

3- *Vulnerability of the household/firm to systemic and idiosyncratic shocks affects dropouts.* Different wealth levels of household/firms deal differently with shocks. Poorer household/firms are more vulnerable to shocks and have smaller pool of resources to use in the event of such shocks (less insurance) whereas wealthier household/firms have a larger pool of resources to draw upon in the event of shocks.

Model

The model is based on the standard utility maximization model in which a representative agent is assumed to have preferences over two choices, in this case taking a loan or not. It is assumed that the action choosing take a loan, $Y=1$, provides more utility than not choosing to take a loan, $Y=0$. In other words, $U(Y=1) > U(Y=0)$ for individual i . In essence, we are trying to determine the probability that $Y=1$, which is assumed to depend on K observable and independent variables, X_k . This dependent relationship is written as follows: $P(Y=1|X_1, \dots, X_k)$. Since this relationship is non-linear, a logistic function is used to estimate the association between binary, endogenous variable, Y , and the independent, exogenous variables, X_s .

In this study, we estimate the relationship between staying in a lending program and the factors that influence that decision. We test the above stated hypotheses with the following econometric model.

$$\begin{aligned} \text{LACTIVITY}_i = & \beta_1 \text{AGE}_i + \beta_2 \text{EDUC}_i + \beta_3 \text{LDIFF}_i + \beta_4 \text{GSIZE}_i + \beta_5 \text{NBLOANS}_i + \\ & \beta_6 \text{GMEETING}_i + \beta_7 \text{FAMREV}_i + \beta_8 \text{DGINDEX}_i + \beta_9 \text{LFREQ}_i + \beta_{10} \text{LPAYMNT}_i + \\ & \beta_{11} \text{LLENGTH}_i + \beta_{12} \text{LFEES}_i + \beta_{13} \text{SAVREQ}_i \end{aligned}$$

Where,

LACTIVITY = 1 if loan activity within last 4 months;
 0 otherwise.

AGE = age of the client;

EDUC = number of formal education years;

LDIFF = loan differential within lending group;

GFSIZE = number of members in lending group;

NBLOANS = number of loans obtained to date;

GMEETING = dummy variable for participation in group meetings;

FAMREV = number of family wage earners;

DGINDEX= household's durable goods index;

LFREQ= dummy for repayment frequency, where

LPAYMNT= dummy for repayment amount;

LLENGTH=dummy for loan length;

LFEES= dummy for interest rate and fees;

SAVREQ= dummy for savings requirement.

Where the dummy for LFREQ, LPAYMENT, LLENGTH, LFEES, AND SAVEREQ is:

1 = extremely important reason for dropout;

0 = not all an important reason for dropout.

Estimation Results

Given the non-linearity of the probabilistic association between remaining in a lending relationship and the factors that influence that choice the classical linear regression model, ordinary least squares, is not appropriate for its estimation. Instead, we use a non-

linear probability model, logit, to estimate the model described above. The following results were obtained:

Table 1 : Logistic Regression Results of Borrowing Behavior in Mali

Variable	Coefficient (Marginal effects on Prob[Y = 1])	Standard Error	z ratio (b/St.Er)	P[Z >z]	Mean of X
AGE	.4593010075E-02	.27665721E-02	1.660*	.0969	40.031250
EDUC	.2508768125E-02	.85759094E-02	.293	.7699	4.0703125
LOANDIFF	-.2809799559E-06	.31754352E-06	-.885	.3762	55978.129
GSIZE	-.2666897458E-01	.13592049E-01	-1.962**	.0498	6.1640625
NBLOANS	.7603758127E-01	.28357458E-01	2.681***	.0073	2.3281250
GMEETING	.8028664869E-01	.72243584E-01	1.111	.2664	.55859375
FAMREV	-.6368438225E-01	.75245524E-01	-.846	.3974	.56250000
DGINDEX	-.5747232793E-02	.27828667E-01	-.207	.8364	1.6656250
LFREQ	-.4588424232	.13922362	-3.296***	.0010	.36718750
LPAYMNT	-.2802298268	.12702900	-2.206**	.0274	.32031250
LLENGTH	-.2381676114	.16689750	-1.427	.1536	.31640625
LNFEES	-.1736046011	.10380445	-1.672*	.0944	.30859375
SAVEREQ	.3287126609	.25456853	1.291	.1966	.27343750E-01

Source: OSU Survey Data, Mali 2001.

*, **, *** significant at the 0.10, 0.05, 0.01 levels, respectively.

In our analysis we found that *contract design* and *program characteristics* do lead to client dropout. Three out of five of the parameter estimates on the dependent variables representing contract design and program characteristics were significant, namely LFREQ, LPAYMNT, and LNFEES. In these cases, client dropout can be attributed to the inappropriateness of the frequency and amount of repayment as well as the interest rate and late fees associated with these loans. Due to the high frequency and amount of repayment installments clients were unable to keep to the preconceived schedule for

repayment. The inability to keep up with predetermined repayment schedules propelled some clients into delinquency, and further into debt due to late fees assessed to them.

Secondly, we found that some group dynamic issues do affect client dropout. In particular, group size is inversely related to client activity. In other words, as the group gets larger, clients begin to dropout. This makes sense due to the inherent coordination problems associated with the management of larger groups. As problems arise group members become dissatisfied and dropout. The parameter estimate for group size was significant at the 0.05 level. The second variable, LOANDIFF is a variable that represents the difference from the maximum and minimum loan amounts received within the group. LOANDIFF is used to measure the degree of group heterogeneity was not significant.. This may be in fact true, but the measure used to compute this variable was a crude estimation of the true level of loan differentials that may exist among group members. The non-significance of this parameter estimate may indicate a very low level of loan differentials across all groups.

Lastly, household wealth does not seem to affect client dropout. Both parameter estimates of the two variables used to measure household wealth (DGINDEX) and resources (FAMREV) were not significant, even though the direction of influence seems to make intuitive sense. As wealth and resources increase people tend to dropout of these types of institutions that serve primarily the lending requirements, and not the savings needs of the entrepreneur.

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