

The Unfulfilled Promise of Microfinance In Kenya:

The KDA Experience

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INTRODUCTION

Microfinance offers promise for alleviating poverty by providing financial services to people traditionally excluded from financial markets. Small-scale loans can relieve capital constraints that might otherwise preclude cash-strapped entrepreneurs from investing in profitable businesses, while savings services can create opportunities to accumulate wealth in safe repositories and to manage risk through asset diversification. While this promise of microfinance is widely touted, it is infrequently subject to careful evaluation using detailed data.

This chapter examines the extension of microfinance services to people in Kenya. Using data collected from seventeen Financial Service Associations (FSAs) founded by the Kenya Rural Enterprise Program (K-REP) Development Agency (KDA), we explore the intricacies of microfinance institutions emerging in these challenging environment.

Similar to cooperatives, FSAs mobilize local resources, capitalize upon local information and wealth, and tie it back into the local economic system by investing in borrowers who are members of the FSA community. Human resources too are local, as staff and board members are recruited from the village and trained by KDA in FSA administration, accounting, and portfolio management. FSAs introduce scale-appropriate investment instruments in equity as well as in savings. By presenting accessible opportunities to hold assets in a different and hypothetically safer form, FSAs can, in principle, provide a safe repository for savings as well as start-up capital to potential entrepreneurs, who otherwise might be prevented from engaging in business due to binding liquidity constraints. If they can indeed foster asset diversification and the creation of business opportunities, FSAs have a potentially pivotal role to play in regions struggling to achieve economic growth. But given the experience we document below, achieving this promise seems to require some changes in design and practice.

Nonetheless, FSAs face formidable challenges in Kenya, including poor infrastructure, formal banking systems inaccessible to the poor, lack of savings alternatives, and pockets of politically and economically marginalized populations. Moreover, the promise of decentralized decision-making to obviate information problems, to mobilize local wealth, and to encourage community-based investment can fall prey to power relations that pervade poor communities. The promise of microfinance, including the FSA model, is undeniable; the reality of its experience nonetheless demands careful scrutiny.

This chapter investigates whether or not the provision of KDA's microfinance services in Kenya realizes this potential to help participants mitigate risk, foster profitable investment, and improve welfare. Ultimately, we find that despite their stated pro-poor mission, KDA FSAs are typically bypassing the poorest members of the communities they serve and implicitly fostering regressive wealth distribution from lower-income, non-borrowing members to higher-income members more likely to take out and default on large loans. An important lesson to learn is that without careful analysis of the patterns of benefits reaped and the bearers of costs borne, we cannot accept at face value that an initiative is "pro-poor". The KDA experience appears one of unfulfilled promise.

MICROFINANCE IN BRIEF

Microfinance refers to small scale financial services such as cash loans, money transfers, direct deposits, savings, and insurance made accessible primarily to the poor. Two prominent features of successful microfinance institution building are group lending and savings (Yaron, 1994).

Popularized by the Grameen Bank in Bangladesh, group lending refers to the practice of issuing loans to individual members of small, homogeneous groups. Participants self-select into

groups which collectively guarantee loans issued to their members. All members are barred from further access to credit in the case of default by one group member, providing strong incentives for the group to ensure repayment by each individual borrower.

Stiglitz' (1990) seminal work on peer selection and monitoring argues that joint liability reduces informational asymmetries between borrower and lender. Without indicators signaling creditworthiness, such as established credit histories and regular wage salaries, outside lenders protect against the threat of default by charging a high rate of interest or requiring significant collateral, irrespective of credit risk heterogeneity among borrowers. The lender's inability to observe the borrower's risk type yields the standard example of adverse selection.

In contrast with external formal sector lenders, a community shares a great deal of knowledge about its members. Joint liability harnesses this familiarity to circumvent the problem of asymmetric information. Participants affiliate with others of similar risk-profiles because the group is liable for the loan repayments of all members. The threat of sharing liability on a defaulting member's loan moderates the problem of adverse selection as groups rationally exclude potential members with high levels of ex ante risk. Using community knowledge, interdependent groups reduce the lender's ex ante risk exposure in two ways: by excluding high risk types from joining into their group and by approving only those loans whose risk they are willing to share within the group. Contractual interdependence through group lending not only reduces ex-ante risk, but also moderates ex post risk. Intensive peer monitoring of the borrower after loan disbursement diminishes moral hazard, or diversion of the loan toward investments riskier than its agreed upon purpose. Borrowers repay in a timely and efficient manner to safeguard the group's continued access to future loans. By reducing the risks of asymmetric information and moral hazard, groups enable the lender to afford lower interest rates

and reduce, or eradicate, collateral requirements. As the poor lack vehicles for wealth creation, the ability of group lenders to circumvent stringent collateral requirements via joint liability is a key feature rendering microfinance accessible to the poor.

Group lending reduces informational asymmetries and increases borrowers' willingness to repay through informal sanctions. Besley and Coate (1995) show that group-levied social sanctions, including peer pressure, loss of social prestige, and social isolation, can improve rates of loan repayment. Joint liability transfers certain fixed costs of small-scale lending, including screening, contract, monitoring, and enforcement, from the bank to the group, rendering financially viable the administration of small loans in rural areas to people traditionally regarded as high-risk. Though joint liability imposes some non-trivial costs upon participants, including frequent group meetings and limited access to individual credit, members of groups continue to seek loans. Empirical evidence generally supports the superiority of group lending repayment rates over repayment rates of loans issued to individuals (Adams and von Pischke, 1992; Yaron, 1994; Conning, 1999; and Woolcock, 1999).

Savings, too, emerges as a critical component of MFI success by serving as collateral on loans and "introduc(ing) and enhanc(ing) financial discipline among inexperienced, first-time, small-scale borrowers" (Yaron, 1994, p.52). Microcredit is explicitly costly, with effective annual interest rates of up to 130%, while savings is relatively cheap, leading Yaron and others to speculate that savings facilities can serve a greater number of clients than lending services. They further claim success in mobilizing savings as the optimal, and in some cases unique, path toward MFI financial self-sustainability. Well-established empirical evidence supports this perspective (Hulme and Mosley, 1996; Hollis and Sweetman, 1998; Christen, 1998; and Morduch, 2000).

OVERVIEW OF KDA

Founded in 1984 by World Education, Inc., the Kenya Rural Enterprise Program (K-REP) was designed to provide credit and technical assistance to financial services NGOs (Pederson and Kiiru, 1997). Pederson and Kiiru report that in 1989, K-REP's Board of Directors expanded services to include a minimalist lending program through existing rotating savings and credit associations (ROSCAs) and newly formed joint liability groups. From 1991 to 1995, the two programs enjoyed a collective repayment rate of 94%. Inspired by this high rate of repayment and the 1996 concept paper by Dr A. Jazayeri, K-REP introduced the Financial Services Association (FSA). After four years of rapid expansion, K-REP underwent restructuring in 2001, resulting in three sister organizations, K-REP Bank, K-REP Consulting, and K-REP Development Agency (KDA), the last of which is devoted exclusively to the management of the FSAs. As of December 2000, KDA's 52 FSAs had attracted a total of 20,356 members who had received over 6,680 loans, valued at 33,259,000KSh.¹ By 2001, KDA had reached the upper bounds of its organizational capacity, and began eschewing donors' offers for new FSA funding in order to refocus attention from FSA expansion to FSA strengthening.

To address the severely limited financial services available in areas traditionally ignored by commercial banks, Jazayeri (1996) modeled the FSA as a self-reliant, small-scale financial institution catering to a community's niche needs by harnessing local equity capital, thereby releasing the institution from dependence upon the goodwill of external funding agencies. A survey of ten prominent MFIs in Africa and Asia by Zeller et al. (1997) concludes that limiting the role of donors to funding start-up costs increases the chances of MFI financial viability.

¹ The average exchange rate in 2000 was approximately 76 Kenyan shillings per U.S. dollar.

KDA limits its FSA commitment to providing start-up capital for non-productive assets; the initial provision of operational materials; training in bookkeeping, marketing, and management for the FSA officials, staff, and members; and a yearly audit service to check the books, calculate share value, and provide technical assistance. KDA grants these goods and services to the FSA, and in addition hires and trains a Field Coordinator (FC), a professional with an accounting background, native to the region. FCs are assigned several FSAs in the region and assist in raising share capital, while helping the fledgling FSA with addressing technical issues.

In the FSA model, the institution is owned and managed by the community, and targets the poorest twenty percent of the population (Pederson and Kiiru, 1997). Locals buy FSA shares at 300KSh per share. Share ownership confers access to loans and savings services. The value of the shares sold generates a loan fund, redistributable amongst members via credit, and KDA does not augment share capital. Each member has one vote in the annual election of the FSA Board of Directors, comprised of eight members with staggered three year terms. The Board of Directors hires staff members and applies local knowledge about FSA members and their creditworthiness to screen loan applications. Meeting once a month, the Board evaluates new loan requests and reviews current loan repayment status. The responsibility for the collection of bad debt lies primarily with the Board of Directors. Monetary remuneration of the Board is infrequent, but not prohibited by the by-laws of the FSA. Incentive to screen out bad loan risks and to recover delinquent loans arises from the Board's vested interest as investors in the FSA and the social (and legal) responsibility conferred by election, as opposed to salaries or wages.

FSA bylaws allow members to apply for loans up to four times the value of their shareholdings, thus rewarding investment in the bank, while at the same time limiting idiosyncratic risk exposure. Loan applications require personal information as well as loan use

details, making explicit the consequences of loan default, which includes the imposition of stiff penalties, the seizure and subsequent sale of collateral, as well as pressure applied to loan guarantors. In addition, members are encouraged to deposit savings in the FSA, up to ten times the value of their shareholdings. In contrast to the sale of shares, monies deposited as savings cannot be invested, thus the FSA faces a one hundred percent reserve requirement on deposits. Because of this restriction on the employment of deposits, savings earn no interest payments.

Protection of equity investment encourages FSA members to monitor borrowers and ensure prompt repayment. Share values increase as FSAs earn profits from interest payments and penalties collected, and fall when loans default. All shareholders share an equity incentive to stay informed about the status of FSA loans. Facilitating the exchange of information between FSA staff, the Board of Directors, and shareholders, Annual General Meetings (AGMs) make explicit the current share value and publicize borrowers in poor standing, generating the threat of social sanctions imposed on defaulters by the shareholding community. The ideal of stringent application screening combined with intensive peer monitoring encouraged Jazayeri to predict the average FSA to attain total administrative and financial sustainability in two years.

DATA AND METHODS

The objective of this section is to explain the methods used in data collection and analysis to address the following questions:

1. Is KDA reaching its target population? Who purchases shares and joins the FSA?
2. To what extent do members utilize FSA services? Which members reap rewards from FSA services?

3. Do FSAs achieve financial sustainability and the development objectives of KDA and its donors?

To answer these questions, we visited 14 of KDA's 52 FSAs over the course of eight months from January to August 2000. Five of these were located in the Kwale District of Coast Province (Lunga Lunga, Tiwi, Msambweni, Mwaluphamba, and Kikoneni), four in Migori District in Nyanza Province (Rongo, Mbita, Magunga, and Karungu), and five in the Marsabit District in Eastern Province (North Horr, Gabra Scheme, Kalacha, Korr, and Badha Hurri). The provinces were selected by stratified purposeful sampling, maximizing geographic diversity and selecting economic systems and population density as the subgroups of interest. Located in the far southeast of the Country, Kwale District is primarily an agricultural zone with a mid-range population density of 57 people per square kilometer (CBS, 2001). The Migori District, sitting in the far southwest corner adjacent to Lake Victoria, boasts the highest population density in the country with 120 people per square kilometer with an economy based upon a mixture of fishing and cash crop production (CBS, 2001). Marsabit District, in the northern section of the country, features arid lands, a pastoralist economy, and the lowest population density in Kenya at 2 people per square kilometer (CBS, 2001).

Site specific enumerators collected data from FSA staff, officials, members, and FSA non-members. Information on demographics, wealth, income, savings and loans access and use, and FSA participation were solicited. Each enumerator attempted to interview the entire Board of Directors, 25 FSA members and 25 non-members. The sampling frame was established by stratifying each site's population into clusters of members and non-members. The member interviewees were selected at fixed intervals with a random starting point from the complete roster of adult shareholders. Upon completion of a member survey, enumerators scoured the

immediate vicinity of the interview for a non member of the same age and gender as the member respondent to participate. In this quasi-experiment, non-members were not randomly sampled but rather informally matched with randomly sampled FSA members.

In the Eastern Province, the members herding animals far from town were excluded from the sampling frame. Only town dwellers and members located not further than 10 kilometers from town were included in the sampling frame. Truly nomadic pastoralist members were excluded, due to lack of transportation and roads and lack of accurate information about the whereabouts of pastoralists in search of forage and water. This selection may cause a problem of bias in the data as the sample of northern members surveyed is not entirely random. However, few members were excluded due to inaccessibility, with the exception of Kalacha FSA, where one third of the originally sampled were summarily excluded due to inaccessibility. In total, 17 staff, 108 Board, 282 member and 292 non-member surveys were collected from 14 sites.

FSA PERFORMANCE

We begin with a cross sectional analysis of data derived from monthly monitoring reports submitted to KDA headquarters by the FSAs. The cross-sectional reports date to November and December of 2000, and include one observation from 51 of KDA's 58 FSAs (as of August 2004), located in 16 districts across Kenya. It should be noted that the data represent claims made by the FSAs, and were not verified. While data collected from the field often contradicted the monthly monitoring report information, these are the only data available to work with and are therefore used as second best indicators.

The data as reported to KDA and updated by field observation were used to estimate the effect of FSA characteristics upon share value using the following regression model.

$$\text{Sharevalue} = f(\text{Headcount, North, LGen, Members, Members}^2, \text{Loans, Loans}^2, \text{Savers, Savers}^2),$$

where Sharevalue is a continuous variable representing the share value in KSh as calculated between the period of November 2000 and March 2001. Though in principle this variable is bounded from below by zero, none of the FSAs exhibited complete erosion of share value, so we use a simple ordinary least squares estimator. Recall that members across all FSAs purchase shares at 300KSh and that money is pooled together to form share capital which is redistributed among borrowing members in the form of loans. Share value reflects the health of the loan portfolio. Repaying loans replenishes share capital, collection of loan interest and fees augments share capital, and losses due to loan default reduce share capital. Share capital on hand at the FSA plus the expected return from loans not in default is divided among the number of shares issued to calculate share value.

How is FSA share value affected by poverty in the region? Headcount captures the share of the total population whose consumption falls below the poverty line, defined as the consumption of 1,239KSh per adult equivalent in rural locations per month, and 2,648KSh in urban locations (GoK, 2000). This variable is drawn from the Kenyan Ministry of Planning and National Development's Central Bureau of Statistics compilation of poverty measures (CBS, 2003). District averages are used for FSAs in locations not reporting poverty statistics. Of the 38 FSAs for which poverty statistics are available, 61 percent are located in poorer locations relative to the District average. The expected impact of poverty in the FSA area is unclear. On the one hand, increased poverty might decrease the profitability of FSAs as business opportunities in poorer areas tend to be less lucrative. On the other hand, greater poverty may

mean fewer alternative sources of financial services, reducing competition and making the FSA more profitable, and thereby enhancing share value..

The binary variable North takes on value 1 if the FSA is one of seven located in the Eastern or Northeastern Districts, and 0 otherwise. The variable North represents FSAs serving pastoralists in transition. Lack of business opportunities, coupled with high risks and poor infrastructure in this region lead to a negative expected coefficient estimate associated with share value.

LGen is a count variable quantifying the distinct rounds of lending which occurred between the opening of the FSA and December 2000. For FSAs which had yet to offer loans, this variable equals zero. Due to capital constraints, the next round of loans cannot be disbursed until the majority of the previous wave has been repaid. Though loans are approved in the interim between disbursement and repayment, new loans cannot be issued until share capital returns to the FSA. Rather than a semi-continuous process, loans tend to be issued at six month intervals. In the case where loans are repaid in a timely manner with interest, additional loan generations build equity and should have a positive effect upon share value. If, however, credit repayments are low, share values should then erode over time and the coefficient estimate on the LGen variable will be negative. Overall, 67% (34 of 51) of FSAs reported share values higher than the purchase price of 300KSh, and 25% (13 of 51) reported share value loss. Note that without disbursing loans (LGen equals zero), share value can be no higher or lower than 300KSh.

Members, the number of FSA shareholders, and Members², the number of members squared, capture the prospective nonlinear relationship between membership and FSA profits. Though expansion of the FSA by member recruitment increases the loan fund, it may

simultaneously tax the FSA community's ability to self-regulate through screening and peer monitoring. If the benefits of additional loan capital outweigh the added costs of monitoring new members, membership should increase expected share value. If, on the other hand, the costs of expansion outweigh the benefits of additional loan capital injected by the sale of shares to new members, then the estimated effect on Sharevalue could be negative. Field observations suggest that FSA boards and staff do not always rigorously evaluate loan applications and that members are not particularly aware of their peers' loan status. Therefore, we hypothesize that expansion of the FSA community might be beneficial, up to a point, in expanding the pool of loanable funds, but that expanded membership gradually diminishes the FSA's capacity to carefully manage the loan fund. This would imply positive and negative estimated coefficients for the Members and Members² variables, respectively.

Loans and Loans² represent the number of loans disbursed and that quantity squared, respectively. The logic of this quadratic specification is quite similar to that for membership. A high count of loans disbursed, controlling for Loan Generation, likely signals great demand for credit due to profitable local business opportunities. This should be associated with increased share values, as reflected in positive estimated regression coefficients on at least the first of these variables.

As mentioned previously, a strong emphasis upon savings typifies many successful microfinance programs. In KDA's model however, FSAs are prohibited from productively employing savings except as deposits in commercial banks, a linkage which none of the sampled FSAs had yet established. From the FSA's perspective, savings represents a liability as they must be administered and safeguarded at the opportunity cost of additional share capital which could theoretically earn a positive rate of return through efficient loan repayment. Though

regulations render savings deposits a deadweight liability, savings can nonetheless serve as loan insurance or collateral, to be confiscated in the event of loan default, or less drastically, to draw upon for loan repayment. In addition, some FSAs have implemented savings withdrawal fees, to pay for the fixed costs of transactions. Savers tallies the number of members who have ever saved at the FSA, Savers² is the number of savers squared. If the role of savings in the FSA is indeed a key determinant success as predicted in the literature, and profits increase in savers at an increasing rate, then the regression should yield positive coefficient estimates for these savings variables.

Table 1: OLS estimates of determinants of FSA share value

Variables	Coefficient Estimate ²	Robust Standard Error ³
Headcount	1.481**	0.668
North	-99.834**	41.908
LGen	-12.745*	6.481
Members	0.174**	0.057
Members ²	-0.001***	0.000
Loans	0.920**	0.401
Loans ²	-0.001	0.001
Savers	-0.193	0.181
Savers ²	-0.001	0.000
Constant	203.425***	52.732

n = 51 r² = 0.718

² Throughout the chapter, *** signifies estimates that are statistically different from zero at the 1% level, ** at the 5% level, and * at the 10% level

³ Since FSAs in the same regions tend to share characteristics, robust standard errors are used to take into account heteroskedasticity and inter-region correlation (White 1980).

Contrary to our expectation, the incidence of poverty is positively associated with FSA share value. This result suggests that poorer people are more likely to repay FSA loans, an idea which we develop further below. With fewer financial alternatives available, people from more impoverished regions might have greater incentive to repay loans, so as to remain in good standing with the FSA. Pearce and Helms (2001) note that FSA interest rates are uncompetitive compared with other savings and credit cooperatives and ROSCAs, suggesting that FSAs might struggle in more competitive financial services markets. Among the fourteen FSAs sampled, the bivariate correlation coefficient between the poverty headcount index and the number of non-FSA financial alternatives accessed within the last year by respondents averaged across FSA site was -0.27. If this correlation holds across districts and the number of financial services used by respondents does decrease as the poverty incidence increases, then the positive coefficient estimate associated with the Headcount variable might substantiate Pierce and Helms' claim.

The coefficient estimate associated with the North dummy variable is negative and significant, suggesting that Northern FSAs are roughly half as profitable ($(203.425 - 99.834)/203.425$) as their down-country counterparts, all else equal. Poor spatial market integration, lack of infrastructure, high levels of covariate risk (e.g. due to drought), a relatively underdeveloped cash economy, and a dearth of non-livestock investment opportunities all likely contribute to this poorer average performance. Controlling for the headcount measure of poverty, the North variable reflects a fixed effect for the relatively isolated region with modest diversification of commercially viable opportunities.

This is reflected most clearly, perhaps, in transport costs and their implications for the cap on loan size, four times shareholdings. The dismal state of the roads in Marsabit District (Eastern Province), coupled with the lack of reliable transportation there, results in a long,

arduous, expensive journey into the District capital from settlements elsewhere in the District. In most other locations, the smallest loan size accessible to members holding one share (1,200KSh) is sufficient to purchase sundries (e.g., soap, spices, tea) for petty trade and to cover the fixed transactions costs of traveling to town to buy those supplies. In four of the five Northern FSAs, however, loans of 1,200KSh are insufficient to cover even the round-trip transport costs to Marsabit town, the nearest source for traders' provisions, leaving nothing for the acquisition of inventory. The negative estimated coefficient on the North variable may thus reflect regional differences in minimum efficient scale of lending given regional variation in the costs of commerce.

The greater the number of times the loan fund is turned over, the lower the return on investment, as indicated by the LGen's significant, negative coefficient. Given that the costs of operation do not vary greatly over the lifetime of the FSA, this loss reflects principal default rates not adequately covered by income from interest and penalty payments, sale of passbooks to new members, and services fees on loan applications and savings withdrawals. Since FSA income not related to loan servicing represents only four to 17 percent of FSA cash flow among sampled FSAs in operation for one year or more, repayment rates must necessarily be high in order to ensure preservation of share value in FSAs under present interest rates and fee schedules.

The negative estimated coefficient on LGen does not bode well for the future of FSAs. Controlling for other location and FSA characteristics,, if share value erodes at a constant rate of 12.75KSh per loan generation, a share purchased during FSA inception loses all value in approximately fifteen rounds of loans, or roughly twelve and a half years. This is plainly unsustainable.

The coefficient estimates for Members and Members² are both significant, positive in the linear term and negative in the quadratic term, suggesting that returns to membership increase, but at a diminishing rate up to some optimal membership level, which we estimate as 760 members. The estimated optimal membership size is significantly larger than the average memberships of all FSA districts, with the exception of Bomet/Buret, home to four FSAs with memberships larger than 760 (Table 2). It thus appears that most FSAs have not yet grown to optimal size. Of course, if share value is eroding, as reflected in the negative coefficient estimate on LGen, it becomes difficult to attract new members, as FSA membership appears a money-losing proposition. Reaching optimal scale thus likely depends on improvement in lending design and performance to stem share value degradation.

Table 2: Average Membership and Loans Issued by District

DISTRICT	Average Membership Across FSAs in District			Average Number of Loans Issued
	Mean	Min	Max	
Bomet/Buret	1170	428	1979	255
Busia/Teso	271	152	346	42
Garissa	420	404	436	138
Kilifi	274	170	415	87
Kwale	317	287	400	74
Machakos/Kitui	253	158	402	223
Makueni	232	195	285	12
Marsabit	188	109	398	95
Meru South	567	567	567	85
Suba/Migori	353	279	433	95
Taita/Taveta	336	56	616	301

The coefficients associated with LOANS and LOANS² yield a similar picture, although the negative point estimate associated with the quadratic term is not statistically significantly different from zero at conventional levels. Share value increases at a decreasing rate in the number of loans issued, holding membership and loan generation (LGen) constant with an optimum at 569 loans (relative to optimum membership size of 760 persons), significantly larger than the average number of loans issued across FSAs in any District (Table 2). Moreover, since the second order term's coefficient estimate is not significantly different from zero, this result suggests that the most profitable FSAs maximize lending volume each generation, signaling that the effectiveness of screening and monitoring does not seem to decrease with scale of lending once one controls for generation and membership size.

Contrary to the claims one finds throughout the literature, savings does not lead to increased FSA profitability. This result could be due to the stringent reserve requirement demanded of the FSA, not observed in other microfinance models where institutions are allowed to lend out a percentage of savings. Though some FSAs may benefit from savings through the collection of withdrawal fees, most deem savings a burdensome transfer of liability from members to the institution. It would seem that KDA would be well-advised to re-examine the role of savings in the FSA.

Both the percentage of members who save as well as savings expressed as a percentage of share capital vary greatly across Districts (Table 3). Marsabit and Meru South demonstrate particularly low rates of net savings to share capital, while Machakos/Kitui, Makueni, and Busia/Teso have particularly high rates of net savings. When we consider the number of savers, we find that the two districts in the North, Marsabit and Garissa, exhibit the lowest proportion of

savers among their shareholders, suggesting that if there is a latent demand for savings among pastoralists, it is not observed by northern FSAs.

Table 3: Savers and Savings By District

DISTRICTS	Savers as % of Members	Savings as a % of Share Capital
Taita/Taveta	80%	54%
Marsabit	9%	5%
Machakos/Kitui	69%	163%
Suba/Migori	96%	68%
Bomet/Buret	29%	53%
Kilifi	52%	32%
Kwale	53%	47%
Meru South	54%	6%
Busia/Bungoma/Teso	56%	180%
Garissa	26%	33%
Makueni	57%	148%
Average Across All Districts	53%	72%

INDIVIDUAL FSA MEMBERSHIP AND PRODUCT USE DECISIONS

Our results to this point indicate that FSAs are not fully living up to their promise. Share values erode as the institutions mature, reflecting earnings insufficient to cover loan defaults.

We've established, however, that FSA performance varies markedly across locations.

Profitability varies with FSA characteristics such as membership size and loan volume, as well as geographic factors, including the extent of competition from other financial service providers,

as proxied by the local headcount poverty rate, the quality of infrastructure, and the local importance of covariate risk (captured by the North dummy variable).

The characteristics investigated describe the share values of all members of FSAs. Since microfinance is a vehicle for assisting the poor, it is desirable to consider at a more disaggregated level who joins FSAs, especially in light of steadily eroding share values which suggest that members, on average, lose wealth by joining. Further, conditional on having selected into an FSA, who purchases multiple shares (securing access to larger loans up to four times their shareholdings), who borrows from the FSA, and who repays their loans? These patterns of individual behavior determine the distributional effects of the FSA within Kenyan communities. The individual household survey data we collected offers an uncommon opportunity to address these key questions.

FSA MEMBERSHIP

Do FSAs serve the poorest residents in Kenya? Relatively few people with access to an FSA actually become members. Using 1999 Census data, membership in December 2000 ranges from less than one percent of the adult population in the Suba/Migori Districts to just over 14% in Bomet/Buret Districts. Membership rates are highest in towns such as Korr and North Horr (11% and 17%, respectively), as opposed to rural areas with dispersed populations such as Mwaluphamba (less than 2%) and larger urban centers like Mbita (less than 1%), where several alternative providers of financial services exist.

Given the relatively modest membership rates within jurisdictions, who joins the FSA? This question is explored using the following probit regression model.

$$\text{Member} = f(\text{YQuint1-4}, \text{WQuint1-4}, \text{Primary}, \text{Secondary}, \text{Advanced}, \text{NorthLive}, \\ \text{Distance}, \text{CreditSources}, \text{SavingSources})$$

The dependent variable, Member, is a dummy variable taking value one if the household is a member, zero otherwise. Independent variables include a series of income quintile indicator variables, YQuint1 through YQuint4, that reflect each respondent's position in the local cash income⁴ distribution for the previous year. We omit the lowest income quintile, with the other indicator variables reflecting increased local income (YQuint 4 is the top twenty percent of earners locally).

Asset quintiles indicator variables, WQuint0 through WQuint4, were similarly created from the approximate value of each respondent's liquid assets (land, livestock, radios, televisions, watches, and other consumer durables). As with the income quintiles, the lowest asset quintile is excluded from the regression. If FSAs indeed serve their target group of the poorest twenty percent of the population, then the coefficient estimates associated with each of the income and wealth quintile variables should be negative.

Primary, Secondary, and Advanced are dummy variables measuring the respondent's highest level of education completed. If those with higher levels of education typically have access to higher paying jobs and better financial services (even if our coarse measures of asset wealth and income do not fully capture this), and if FSAs serve the poor and uneducated who lack good access to financial services, then the coefficient estimate on these variables should be negative as the omitted category are those who have not completed primary schooling.

⁴ Cash income was computed as the sum of salaries, business income, agricultural sales, livestock sales, and other cash sources.

The dummy variable NorthLive equals one if and only if the respondent belongs to an FSA in Marsabit District and holds their assets exclusively in livestock; it equals zero otherwise. If those pastoralists in the North invested exclusively in livestock are managing risk by utilizing the investment and savings opportunities afforded them by the FSA, then we should expect to find a positive estimated coefficient associated with the NorthLive variable. Several commentators (e.g., Desta, 1999) have called for the expansion of financial services options among these populations in the region, so we investigate whether FSAs facilitate risk diversification for pastoralists.

The independent variable Distance measures distance from the FSA to the respondent's home, measured in minutes via their typical mode of transportation. This variable might have either a positive or a negative relationship with membership. Those located further from the FSA bear the additional cost of travel to and from the FSA. However, those more distant from the central town/village location of the FSA might be in greater need of FSA services as fewer financial alternatives are typically available as one moves further from town.

Does access to loan alternative financial services decrease the likelihood of joining an FSA? The variable CreditSources represents the total number non-FSA (formal and informal) loan sources the respondent accessed in the last year. Typical sources for loans include family, friends, shopkeepers (in the form of goods), traditional banks, moneylenders, NGOs, and ROSCAs. This variable takes on a zero value if the individual did not take a non-FSA loan in the last year. The availability of loan alternatives is hypothesized to have a negative impact upon the decision to become a member. That is, those with fewer loan opportunities are more likely to join the FSA in the attempt to avail themselves of liquidity in times of emergency.

The count variable SavingSources similarly measures the number of places the respondent used in the last year to safeguard cash, excluding the FSA. Typical storage facilities include one's home, one's shop, with a shopkeeper, with traditional banks, and with savings groups. Individuals whose marginal need for security is high might exhibit greater demand for FSA investment and savings. On the other hand, if the availability of other savings mechanisms crowds out the need for FSA services, the coefficient estimate might be negative.

Table 4: Probit results for determinants of FSA membership

Variable	Coefficient	Robust	
		Standard Error	Marginal Effect
YQuint1	0.012	0.098	0.005
YQuint2	0.272***	0.088	0.104
YQuint3	0.138***	0.025	0.054
YQuint4	0.174***	0.036	0.067
WQuint1	0.445**	0.216	0.168
WQuint2	0.072	0.159	0.028
WQuint3	0.178***	0.017	0.069
WQuint4	0.547***	0.105	0.204
Primary	0.066	0.183	0.026
Secondary	-0.119	0.131	-0.047
Adv	-2.176***	0.737	-0.594
NorthLive	0.024	0.065	0.010
Distance	0.002*	0.001	0.001
CreditSources	-0.183***	0.037	-0.072
SavingSources	0.610***	0.053	0.239
Constant	-0.955***	0.121	

n = 574

Pseudo r^2 = 0.2716

We estimated a probit model to test these hypotheses, with robust standard errors clustered on region to preserve asymptotic validity in the presence of potential heteroskedasticity (Table 4). Contrary to the intent of FSAs, the estimation results indicate that the likelihood of FSA membership increases with both yearly annual income and asset wealth. All of the higher quintile coefficients exhibit a positive relationship with Member, with six out of eight statistically different from zero. Respondents who completed post-secondary levels of education (13) are statistically significantly less likely to join the FSA, although this is a very small subsample and the effects of primary and secondary education on membership are statistically insignificant once one controls for relative income and wealth. Overall, it appears that the relatively poor and uneducated are not more likely to become FSA members, indicating that KDA is not reaching its target population.

Distance from the FSA bolsters membership, as reflected in the positive estimated coefficient associated with Distance. Those who live one hour from the FSA are an estimated five percent (60 minutes times a marginal effect of 0.00093% per minute) more likely to belong to the FSA than someone who lives next door. This likely reflects the fact that informal financial service alternatives, such as accounts with shopkeepers or relatively wealthy town dwelling relatives, decrease with distance from centrally-located FSAs, and demand for membership increases with diminishing alternative sources of financial services. If a respondent has access to loans, she has little incentive to join the FSA, as suggested by the negative and significant coefficient estimates on CreditSources. In contrast, SavingSources has a statistically significant and positive relationship with FSA, indicating that those who actively save are more likely to join the FSA.

PURCHASE OF MULTIPLE FSA SHARES

To what extent do those who belong to the FSA utilize FSA services more or less intensively? We consider participation first in terms of shareholdings, both because greater share purchases signal heavier equity investment in the FSA and because of the critical relationship between shareholdings and loan size. Having chosen to join the FSA, what motivates some members to purchase additional shares? The number of shares one owns determines one's borrowing and saving limits with the FSA, so we would expect share ownership conditional on membership to be driven largely by demand for credit and savings products.

Before delving into the regression model, we note that of the 282 FSA members interviewed, 180 purchased only one share, the minimum required for FSA inclusion. Of the 102 members who purchased multiple shares, over half purchased either two or three shares. Amongst multiple shareholders, 46 percent do not save at the FSA, as opposed to 56 percent of single share shareholders. It therefore seems implausible that members are buying multiple shares so as to access higher savings ceilings.

Table 5 presents a breakdown of loans accessed by members by shareholding categories. Of the 180 members who own a single share, only 12% borrowed from the FSA. In contrast, of the 70 members who own between two and five shares, 36% borrowed from the FSA, as did 64% of the 48 members holding more than five shares. Members with large shareholdings not only borrow more frequently than do single share holders, they also borrow larger amounts. Seven members (two percent of the sample) holding more than 10 shares each received eleven loans worth 26% of the total value of loans disbursed, more than the 240 (80.5%) members who owned three or fewer shares combined. Clearly, multiple share purchases are strongly associated with highly concentrated lending patterns.

Table 5: Loans and Loan Value By Shares Held

SHARES	Number of Members	Members Borrowing	% Members Borrowing	Number of Loans	Value of Loans (KSh)	% Value of Loans
1	180	21	12%	25	39,800	9%
2	37	11	30%	18	32,500	7%
3	23	9	39%	11	42,500	9%
4	10	4	40%	7	25,500	5%
5	13	8	62%	12	56,400	12%
6	8	5	63%	8	47,400	10%
7	3	2	67%	2	15,400	3%
8	3	2	67%	3	22,200	5%
9	3	2	67%	2	22,000	5%
10	7	4	57%	9	40,000	9%
10+	11	7	64%	11	123,000	26%
TOTAL	298	75	25%	108	466,700	100%

The following Poisson count data model estimated to establish the relationship between the number of FSA shares owned by the respondent and member characteristics.

$$\text{NumberShares} = f(\text{YQuint1-4}, \text{WQuint1-4}, \text{Savings000}, \text{Livestock}, \text{North}, \text{NorthLive}, \text{Headcount}, \text{InverseMills}),$$

where NumberShares is the total number of shares owned by a member respondent. We use the same income and asset distribution indicator variables described for the membership probit.

Savings000 calculates the total amount of savings held by the respondent, including deposits held at FSAs, measured in thousands of KSh. If access to higher savings limits motivates the purchase of shares, we would expect a positive estimate for the Savings000 coefficient. On the other hand, if loan access is the primary impetus driving the purchase of multiple shares, then

significant cash savings may obviate members' need for a sizeable loan and reduce the incentive to purchase multiple shares.

Livestock is a binary variable taking on value one if the respondent has only livestock assets to liquidate in times of need, and zero value otherwise. If the Livestock coefficient estimate is positive, we can conclude that members whose sole asset is livestock use the FSA as an opportunity to diversify risk, as hypothesized by Desta (1999). Livestock is positively correlated ($r=0.47$) with the North dummy variable, which takes value one if the respondent is a member of one of the four FSAs located in Marsabit District. The interactive dummy NorthLive is the product of the North and Livestock variables. All three dummies are included to specifically test for multiple shareholdings amongst those transitioning out of pure pastoralism in the dry northern regions of Kenya. The variable North is expected to have a negative coefficient. Traditional dependence upon livestock, lower incomes, and a conspicuous lack of profitable entrepreneurial opportunities render the requisite cash for share purchase a rarity. As we will see below, northern FSA members are less active savers than are FSA members elsewhere. Lack of savings dampens one's incentive for purchasing multiple shares. The negative return to share investment renders shareholding an unprofitable investment, negating another motivation to purchase multiple shares. In the Northern FSAs, the sole reason for purchasing multiple shares is to access larger loans.

A positive estimated coefficient of NorthLive, would indicate that pastoralists use FSAs to diversify their asset risk out of livestock. The GL-CRSP PARIMA panel data reveal the average December 2000 price of a male goat and a male sheep in North Horr was 711 and 870KSh, respectively, equivalent to 2-3 FSA shares. Survey data reveals that the average North Horr FSA member's livestock holdings included 44 smallstock (sheep and goats), equivalent to

at least 80 FSA shares. In addition, no member held fewer than 10 smallstock. If pastoralists prefer to diversify risk and invest or save in the FSA, the regression should yield positive coefficient estimates for NorthLive. Similarly for members in the Coast or Nyanza Provinces holding asset wealth exclusively in livestock, heavy investment in the FSA might be a good risk management strategy, so we predict a positive relationship between Livestock and FSA shares held.

We control for regional poverty by including the Headcount independent variable, as defined previously. Members from poorer locations with limited financial service availability might find FSA investment particularly attractive, leading to greater share purchases at the intensive margin.

Finally, we include the inverse Mills ratio, *InverseMills*, as calculated from the membership probit estimated in the previous section. If the coefficient estimate on the inverse Mill's ratio is significantly different than zero, this corrects for the selection bias associated with choosing to become a member of the FSA (Heckman, 1979).

Table 6 presents the results of the Poisson regression. If multiple share ownership were driven by demand for diversification into savings, the correlation coefficient with nonfinancial wealth should be positive. The fact that multiple FSA share ownership is instead negative and statistically significantly associated with household nonfinancial wealth underscores that multiple share ownership appears driven by members' demand for credit, as opposed to savings. This is also reflected in the strongly positive and statistically significant relation between household income and multiple share ownership. It takes money to buy shares and, as we shall see, to borrow money.

Table 6: Poisson Regression Results for Number of Shares Owned

Variables	Coefficient	Standard Error	Marginal Effects
YQuint1	0.167	0.149	0.056
YQuint2	0.148	0.141	0.049
YQuint3	0.256**	0.131	0.088
YQuint4	0.697***	0.131	0.284
WQuint1	-0.412***	0.141	-0.117
WQuint2	-0.427***	0.140	-0.121
WQuint3	-0.061	0.131	-0.019
WQuint4	-0.252**	0.133	-0.075
Savings000	-0.006***	0.002	-0.002
Livestock	-0.174*	0.100	-0.055
North	-0.405**	0.184	-0.121
Northlive	0.124	0.225	0.041
Headcount	-0.002	0.002	-0.001
Invmillsrat	-1.384***	0.107	-0.442
Constant	1.466	0.179	

n = 574

Pseudo $r^2 = 0.181$

This inference is further reinforced by other regression coefficient estimates. The negative and statistically significant coefficient estimate on the inverse Mills ratio, signals that holding other member characteristics constant, multiple share ownership is negatively associated with the probability of membership. This result suggests that membership is undertaken strategically by those seeking the relatively high levels of credit made accessible through multiple share ownership. Similarly, holding other cash savings crowds out multiple FSA share ownership, as indicated by the negative coefficient estimate associated with the Savings000

variable. Members holding their assets exclusively in the form of livestock as well as members of the northern FSAs are less - not more - likely to purchase multiple shares. Substantial decline in northern FSA share values render multiple shareholdings unattractive, mirroring McPeak's (2005) observation that livestock remains a more remunerative form of savings than do financial assets held in banks.

USE OF FSA SAVINGS INSTRUMENTS

As explained previously, the FSA generates its own capital entirely from sales of shares because the reserve requirement on savings is 100%. What explains member's decisions to avail themselves of the savings instruments offered by FSAs? 34 percent of the 299 members interviewed had used FSA savings, though this ratio drops to less than 5 percent of the 88 northern FSA members. Members holding savings balances were asked about their motivations for savings with the FSA. Conversely, members who do not save at the FSA were asked why they choose not to.

The most frequently cited reason for saving with the FSA was easy access to deposits in times of need. In addition, savers appreciated FSA proximity, security, and the opportunity to accumulate capital to achieve long-term investment goals. A few of the Kwale and Migori FSAs were in the process of requiring savings to access loans, as reflected in nearly eight percent of savers citing the desire to access loans as the motivation for saving at the FSA.

Lack of funds dominated the reasons offered for not saving at the FSA. Lack of accessibility and lack of security ranked a distant second and third. All the respondents who did not save at the FSA for lack of trust in the institution were from the North, including the wife of

the Chairman of the Board of one FSA! Similarly all who attribute not saving at the FSA to lack of information about savings services are from the North, as are eighty percent of those concerned with the zero interest paid to deposits. Despite the scarcity of savers at Northern FSAs, there might exist a latent demand for savings not serviced by FSAs due to poor community image, lack of trust, a stagnant rate of return, and poor information dissemination.

BORROWING FROM THE FSA

Of the sampled FSA membership, only 15 percent borrow from the FSA. Those 85 percent investing in the FSA without borrowing bear, in the value of their share holdings, the default risk of the minority of members who do take out loans. We already observed that the likelihood of borrowing generally increases in the number of shares owned, which is itself positively related to income and negatively associated with nonfinancial wealth, including nondiversified holding of livestock assets. We now explore in greater detail the question of which members borrow from the FSA.

We investigate this question using the following probit regression model with the dependent variable FSA_{Loan} which equals one if the member borrowed from the FSA, zero otherwise.

$$FSA_{Loan} = f(Y_{Quint1-4}, W_{Quint1-4}, NumberShares, CreditSources, Savings000).$$

Most of the independent variables have been previously defined, in particular the income and wealth quintile variables. In order to further define the relationship between shareholdings and borrowing, the variable $NumberShares$ is included as a regressor. Controlling for the number of shares a member owns, we want to establish whether borrowing is related to income or wealth. Similarly, is our earlier hypothesis that borrowing demand motivates the purchase of

multiple shares substantiated by a positive association between borrowing and the number of shares a member owns, controlling for income and wealth?

Table 7: Probit Regression Results for FSA Borrowing

Variable	Coefficient Estimate	Standard Error
YQuint1	0.485	0.312
YQuint2	0.116	0.328
YQuint3	0.134	0.325
YQuint4	0.869***	0.331
WQuint1	-0.097	0.303
WQuint2	-0.655*	0.336
WQuint3	-0.613*	0.334
WQuint4	-0.521	0.345
Numshares	0.072***	0.019
Creditsources	0.024	0.090
Savings000	-0.112**	0.055
Constant	-0.914**	0.361

$$n = 489 \quad \chi^2 = 32.44 \text{ (p-value} = 0.00)$$

Estimation results are presented in Table 7. The coefficient estimates associated with the income quintiles suggest that it is not the poorest 20 percent of the population that receives loans. Rather, members in uppermost income quintile are the most likely to receive FSA loans, contrary to KDA's stated objective. Likelihood of borrowing is weakly, negatively related to nonfinancial wealth. The number of FSA shares owned has a strongly positive and statistically significant effect on borrowing, even controlling for member income and wealth, which we earlier established are key determinants of multiple share ownership. This reinforces our

conclusion that multiple share ownership is motivated primarily by members' desire to access loan capital.

The negative coefficient estimate associated with the non-FSA savings variable indicates that those with adequate savings are less likely to borrow from the FSA. Savings provide a substitute vehicle for members to self-insure against income shocks and to accumulate investment capital. Since the opportunity cost of savings, current consumption, is often lower than the cost of interest-bearing loans, members with liquid savings are commonly better served saving rather than borrowing.

FSA LOAN REPAYMENT

We have established that higher income individuals are more likely to become members of the FSA. Conditional upon having chosen to join the FSA, those members with the highest incomes are more likely to borrow from the FSA and to purchase multiple shares, allowing them to access higher value loans. We have also seen that FSA share value have been declining, on average, across KDA's FSAs, with the decline strongly related to the number of generations of loans the FSA has made. This strongly indicates that loan repayment is a problem for FSAs. The borrowing pattern evident in the data, including multiple share ownership patterns, raises the possibility that FSAs are not serving the poor as delineated in KDA's stated goals. Given that poorer members are less likely to borrow but hold shares which erode at the same rate as all other members' shareholdings, and that higher income members are more likely to borrow, and in larger amounts, then FSAs might be inadvertently facilitating de facto transfers from poorer to wealthier members if these better-off borrowers are not reliably repaying loans. Exploring loan

repayment patterns becomes essential if we are to understand the distributional effects of FSAs in Kenya.

Analyzing loan repayment behavior is tricky, however. Seventy five of the 298 members in the sample took loans ranging in size from 500 to 35,000KSh, with a mean of 6,223KSh and a median of 3,600KSh. But when we asked about loan repayment behavior, all but eight respondents claimed to have repaid their loans on time, and those eight reported suffering no negative consequences as a result of their delinquency. Evidence presented by FSA records disputes the veracity of these payment claims, as we demonstrate below. Reconstructing loan repayments from respondent recall is unconstructive, thus we turn from the survey data to an alternate data source for loan repayment analysis: FSA records.

The quality of FSA records fluctuated from site to site, ranging from well-kept general ledgers to scraps of cash-in and cash-out vouchers. FSAs varied tremendously in their thoroughness of bookkeeping due to Manager's education level, training received from KDA, frequency of FC contact, staff turnover rate, as well as the detail of information demanded by the local Board of Directors. It was not uncommon for the staff and board members to have no idea about FSA share value, nor how to compute it. Share value was often calculated exclusively by KDA auditors who arrived once each year to evaluate books, confirm deposits, and assess share value.

We gathered data on 894 loans, or 91.6% of the 983 total loans issued by nine FSAs. Loans from the remaining five sampled FSAs were not included in analysis due to lack of data either owing to time constraints (Rongo, Magunga, and Msambweni), because loans had not yet been issued (Kikoneni), or because loans issued were not yet due (Kalacha). Although 983 loans were issued by these nine FSAs, we were unable to extract information from 89 of them due to

missing records. This near-census of loans was taken out by a broader range of members than those randomly sampled. Unfortunately, these data lack some of the information the survey included, most notably member income, asset, and characteristic information. We are not aware of other published studies that analyze microfinance data at this level of detail.

The 894 loans under examination can be divided into two broad categories: regular and emergency loans. Regular loans require the approval of FSA-specific Credit Committee and can take up to a full month before approval and disbursement. The regular loan application is quite cumbersome, requiring information such as years at current residence, loan purpose, sources of income, projected income, and two guarantors. In addition, the FSA Manager must assess the moral character of the applicant and recommend the Credit Committee review the loan application. The terms of regular loans vary from FSA to FSA, but generally are to be repaid monthly over a three to six month term at an interest rate of ten percent per month on a reducing balance. Eighty three percent of the loans under investigation are regular loans.

In contrast, emergency loans are issued upon demand at the Manager's discretion. The cost of the expedited process is reflected in the shortened, one month term, as well as a higher interest rate, between 12 and 15 percent per month. The significance of emergency loans varies widely across FSAs. While over one third (52 of 145) of Karungu's loans were emergency, at the other extreme, Tiwi and Kalacha did not issue emergency loans at all. Emergency loans are generally smaller than regular loans, and comprising only 6.5% of total loan value, although they represent 17% of all loans issued.

The distinction between emergency and regular loans reflects different screening mechanisms. Emergency loan evaluation is the exclusive domain of Managers. As opposed to regular loans which complement manager evaluation with peer screening by the FSA credit

committee, emergency loans rely on peer monitoring solely to guard against moral hazard or loan default ex post of a lending decision. If ex ante peer screening reduces the lending risk associated with adverse selection, this should render emergency loans riskier than regular loans, hence the different terms on the loan types. Comparison of emergency and regular loan repayment performance, while controlling for loan size, permits us to separate the effects of ex post peer monitoring (present in both) from ex ante peer screening (present in regular loans only).

Loan Repayment

Of the 894 FSA loans issued in sample, 59% (579) were paid in entirety, 13% (113) received no principal repayments, and principal was partially repaid for the remaining 28% (202). Thus, 35% (315) of the 894 loans were in arrears, defined as loans with principal past due. The amount in arrears represents 24% of the total value of loans issued, and 64% of total share capital. On average, 61% of principal due had been paid on the 315 loans in arrears.

Of the loans in arrears, 13 percent are emergency loans, which represent 17% of all loans. Although we hypothesized that due to the additional rigor of the regular loan approval process might cause emergency to default at a higher rate than regular loans, this does not appear true, implying that the credit committee does not effectively screen out high risk loans. Indeed, scant discrimination among loan applications is evident. For example, the Credit Committee turned down only 2.4% (3/340) of loan applications to the North Horr FSA. This calls into question the assumption that the local Board of Directors harness superior local knowledge so as to protect FSA assets against loans with high levels of ex-ante credit risk. Mude (forthcoming) posits that the intricate nature of social relations binding community members makes it personally

beneficial for volunteer Board of Directors members to issue loans, despite a priori shared knowledge that applicants are bad credit risks. Rejecting loan applications ex ante or enforcing penalties ex post results in disutility borne personally by FSA officials in the form of rancor, ill-will, strained social relations, etc. On the other hand, the disutility of delinquent loans is distributed across all shareholders. If the personal costs to officials of loan applicant rejection outweigh the personal costs these officials bear as shareholders due to issuing risky loans, then it becomes individually rational for FSA officials to issue loans expected to under-perform, and not to pursue on-performing loans. Of course, this “loans makes friends” hypothesis turns the canonical logic of Stiglitz (1990) – that “friends make loans” – on its head.

It is informative to look at loan repayments rates by loan size. Recall that the upper bound on loan size is a direct function of shares held by the borrower, which we earlier established is strongly and positively associated with income. If the relatively poor face more difficulties in repaying their loans, we would therefore expect repayment rates to vary inversely with loan size. However, descriptive statistics reveal that loans of 1,200KSh and below have no higher a rate of default (39%) than any other loan group. In fact, the largest loans, of 15,000KSh and more, suffer the highest default rate (53%). Although shareholding is positively associated with income, it does not appear to signal increased propensity to repay.

To explore repayment rates in more detail, we estimate the following doubly-censored Tobit model, censored at both zero and one hundred percent, relating loan repayment percentage to loan size, type of loan, and location as captured through site specific dummy variables.

$$\%Repaid = f(\text{Principal000}, \text{Emergency}, \text{Headcount}, \text{AvgAltern}, \text{SiteSepcificDummies})$$

%Repaid is a continuous variable from zero to one capturing the percentage of principal repaid on a loan. Principal000 reflects loan size (in thousands KSh). If larger loans are indeed more

prone to default, then we would expect a negative coefficient estimate on Principal000.

Emergency is a dummy variable, equaling 1 if the loan issued was an emergency loan, 0 for a regular loan. Though theory predicts that less carefully screened emergency loan applications should default at a higher rate, the descriptive statistics suggest no such unconditional effect.

Moreover, since emergency loans are smaller and the unconditional descriptive statistics suggest that larger loans default at a higher rate, the loan size effect could be masking the loan screening effect on repayment performance.

Headcount once again measures the local incidence of poverty. If members from poorer areas have additional incentives to maintain their access to FSA financial services, then we would anticipate a positive relationship between the percentage of the population living beneath the poverty line and the percentage of loan principal repaid. AvgAltern measures the site-specific average number of non-FSA credit and savings alternatives used by respondents within the last year, as extrapolated from the 574 individual surveys referenced earlier. We would predict that the more financial service alternatives available to and used by respondents, the less likely respondents are to safeguard their reputation with the FSA and the lower their probability of repaying principal owed. Site specific dummy variables control for characteristics particular to each FSA. Eight site-specific dummies each take on value 1 if the FSA is located at that site, 0 otherwise, with North Horr the omitted site.⁵

The estimated relationship between principal repaid and repayment percentage is negative and statistically significant, confirming that repayment is decreasing in loan size (Table 8). Those with the largest loans default most. We already established that the probability of borrowing and the number of shares held (and thus a member's borrowing limit) are positively and significantly related to household income. Thus it appears that the highest income FSA

⁵ The other site dummy variables were ultimately dropped due to perfect multicollinearity with the other covariates.

members are most likely to default and the lowest income members are least likely to borrow or default. The implication is that poorly performing FSAs are providing a de facto mechanism for regressive transfers from lower income non-borrowing members to higher income, borrowing- and-defaulting members.

Table 8: Tobit Regression Results for Proportion of Principal Repaid

Variable	Coefficient Estimate	Standard Error
Principal000	-0.017**	0.008
Emergency	0.064	0.117
Headcount	0.013***	0.005
AvgAltern	-0.215**	0.106
LungaLunga	0.691***	0.231
Tiwi	0.852***	0.201
Karungu	0.564**	0.259
BadhaHuri	0.786***	0.255
Korr	0.565**	0.253
Constant	0.178	0.444

n = 894 Pseudo $r^2 = 0.164$

The coefficient associated with the dummy Emergency variable though positive, is not significant, implying that the distinction between emergency and regular loans is irrelevant in terms of loan performance and contravenes the standard theoretical prediction. Rather, it is consistent with Mude's (forthcoming) model of socially-constrained lending behavior. The one-day, one-person screening for emergency loans is just as ineffective in terms of screening out bad credit risks as the lengthy process involving the Board of Directors. Given equally effective ex

ante screening and ex post monitoring, lower costs of administration, higher rates of interest, and faster loan cycles, one wonders why other FSAs haven't followed Karungu's lead, disbursing emergency loans with gusto.

The coefficient estimate on the Headcount variable is positive and significant, affirming that loans made in poorer areas exhibit higher rates of repayment. Note that this effect is independent of the relationship between poverty and the availability of alternative financial services providers, which has a negative and significant association with the percentage of principal repaid.

Implications of Loan Size and Loan Delinquency

The repayment rate difference between large and small loans has acute repercussions. The 269 loans of 1,200KSh or less represent a mere 7% of total portfolio value. In contrast, the 200 loans greater than or equal to 10,000KSh comprised 60% of the principal borrowed (Table 9). FSAs are heavily exposed to default risk associated with large loans, which are typically made to higher income members. Indeed, the value of the principal in arrears on the 20 loans greater than 15,000KSh that have not fully repaid (286,006Ksh) is comparable to the total principal paid out in the smallest 269 loans (304,450KSh). The 20 largest loans in default represent 14% of total share value for the 2,886 total KDA members across 9 sites. The minimum investment value of the shares required to access these large loans is greater than the total annual incomes of 66% of the survey respondents who purchased only one share.

Perhaps surprisingly, these figures give an optimistic view of the situation. Whether due to unwillingness or lack of training, most FSA managers do not calculate the interest and penalties on loans according to the standardized KDA accounting formulae. Using the original

loan information, we revised the arrears calculations to conform to the FSA's official published accounting terms: the regular interest rate of 10% per month paid on a reducing balance increases to 15% per month if principal is past due. In addition, penalties not collected are compounded with the principal outstanding, and themselves penalized at the rate of 15% per month. Late payments made on the revised accounts were applied against interest and penalties accrued before principal.

Table 9: Distribution of Loans and Official Account of Loans In Arrears By Loan Size

LOAN SIZE, KSH	1,200	2,400	3,600	6,000	10,000	15,000	15,000+
Number of Loans	269	134	114	178	100	53	53
Loan Value, KSh	306,450	293,150	374,000	974,300	860,700	649,600	1,177,600
% of Loan Value	7%	6%	8%	21%	19%	14%	25%
Loans in Arrears	104	57	39	79	44	28	20
Value in Arrears	79,265	79,054	88,814	263,359	249,792	230,676	286,006
Value in Arrears/ Total Value	26%	27%	24%	27%	29%	36%	24%
Value in Arrears/ Total Arrears	6%	6%	7%	21%	20%	18%	22%

With these accounting corrections, the performance of FSAs becomes worse. After recalculation, 729 of the 894 total loans were in arrears, totaling 39% of loan principal, or 78% of share capital. In contrast, the official accounts calculated principal outstanding as 24% and 64% of loan principal and share capital, respectively. Accurate accounting more than doubles the number of loans with 90 to 100% of principal past due from 88 to 190. When we look at the distribution of the numbers of loans and arrears across loan size (Figures 1 and 2), it becomes evident that the vast majority of loans are not repaid in their entirety. If penalties were properly

assessed, few loans would show completely clear accounts. The value of the principal past due on the largest 206 loans of 10,000KSh or more now increases to 25% of the total principal issued, or 53% of the current portfolio. The increased principal in default results in average share value loss of 78%, with over half of this loss attributable to 184 defaulting members, each holding loans of 6,000KSh or more.

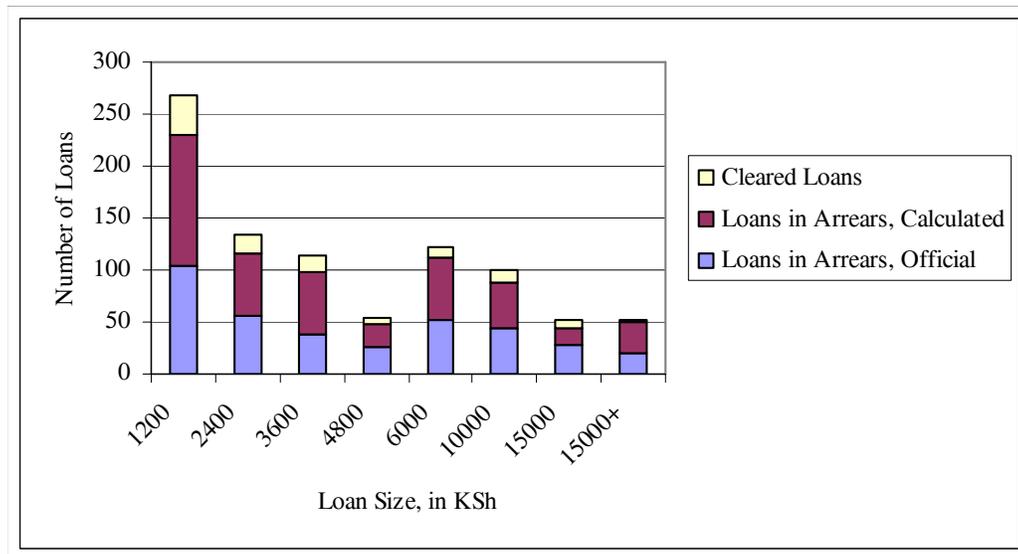


Figure 1: Distribution of Loans Across Loan Size, Correctly Calculated

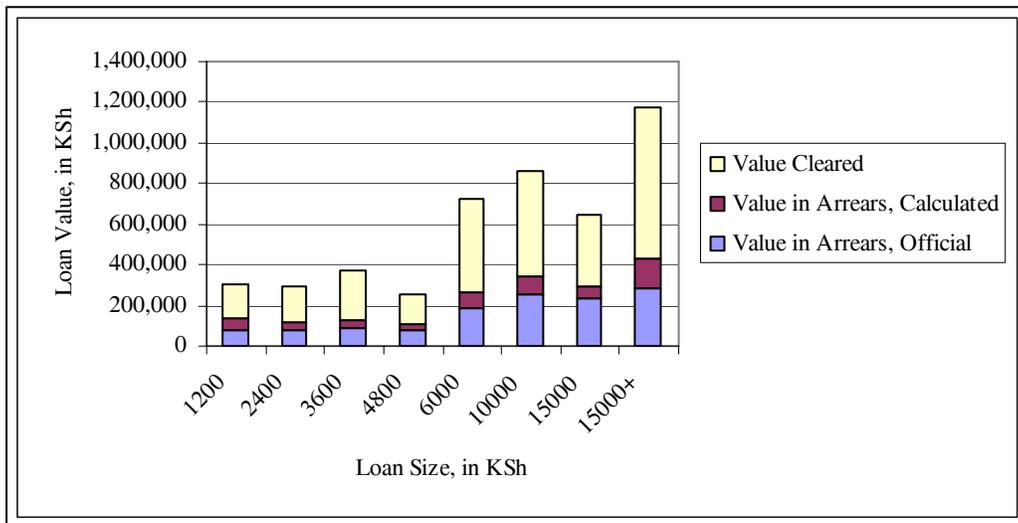


Figure 2: Distribution of Loan Value Across Loan Size, Correctly Calculated

CONCLUSIONS

KDA FSAs serve primarily higher income individuals, who not only are the most likely to become members, but are also most likely to borrow, to purchase multiple shares and thereby to take out larger loans, which we have demonstrated default at a higher rate than smaller loans. Unsustainably high rates of loan delinquency seriously erode share value and threaten FSA financial viability. Thus, despite their stated mission, KDA FSAs are typically bypassing the poorest members of the communities they serve and implicitly fostering regressive wealth distribution from lower-income, non-borrowing members to higher-income members more likely to take out and default on large loans. An important lesson to learn is that without careful analysis of the patterns of benefits reaped and the bearers of costs borne, we cannot accept at face-value that an initiative is “pro-poor”.

So what can be done to improve this situation? First, by linking loan limits to shareholdings, FSAs reserve large loans for those with sufficient disposable income to purchase of multiple shares. Decoupling loan size and shareholdings would allow for more progressive lending, whereby larger loans are issued based upon an established credit history of successfully paying back smaller loans. Then, the FSA could better direct loans toward the creditworthy poor, as opposed to the relatively wealthy who can afford multiple shares. This policy change could have particular impact in the northern FSAs, where the loan size available to poorer members holding only one share is insufficient to cover the costs of transportation into town, thereby effectively precluding productive investment of borrowed capital.

Improved ex ante screening and ex post monitoring of loans is plainly necessary. Protection of equity investment does not appear to provide adequate motivation for rigorous loan

application screening and loan monitoring by Boards of Directors. Though this decentralized approach taps into local knowledge, it can also be encumbered by local-level power relations and social considerations that make it rational for the Board to approve loans to uncreditworthy borrowers and not to pursue bad debt (Mude forthcoming). It might be worth exploring compensation schemes for Board members who supervise a healthy portfolio so as to offset the personal costs incurred when Boards reject loan applications and exercise personal influence and moral suasion to recover delinquent loans.

To protect share capital, not only do KCM's have to be trained in their role of screening member loan applications and pursuing defaulters within their group, but additional training of staff and board members in loan screening, accounting, and management is required to confer basic tools for managing a microfinance institution. In the FSA model, joint liability reigns in the entire membership as all members have an equity investment to protect. However, if the bookkeeping is not accurate, if a list of defaulters is not compiled, if current share value is an unknown, if vital statistics about the health of the FSA is not available, then members are not empowered with the knowledge to protect their microfinance institution. Lack of technical skills including bookkeeping, interest and penalty calculation, auditing, and computation of current share value threatens the FSA.

To avoid the inefficiencies of multi-layered bureaucracy, funds were designated by KDA's donors for the opening of FSAs as opposed to the maintenance of FSAs. Limiting investment to start-up costs, however, results in insufficient administrative support for KDA's support operations, including training of FSA staff, FSA board members, and KDA Field Coordinators. Particularly in the North, with poor roads and infrequent passenger vehicles, FSAs

operate almost independently, with negligible help from field coordinators who have vast territories, no vehicles, and limited institutional support.

A shift in priorities from loan issuance to providing secure savings might be the most effective means to improve FSA financial viability and to serve the poor. This would require reducing fixed fees (e.g. passbook charges) and offering interest payments so that smaller deposit volumes can earn a reasonable rate of return. It would also require relaxing the present 100% reserve requirement on savings deposits. Without a structural change in FSA bylaws however, FSAs will continue to prefer to collect share capital to invest rather than to amass unproductive savings deposits.

REFERENCES

- Adams, D. W., and von Pischke, J.D. (1992). Microenterprise Credit Programs: Déjà vu. *World Development*, 20 (10), 1463-1471.
- Besley, T., and Coate, S. (1995). Group Lending, Repayment Incentives and Social Collateral. *Journal of Development Economics*, 46 (1), 1-18.
- Central Bureau of Statistics. (2001). *1999 Population and Housing Census. Vol 1: Population Distribution by Administrative Areas and Urban Centers*. Nairobi: CBS, Ministry of Planning and National Development.
- Central Bureau of Statistics. (2003). *Geographic Dimensions of Well-Being in Kenya: Where Are the Poor? From Districts to Locations. Vol. I*. Nairobi: CBS, Ministry of Planning and National Development.
- Christen, R.P. (1998). Keys to Financial Sustainability. In M.S. Kimenyi, R.C. Wieland, and J.D. von Pischke (Ed.) *Strategic Issues in Microfinance* (pp. 193-186) Ipswich Book Co. Ltd.: Suffolk, England.
- Conning, J. (1999). Outreach, Sustainability and Leverage in Monitored and Peer-Monitored Lending. *Journal of Development Economics*, 60 (1), 51-77.
- Desta, S. (1999). Diversification of Livestock Assets for Risk Management in the Borana Pastoral System of Southern Ethiopia, PhD Dissertation. Logan, UT: Department of Rangeland Resources, Utah State University.
- Government of Kenya . (2000). Incidence and Depth of Poverty. Vol. 1. Nairobi: Ministry of Finance and Planning.
- Hollis, A. and Sweetman, A. (1998). Microcredit: What Can we Learn from the Past? *World Development*, 26 (10), 1875-1890.
- Hulme, D. and Mosley, P. (1996). *Finance Against Poverty*. London: Routledge.
- Jazayeri, A. (1996). Financial Services Association (FSA) – Concept and Implementation Arrangements, Document. IFAD.
- Jazayeri, A. (2000). Financial Services Association (FSA) – Concept and Some Lessons Learnt, Document. Kampala: FSA International.
- McPeak, J. G. (2003). Analyzing and Addressing Localized Degradation in the Commons. *Land Economic*, 78 (4), 515-536.
- McPeak, J G. (2005). Individual Rationality and Collective Rationality in Pastoral Production: Evidence from Northern Kenya. *Human Ecology*, 33(2), 171-197.

- McPeak, J. G. and Little, P.D. (2005). Cursed If You Do, Cursed If You Don't: The Contradictory Processes of Pastoral Sedentarization in Northern Kenya. In E. Fratkin and E. Roth (Ed.), *As Pastoralists Settle: Social, Economic, and Health Consequences of Pastoral Sedentarization in Northern Kenya*. Dordrecht: Kluwer Academic Publishers.
- Morduch, J. (2000). The Microfinance Schism. *World Development*, 28 (4), 617-629.
- Mude, A. (Forthcoming). Making Loans to Make Friends: Explaining the Dismal Performance of Financial Service Associations, *Agricultural Finance Review*.
- Pearce, D. and Helms, B. (2001). Financial Service Associations: The Story So Far, Document. Consultative Group to Assist the Poorest.
- Pederson, G. D. and Kiiru, W.K. (1997). *Kenya Rural Enterprise Program: Case Study of a Microfinance Scheme*. Washington D.C.: World Bank.
- Stiglitz, J. E. (1990). Peer Monitoring and Credit Markets. *World Bank Economic Review*, 4 (3), 351-366.
- White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica* 48(4), 817-830.
- Woolcock, M. J.V. (1999). Learning from Failures in Microfinance: What unsuccessful Cases Tell Us About How Group-Based Programs Work. *The American Journal of Economics and Sociology*, 58 (1), 17-42.
- Yaron, J. (1994). What Makes Rural Finance Institutions Successful? *The World Bank Research Observer*, 9 (1), 49-58.
- Zeller, M., Schrieder, G., Von Braun, J., and Heidhues, F. (1997). *Rural Finance for Food Security for the Poor: Implications for Research and Policy*. Washington, D.C.: IFPRI.