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Lending to Agribusinesses in Zambia

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Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Portland, OR, July 29-August 1, 2007

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Abstract

Microfinance has been celebrated in the last decade as a new paradigm shift in lending that has achieved immense success in improving the living standards of the poor through the provision of financial services. Institutions involved in microfinance around the world have used innovative loan contract mechanisms to profitably lend to the poor and achieve very high repayment rates while allowing the borrowers to profit and grow their enterprises. While high repayment rates have been realized by microfinance institutions focused on lending to consumers and to retail-type micro enterprises, few microfinance institutions focused on lending to agricultural producers have achieved comparable success. This article compares the mechanisms employed by major microfinance institutions with a successful lending institution in Zambia that serves agricultural businesses. Findings are: ZATAC uses progressive lending and group lending contracts adapted in some ways to suit seasonal agricultural production credit requirements. The institution also uses various forms of collateral substitutes like other microfinance institutions. We also find that ZATAC uses other mechanisms such as automatic loan repayments tied to production, cooperative sanctions, contracted production and provision of business development services that eventually improve loan repayments significantly and enable the lender to lower interest rates.

Microfinance Around the World

Microfinance is a relatively new concept in the finance world that has rapidly evolved in the last two decades. Its popularity has mainly been with its use of various innovative approaches to providing financial services to the poor, who would not qualify for these services from the conventional formal lending institutions. Microfinance has been broadly defined as the provision of a broad range of financial services such as deposits, loans, payment services, money transfers, and insurance to poor and low-income households and their micro enterprises (ADB 2000). Unable to provide sufficient collateral to obtain loans from the traditional banking system, even when they had viable

projects, rural people often found themselves in a poverty trap, with the only option being local money lenders who charge very high interest rates. The advent of microfinance has seen a considerable shift in access to financial services by rural people in many developing countries that some have called "local revolutions" (Madajewicz 2003).

The phenomenal developments in microfinance in the last two decades have sparked interest in multilateral lending agencies, bilateral donor agencies, developing and developed country governments, non-government organizations (NGOs) and a variety of private banking institutions to support its development (Asian Development Bank 2000). The 2006 award of the Nobel Peace Prize to Muhammad Yunus, founder of the Grameen Bank in Bangladesh and a pioneer of microfinance, attests to the place microfinance has reached in poverty alleviation and the economic development of developing nations. In awarding the prize, the Nobel Foundation stated that the prize was being awarded for the recipients' "efforts to create economic and social development from below" (Nobel Foundation 2006).

A wide range of studies have been conducted to understand the specific features that have enabled microfinance institutions to lend profitably to the poor and record usually very high loan recovery rates while fostering growth in the real net worth of the borrowers. Morduch (1999) examines some important mechanisms used by microfinance institutions by comparing institutions diverse in the type of models used and the target groups. The study largely features the Grameen Bank of Bangladesh, Bancosol of Bolivia, Bank Rakyat of Indonesia, Kredit Desa of Indonesia and the FINCA village banks throughout Indonesia and Latin America, thus drawing a diverse set of microfinance institutions both geographically and operationally. Morduch identifies five

key mechanisms used by these institutions to achieve high repayment rates, namely, peer selection, peer monitoring, dynamic incentives, regular repayment schedules and the use of collateral substitutes.

Peer selection and peer monitoring result from the use of group lending contracts which entail joint liability for loans by the borrowers, thus giving an incentive for self-sorting among the borrowers as they try to avoid partnering with risky borrowers. This, in a sense, shifts some of the monitoring burden to the borrowers themselves and can actually help the lender minimize the adverse selection effect resulting from asymmetric information. It is also one way of ensuring that borrowers exercise prudence in the use of funds so that the likelihood of repayment is enhanced (Stiglitz 1990). On the other hand, other studies (Madajewicz 2003) have found that this assortative matching effect of group lending contracts only works with the poorer borrowers and does not hold for the wealthier among the poor. Nevertheless, group lending has been used even in developed nations such as the United States, though at a smaller scale (Prescott 1997).

The third mechanism, dynamic incentives, refers to a lending and information generation mechanism in which the lender starts with very small loans and gradually increases the loan size as customers demonstrate reliability (Amendariz and Morduch 2005). Morduch (1999) finds that through the repeated nature of the interactions with borrowers and the threat to cut off lending when loans are not repaid, dynamic incentives can be exploited by microfinance institutions as a mechanism for securing high repayment rates. He further finds that the incentives are enhanced further if borrowers can anticipate the stream of increasingly larger loans.

The fourth contractual mechanism identified in the research is the use of frequent regular loan repayment schedules, such as weekly repayments, a mechanism used by many microfinance institutions to give an early warning of problem borrowers so that lenders can remedy the situation before it worsens. Finally the use of various forms of collateral substitutes, including group tax and "forced savings" which borrowers cannot withdraw until after a specified length of period, provide alternative forms of demonstrating financial commitment, replacing the conventional collateral required by banks.

Despite the abundant literature available on the evolution and developments in microfinance, most of it has focused on microfinance programs that give consumer loans, lend to retail-type micro enterprises, or other very short duration activities. This is largely because most of the microfinance programs have concentrated on such type of lending. Examples of successful agricultural production microfinance programs around the world are not many. One possible explanation could be that the risks inherent in seasonal agricultural production have deterred micro lending programs from financing such activities. It is important to note, however, that in many developing countries, the rural poor depend on agricultural activities for their survival and agriculture makes up a considerable proportion of these countries' gross domestic product – 21.5% in the case of Zambia in 2005 (UNDP 2006). It is for this reason that this article examines an agribusiness lending institution in Zambia – the ZATAC Investment Fund (ZIF), with an eye towards identifying whether the mechanisms discussed above are employed in this successful microfinance program.

ZIF is an agribusiness lending program in Zambia that was established in 2002 with the support of USAID with the aim of helping commercialize smallholder agricultural production. Having been in operation for five years, ZIF, which operates under the umbrella of ZATAC Ltd., a non-profit company, has already become a major vehicle for increasing the incomes of rural agricultural producers. The government of Zambia, international non-governmental agencies, bilateral donor agencies and multilateral lending agencies such as the World Bank, African Development Foundation and the Swedish International Development Agency have recognized ZIF as an effective means of channeling funds for the improvement of rural agricultural production in the country. Although ZIF lends to established medium-to-large sized agribusiness companies that provide markets to rural producers, more than 95% of its borrowers are rural small-scale producers, organized into cooperatives.

This article examines whether the lending mechanisms discussed for other microfinance institutions around the world are employed by ZIF. The research questions are:

(i) Are the lending mechanisms in ZIF the same as the other leading microfinance institutions worldwide, or have they been adapted for the situation in Zambian agriculture?

(ii) What modifications are used to specifically deal with seasonal production based lending?

To deal with these questions, we need to understand both the environment in which microfinance institution operate and the complexities faced by such institutions in providing loans profitably to the poor. In the next section we discuss an economic

framework for inter-temporal choice decisions made by lenders and borrowers in the microfinance markets and determination of interest rates by lenders, leading to the theory of credit rationing.

Economic Framework

The microfinance industry operates in the financial markets, which are economic in nature but affected by complexities of risk and timing. In this section, an exposition of the basic economic logic behind financing decisions is provided. Subsequently, the key principles of the more advanced theories of credit provision will be described. The issues of incomplete information and incentives will then be linked specifically to the conditions of microfinance.

Financing decisions arise because individuals can choose to maximize their utility over multiple periods of time, in addition to choosing between different goods based on the prices of the goods relative to the contribution of the goods to the individual's utility. Consider a simple two-period conceptual framework (Nicholson 2005). The consumer chooses between consumption in the present or consumption in the future, subject to a constraint that reflects current income. The consumer has the option of investing the portion of income not spent on present consumption and earning a rate of return. Successful investment or savings enable future consumption to be greater than would otherwise have been possible.

The two-period consumption choice can be represented graphically, as depicted in figure 1. Present consumption is represented by C_0, while future consumption is represented by C_1. The individual's budget constraint is represented by

$$I = C_0 + P_1 C_1 \ , \qquad (1)$$

where P_1 represents the present cost of future consumption and I represents current income. The "price" of future consumption is re-written in the financial discounting style as:

$$P_1 = \frac{\Delta C_0}{\Delta C_1} = \frac{1}{1+r} \ , \qquad (2)$$

where *r* represents the rate of return between the current and future periods. Combining the two equations yields a budget constraint of :

$$I = C_0 + \frac{C_1}{1+r} \ . \qquad (3)$$

Utility for this individual is maximized at C_0^*, C_1^*. By rearranging the terms in the budget constraint and substituting for P_1, future consumption can also be found:

$$C_1^* = (I - C_0^*) / P_1 \qquad (4)$$

$$C_1^* = (I - C_0^*)(1 + r) \ . \qquad (5)$$

Equation (5) means that current savings, $(I - C_0^*)$, can be invested at rate of return *r* to yield C_1^* in the next consumption period. The concept of utility maximization is illustrated in figure (1). For a general utility function, U, an individual will choose to maximize their utility by consuming at point C^*_1 and C^*_0, the point of tangency of the individual's utility function and the budget constraint.

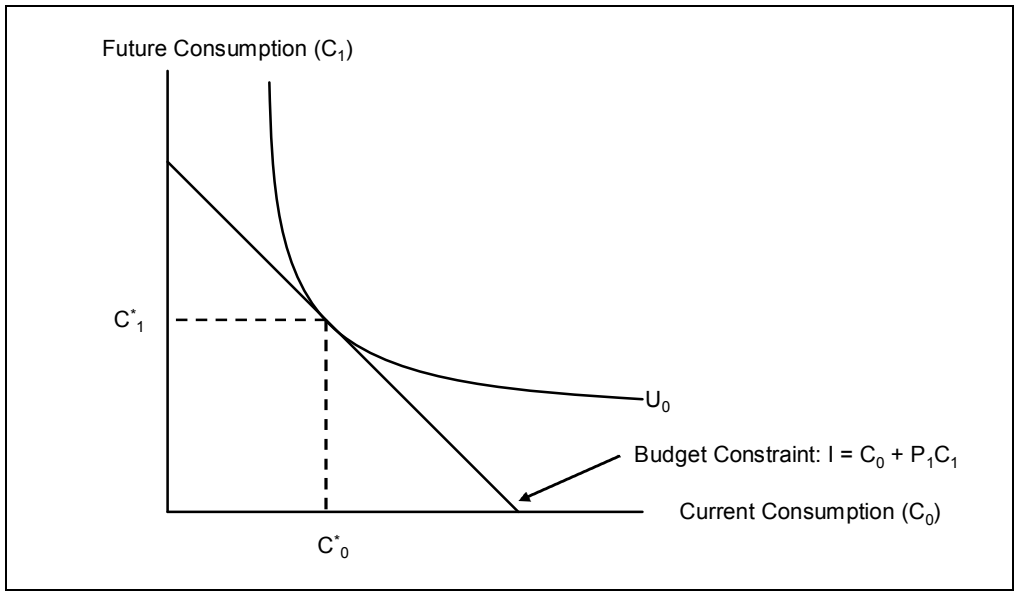

Figure 1. Inter-temporal Utility Maximization

The key implications from this simple two-period framework are:

1. The ratio of marginal utilities over consumption in the two periods determines the choice of savings and investment.
2. The rate of return, *r*, is a key determining factor in the choice of consumption or savings.

Logic Behind Borrowing

It is straight forward to adapt the model above to the situation of a consumer who would prefer to borrow. Very low income individuals face a budget constraint so tight that C_0 is inadequate for sustaining a healthy life. In this instance, demand for loanable funds exists to allow the budget constraint to be relaxed. For simplicity, consider an individual whose current consumption is equal to income. Saving and investment for this individual is zero, unless they borrow. If the individual borrows an amount B, then we can write the new budget constraint as:

$$I + B = C_o + C_1 / (1 + r_t) - (1 + r_b)B / (1 + r_t) \qquad (6)$$

where r_b is the cost of borrowed capital and r_t is the individual's discount factor, which takes into account the individual's risk aversion or intertemporal impatience.

A common source of the demand for loanable funds is entrepreneurs wanting to take advantage of business opportunities. Consider a situation in which investment opportunities are too costly to be financed out of current income. That is, $I - C_0$ for an individual is small. The borrowed funds B are spent on a risky investment project which yields returns at a rate r_I. The utility maximizer can attain a higher indifference curve (u_1) when borrowing to invest in opportunities that allow higher future consumption. When the investment outcome is successful, lenders receive the borrowed principal (B) plus interest (at the prior agreed rate, r_b). The investor has greater consumption possibilities in the future, as seen by the outward shift of the vertical intercept in the budget line (figure 2).

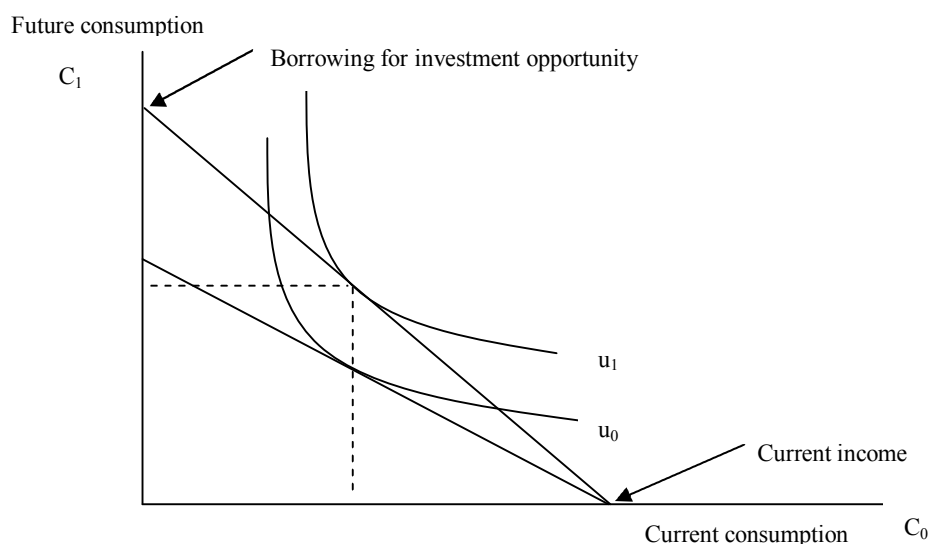

Figure 2. Inter-temporal Utility Maximization with Borrowing

It is clear from the equation for the budget constraint with borrowing (equation 6) that the expected return on investment must equal or exceed the cost of borrowed funds r_b in order for a rational individual to borrow.

The borrower faces the prospect that the risky project will not succeed, in which case the payoff structure takes the form of an option. Borrowed funds B are not repaid, and C_1 is limited to the amount saved. The borrower's payoff is represented by an asymmetric function, which illustrates the incentive to default. Figure 3 illustrates the borrower's option to default. The total value of the investment in period 2 is R. Because the project is a risky venture, outcomes for R can be anywhere along the horizontal axis, from worthless to a large amount. When R is resolved at a large value, the borrower has an incentive to repay the loan plus interest and gains positive payoff of the project value R above the debt repayment. When R is small, or when 0, the borrower has the incentive to default. The borrower's payoff is a call option, or opportunity to reduce losses to 0 through defaulting on debt B.

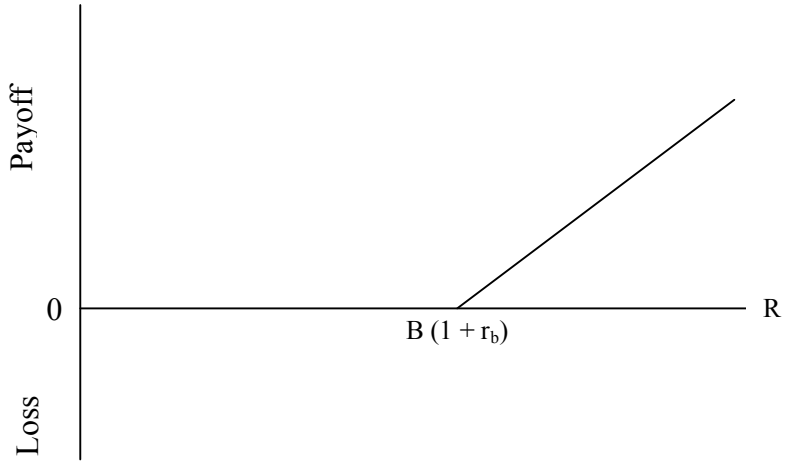

Figure 3. Borrower's payoff structure with default option

Ignoring all social or institutional pressures for the moment, the payoff to a borrower can be represented in monetary terms as:

$$\max [0, R - B(1 + r_b)] ,$$

where R is the total value of the investment in period 2.

The lender's position given the default option for the borrower above can also be diagramed as shown in figure 4.

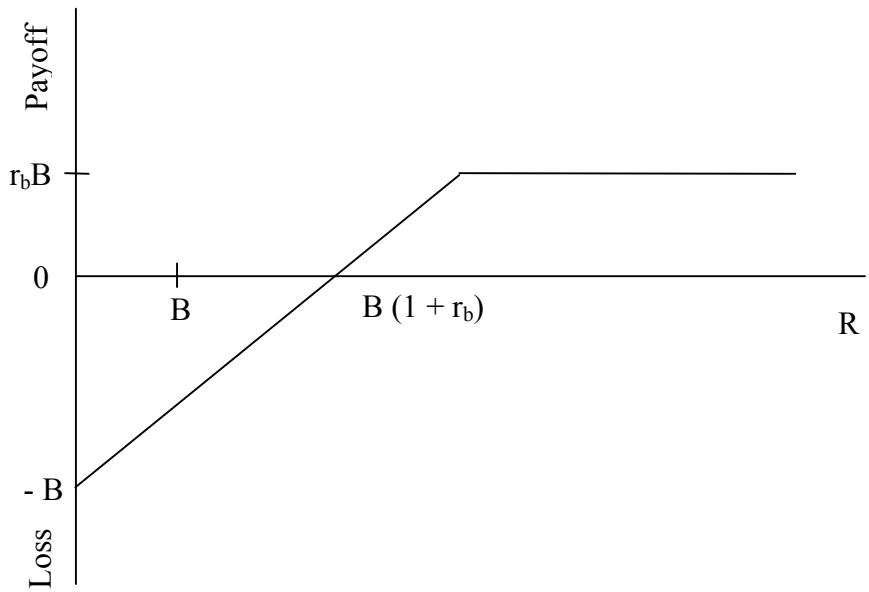

Figure 4. Lender's payoff structure with default option

The payoff structure to the lender is thus presented in the form of a put option. The debt contract gives the borrower the right to sell the project to the lender for the borrowed amount B, should outcomes be poor. The lender, as the seller of the put option, does not have a choice. From the lender's perspective, the payoff R_l can be represented as:

$$- B \leq R_l \leq r_bB.$$

These incentives illustrate the difficulties that risk creates for efficient functioning of credit markets. Institutions have developed to ameliorate some risks in credit provision. For example, contract terms exist in credit markets to mitigate this clear incentive for borrowers to default. These contract terms include:

(i) *Peer selection*: The social pressure exerted by peers bound by group lending contracts which entail joint liability for the borrowers helps to mitigate the incentive to default. Because borrowers have better information about each other, joint liability will lead to the grouping of similar types. Morduch shows that by appropriately setting the interest rate and joint liability payment, a group lending contract can provide a way for the bank to price discriminate and improve repayment rates.

(ii) *Peer monitoring*: Another aspect of group lending contracts is that borrowers have an incentive to monitor the investment of their peers, leading all borrowers in a group to choose the less risky investments and thus reduce the probability of default. This in turn enables the bank to lower the interest rates, raising the expected utility of the borrower's investment projects. In a way, group lending leads to a win-win scenario for the lender and borrower as a result of peer monitoring with an attendant reduction in moral hazard and monitoring costs for the bank.

(iii) *Dynamic Incentives*: Through the establishment of lender-borrower relationships spanning long term horizons, the promise of streams of increasingly larger loans and the threat to cut off lending when loans are not repaid, dynamic incentives are exploited by microfinance institutions as a mechanism reducing the borrowers' incentives to default. Although the power of this mechanism can be reduced by competition among microfinance institutions and the availability of

alternative sources of credit for the borrowers, it has the advantage of testing borrowers with smaller loans before they can access larger ones, thus limiting potential losses due to moral hazard.

(iv) *Regular repayment schedules*: Frequent regular loan repayment schedules, such as weekly repayments, enable the lender to detect defaulting borrowers early and take corrective actions before the situation worsens. For microfinance institutions focused on lending for seasonal agricultural production, however, this mechanism cannot usually be employed due to the nature of the income streams from these projects.

Credit Rationing

More in-depth analysis of the incentive issues that occur in the market for borrowed funds has shown that credit markets are an instance in which the pricing mechanism – interest rates – cannot efficiently allocate funds. Stiglitz and Weiss (1981) show that even in equilibrium, the loanable funds market may be characterized by credit rationing. They provide a model for explaining credit rationing that is different from the traditional 'price stickiness' theory.

Formally, credit rationing is defined as the circumstance when, among loan applicants who appear identical, some receive a loan while others do not; and the rejected applicants do not receive a loan even if they offer to pay higher interest rates. "Criterion *a* rationing occurs when, among observationally identical borrowers, some get loans and others do not, and the rationed borrowers cannot get credit at any interest rate. A second type of credit rationing (criterion *b* rationing) occurs when entire types cannot get credit

at any interest rate, although they would get credit if the supply of funds were sufficiently large. This type of rationing is often termed "redlining" (Stiglitz and Weiss 1987).

Due to information asymmetry, the interest rate that a bank charges its customers affects the riskiness of its loans in two ways. First, there is an adverse selection effect as the bank sorts its potential borrowers. Secondly, there is an incentive effect as the interest rate affects the borrowers' choice of investment projects. That is, the higher the interest rate, the more preferable riskier projects become to borrowers. Consequently, as the interest rate increases, more risk averse borrowers do not borrow as their projects become infeasible, leaving only the risky borrowers in the market. As a result of this risk-increasing effect of interest expense which decreases their expected returns, and the sorting effect (adverse selection), the bank does not respond to excess demand by adjusting their prices. Rather, banks have an incentive to ration credit. There is a concave relationship between the bank's expected returns and the interest rate charged (figure 5). Note that there is no incentive for the bank to lend at interest rates greater than r*. Thus, even if demand increases, lenders do not respond to higher demand by adjusting their prices. The risk-increasing effect of interest expense and the screening effect of high interest rates give rise to credit rationing.

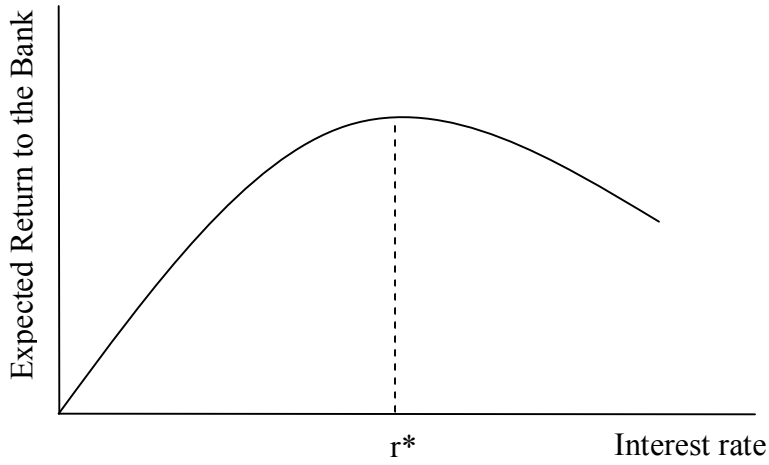

Figure 5. Critical Interest Rate that Maximizes Return to the Bank

Source: Stiglitz and Weiss (1981)

When lenders require collateral, some problems in the credit market may be alleviated because the lender's expected return is increased by the collateral asset. The borrower's payoff structure changes as well, to

$$\pi(R, r_b) = \max\left[R - (1 + r_b)B;\ -C\right]. \qquad (7)$$

The entrepreneur has two possible outcomes from this venture. First, if successful, the project will pay off returns R, hence the borrower receives R less principal and interest repaid at rate r_b, on the borrowed amount B. Alternatively, the project is a failure and the borrower defaults, losing the collateral pledged (C).

Innovations in loan contracts, in monitoring approaches, and in programs that manage the riskiness of projects are potential solutions to the credit rationing problem. As will be shown, there are features of microfinance institutions in Zambia and abroad that illustrate these loan contract innovations. Before presentation of the lending program, background on the Zambian economy is presented.

Zambia Economic Environment

Zambia is a landlocked Southern African country in with a land area of 752,600 square kilometers (290,580 square miles) and a population of 12 million. The country shares borders with the Democratic Republic of Congo (DRC) and Tanzania in the north; Malawi in the east; Mozambique in the south east; Zimbabwe and Botswana in the south; Namibia in the south west and Angola in the west. About 51% of the population lives in urban areas. The majority of the population (64%) lives on less than $1 a day while 72% of the rural population lives below the national poverty line.

Since the 1920s, Zambia's economic development has been spurred by copper and cobalt mining. Agriculture also plays an important role on the country's economy, with more than 70% of the rural population dependent on agricultural production. Between 2000 and 2005, the GDP share of agriculture, forestry and fisheries has averaged 20.5% at current prices (table 2).

Following independence from Britain in 1964, Zambia adopted economic policies that were based on monopolistic public institutions characterized by heavy government involvement in input, output and credit markets. The government simultaneously implemented foreign exchange and import controls. These policies bred inefficient public institutions that weighed down heavily on the government. Furthermore, rising oil prices in the 1970s and 1980s, declining copper prices in the 1980s, high inflation, and severe droughts compounded the fiscal drain on national revenue and led to rising poverty levels. The country's failure to make positive policy changes in response to the declining economic environment further worsened the situation (IMF 2002). The country increased its foreign borrowing to minimize the decline in living standards. During this time, the

country recognized the need to reduce the over-dependency on mining exports and sought policies to broaden the economic base. The preferred strategy emphasized import substitution with little attention on building export capacity (IMF 2002). The result was a failed diversification strategy that did not help the already high unemployment and poverty levels.

In 1991, the country changed its political system from a one party participatory system to multi-party democracy. Since then, the new government has embarked on policies that are aimed at putting the economy on a sustainable growth path and attaining macroeconomic stability. Between 1992 and 1995, the country formally adopted a fast-paced structural adjustment programme (SAP) to stabilize the economy and restore economic growth. The programme consisted of market-oriented reforms and privatization of government-owned enterprises. To date, the Zambia Privatization Agency has privatized 92% of the companies out of a working portfolio of 284 parastatal companies (ZPA 2007). Although this ambitious programme has put the country on course to economic recovery, it has not been without challenges. By 1998, the country's foreign debt burden had reached a staggering $7.1 billion compared to a GDP of $8.3 billion in the same year (representing 85% of GDP). By 2004, Zambia was determined to be eligible for debt relief under the Highly Indebted Poor Countries (HIPC) Initiative. Following Zambia's attainment of the HIPC completion point in 2005, a number of the country's G8 and non-G8 bilateral lenders cancelled all or part of her debt. As of 2006, the country's external debt had declined to $502 million. Per capita GDP has risen from $307 in 1999 to $943 in 2006 (UNDP 2006).

Agriculture

Only 15% of Zambia's 60 million hectares of arable land is currently under cultivation. Agriculture has gained in importance to the overall GDP from 19.9% to 21% over the 2000 – 2005 period, a 5.5% increase (CSO 2005b). Table 1 shows the industry share of GDP by primary sector between 2000 and 2005.

Table 1. Percent Industry share of GDP in Zambia, by Primary Sector, 2000 – 2005 at current prices

Sector	% Share of GDP					
	2000	**2001**	**2002**	**2003**	**2004**	**2005**
Agriculture, forestry and fisheries	19.9	19.7	20.0	20.7	21.4	21.0
Mining and quarrying	4.1	4.0	3.5	2.8	3.1	2.9
Manufacturing	10.2	9.8	10.4	10.9	10.9	10.6
Electricity, gas and water	3.3	3.4	3.0	2.9	2.7	2.8
Construction	5.0	5.5	6.6	7.8	9.2	11.3
Financial Institutions & Insurance	9.8	9.4	9.2	9.0	8.8	8.5
Other (primarily retail and wholesale trade)	57.2	48.2	47.3	45.9	43.9	42.9

Source: Central Statistics Office (CSO), Lusaka, 2005

In the Poverty Reduction Strategy Program (PRSP) adopted by the government in 2002, agriculture was given the highest priority for diversifying production, stimulating exports, creating employment, increasing incomes and improving food security (IMF 2002). This emphasis was appropriate given the large unexploited arable land and the large population of rural and urban poor who earn their livelihood from small-scale agricultural production. Against the poor performance of the mining sector and the urgent need to diversify the economy, commercial agriculture and agro-processing were also envisaged to play an important role in the strategy. The National Agricultural Policy (NAP) and the Agriculture Commercialization Programme (ACP) were developed within the framework of the PRSP to promote an efficient, competitive and sustainable agricultural sector in order to achieve agricultural growth. The five priority areas of the

ACP were: (i) marketing, trade and agribusiness promotion; (ii) agricultural finance and investment; (iii) agricultural infrastructure and land development; (iv) technology development and dissemination; and (v) sector management and coordination.

The Dairy Sub-Sector

Dairy is one sub-sector that has great potential for development and growth in Zambian agriculture. Zambia is a net milk importer, with the country only able to meet about 75 percent of its 253 million liters annual milk requirement. About 70 to 80 percent of all milk consumed in Zambia is sold directly to consumers in local, open markets while the remaining 20 to 30 percent is processed by the commercial dairy processing industry (Mukumbuta and Sherchand 2006). An increase in the number of dairy processors is changing this situation, leading to significant product differentiation resulting in increase in demand for fresh milk.

Over 90 percent of cattle in Zambia are owned by traditional small-scale cattle producers who are mainly beef producers and milk production is largely a by-product of beef cattle production. Milk production efficiency is therefore very low, averaging 2 liters per cow per day compared to an average of 20 liters per cow per day among specialized dairy farmers. Animal health and nutrition issues do not receive significant attention by the smallholders even though cattle production is a symbol of wealth among these communities. Cattle feeding is primarily by open pasture grazing practices rather than provision of fodder, hay and feed supplements. Due to heavy or total dependence on natural pastures whose availability fluctuates significantly with different seasons, milk production in the dry season among small-scale producers is very low. The smallholders also generally tend to sell only surplus milk. As a result, volumes are usually too low to

allow them access to better formal sector markets (Mukumbuta and Sherchand 2006). The regulatory framework for management of the dairy sector and enforcement of public health guidelines to ensure food safety in smallholder milk marketing also remain weak. This weakness has disadvantaged smallholder milk producers because milk processors are not provided quality guarantees and are usually unwilling to buy milk supplied by the smallholders.

Dairy processors have also concentrated on urban areas where the demand for milk and dairy products is high and infrastructure for efficient management of cold chains available. The location of these processors in urban centers means high transportation costs for the rural milk producers making such markets further inaccessible and unprofitable with low volumes.

A 2001 effort by USAID to stimulate growth in Zambia's smallholder dairy sector through the ZATAC project made significant inroads towards achieving this goal. As a result of that effort, 10 smallholders-owned and -operated milk collection centers were established and engaged about 1,000 smallholder producers who marketed 2 million liters of milk through formal channels within the first two years. Today, there are a total of 17 such milk collection centers established through , with additional development funds from CARE International, the Swedish International Development Agency (SIDA) and the Government of Zambia (Mukumbuta and Sherchand 2006).

ZATAC has, in partnership with these institutions, financed the development of the smallholder dairy sector with some of the most significant projects being:

(i) Establishment of smallholder owned- and -operated milk collection centers to collect and market small-scale dairy producers' milk, ensure high standards of

milk quality and create milk quality assurance systems in conformity with the high standards required by milk processors and consumers. Some milk collection centers have already made plans to begin dairy processing themselves.

(ii) Increased access to pure dairy breed cows by smallholders enabling them to increase their milk production and marketing, and raise incomes significantly. Many smallholders are now able to market an average of 30 liters of milk daily from previous averages of less than 4 liters a day, realizing gross annual incomes of about $4,100 from two dairy cows for each producer.

(iii) Establishment of efficient cold chain milk transportation channels either owned by single cooperatives or joint cooperative milk transportation ventures. As a result, smallholder dairy producers have increased access to better markets.

(iv) Increased access to artificial insemination and veterinary services by dairy farmers, enabling them to improve animal health, increase their herds and consequently increase their incomes.

(v) Establishment of zero grazing schemes that have enabled small-scale dairy producers to significantly increase milk productivity.

The Financial Environment and Access to Credit

The banking industry in Zambia is composed of the Bank of Zambia, which is the central bank responsible for overall regulation of the banking industry and for setting national monetary policy, and 13 commercial banks. These banks include 8 foreign owned (including one that was recently privatized by the Zambian government); 4 owned by

local private investors, and 1 jointly owned by the Zambian Government and the Indian Government (BOZ 2007). Non-bank Financial Institutions (NFIs) include 1 development bank, 1 savings and credit bank, 3 building societies (mortgage companies), 3 micro-finance institutions, 9 leasing companies and 32 bureaux de change. NFIs are regulated and supervised by the Bank of Zambia under the Banking and Financial Services Act of 2000. There is one exchange: the Lusaka Stock Exchange, established as a modern securities exchange in 1993 as part of the government's economic reform program aimed at developing the financial and capital market in order to enhance private sector investment (BOZ 2007).

Despite the existence of these financial institutions, agricultural businesses have limited access to credit. More than 90% of rural farmers in Zambia hold no title deeds to their farming land. Consequently the average Zambian farmer has little or no access to loanable funds for commercial farming, as the major lending institutions are generally unwilling to extend loans for investment on land without title. Further, without title deeds, the farmers are unable to use their land as collateral for agricultural credit. Given this scenario, the role of microfinance institutions in ensuring smallholder producers' access to investment and working capital financing has been identified and supported by government and the private sector. Small loans have also been provided by outgrower schemes, especially for cotton, paprika, fresh vegetable and tobacco production. An outgrower scheme is a contract farming scheme involving the provision of inputs such as seed, fertilizer, chemicals or equipment, on credit by a lender (usually an agricultural processor) to small-scale farmers with a contract that the lender will buy all the produce

and recover the loans from the farmers' sales. Outgrower schemes in Zambia are unregulated.

Since the early 1960s, government-initiated credit programs were undertaken, all of which failed, some after recording short-lived successes. Other programs stayed longer possibly only due to government subsidies. As these subsidized programs weighed down heavily on the government, they could not be sustained for long. However, very little research has been undertaken to understand the particular characteristics that led to the failure of all these efforts. Copestake (1998) describes the Agricultural Credit Management Program (ACMP) that was launched by the government in 1994 with the goal of promoting a private sector network for delivery of credit in line with the government policy to de-subsidize credit. Copestake concludes that despite being consistent with the credit de-subsidization commitment, the ACMP was not effective in promoting business development, largely because the lending institutions still viewed agricultural lending as unprofitable and risky and therefore did not support it.

In another study that relates more to the commercial banking system, Maimbo (2002) finds that the Zambian central bank's model to detect deterioration of credit was adequate, however, many managerial and financial, i.e. credit, risks remained in the banking system. While the conclusions of Maimbo relate to commercial banking, the importance of capital management ability and lender-borrower interactions are generalizable to all lenders.

Demand for loanable funds by small-scale farmers is high in Zambia, and currently unmet by the existing lending institutions providing credit to this category of borrowers. Some microfinance institutions concentrate on consumer credit and are

therefore inaccessible for agricultural production purposes. Most outgrower schemes are also operated as short term projects by donor funded non-governmental organizations (NGOs). Although a good source of small credit, the short-term nature of these schemes has been a limiting factor. Moreover, the loans, averaging less than $600, are often too small to enhance meaningful investments in agricultural production, agro-processing and related projects.

The foregoing inadequacies of the credit environment in stimulating the growth of smallholder agriculture in line with the PRSP led to the establishment of ZATAC Ltd. in 2002. ZATAC Ltd. is a Zambian company that was incorporated as a private non-profit institution following the successful turn-around of the country's smallholder dairy subsector in Kazungula district in 2001.

The ZATAC Approach

The ZATAC Investment Fund (ZIF) was established with the strategic aim of helping to commercialize smallholder production through increased access to credit. As a way of sustaining the activities started under the project, ZATAC Ltd. was registered as a non-profit company in 2002. In August 2004, the ZIF had a small loan portfolio of about $320,000. Since then, the ZIF has attracted a number of funding agencies that have channeled loan funds for specific development financing needs through it. As of March 2007, ZIF had a total loan outstanding amount of about $2,500,000. Of this portfolio, 57.5% is in loans to institutional borrowers (usually agro-processors and exporters that provide a primary market to the smallholder producer groups) with the remaining 42.5% in loans to small-scale farmers organized in cooperatives. Thus the current microfinance portfolio at ZATAC is $1,060,000. About 64% of the loans to the cooperatives are further

loaned by the cooperatives to their individual members, usually 25 – 30 members per cooperative. The remaining 36% is composed of medium to long term infrastructure development loans, such as buildings and equipment.

The ZATAC technical approach for commercializing smallholder production involves five phases. The first phase involves evaluating the commercial potential for smallholder production to help smallholders transition from subsistence production to cash-earning production and value-addition to maximize returns to labor and investment. The second phase involves identifying and mobilizing producer communities resulting in the development/strengthening of formal business groups and cooperatives. Phase three involves the training of producer groups/cooperative members, usually provided in three tracks: (a) technical skills focusing on animal husbandry, crop production, quality control, (b) business and management skills, including farm budgeting, book-keeping, financial management, markets and marketing, and (c) organizational development/cooperative governance to help raise collective consciousness by pooling resources and building solidarity. In phase four, credit is provided to the smallholder producers through their cooperatives. The loans are in three forms: (a) short term (3 – 6 month) working capital, trade finance and seasonal loans; (b) medium term (1 – 3 year) loans usually for capital investments, such as purchase of dairy cows; and (c) long term (3 – 10 year) loans mainly for plant and equipment. Phase four is accomplished through the ZATAC Investment Fund. The final phase, which runs concurrently with phases one through four, involves building long term relationships between ZATAC and the smallholder producer institutions.

ZATAC lends to rural small-scale producers in organized groups, usually cooperatives and to registered agribusiness companies, especially those that provide markets for rural small-scale farmers. ZATAC does not provide consumer loans. No loans are provided to individuals without a specific viable business plan. The table below summarizes the lending criteria followed by ZATAC and terms of the loans.

Table 2: ZATAC Typical Loan Terms

Criteria	*Applicable Terms*
Interest Rates	LIBOR[1] rate plus 4% margin on dollar-denominated loans. Prevailing inflation rate[2] (adjusted bi-annually) plus 2 - 3% margin for Kwacha-denominated loans.
Service/Facility Fees	3.5% on dollar-denominated loans. 5% on Kwacha-denominated loans.
Loan Term	3 – 6 months: working capital, trade finance, seasonal loans. 1 – 3 years: medium term capital loans (e.g. dairy restocking). 3 – 10 years: long-term investment loans (plant and equipment).
Repayment schedule	Flexible (ranging from monthly to lump-sum payable at maturity).
Collateral	Flexible (usually does not require collateral from rural groups).
Group lending	Joint liability through cooperatives (rural and peri-urban), which in turn lend to individual members.

[1]As of March 2007, 6-month dollar LIBOR rate was about 5.32%.
[2]As of March 2007, inflation rate was 15.9%.

ZATAC bids for implementation of various agricultural development projects. Where such projects have loan funds available, ZATAC uses the ZIF as the vehicle for managing and administering the loans. Although ZATAC is moving towards achieving financial sustainability, that goal has not yet been attained. Usually the fund management agreements with the funding agencies provide for an eventual permanent transfer of the loan funds to the ZIF.

Each funding agency has specific target groups or sectors, such as dairy, coffee, paprika/spices, fresh vegetables for export, etc. However, ZATAC also makes available loans to advance any agricultural-oriented profitable business including production, processing, packaging, marketing and/or export financing.

The purpose and activities of ZATAC's microfinance programs demonstrate a commitment to agricultural sector financing needs. In order to understand the prospects for sustainability of ZATAC, a comparison of its programs with the notable successes of microfinance programs worldwide will be presented in the next section.

Comparison of ZATAC Microfinance Programs with Global Institutions

Comparisons of ZATAC with other microfinance institutions were based on Morduch's synthesis of five key mechanisms employed by major microfinance institutions he surveyed. We are not able to determine whether all five key mechanisms (peer selection, peer monitoring, dynamic incentives, regular repayment schedules and the use of collateral substitutes) are necessary tools for mitigating credit risk in the microfinance institutions, or to what extent they are causally related to repayment rates.

Peer selection and peer monitoring were combined into one mechanism, group lending, since the initial two mechanisms may not be easily observable in the wake of information asymmetries. Data collected at the ZIF office, coupled with interviews with key staff in the office, are used to determine whether or not group lending, dynamic incentives, regular repayment schedules and collateral substitutes are used, and to what extent. Comparisons of the characteristics of some selected microfinance programs and ZATAC are shown in table 4.

Table 4. Characteristics of Selected Microfinance Programs

	ZATAC, Zambia	Grameen Bank, Bangladesh	Banco-Sol, Bolivia	Bank Rakyat Indonesia, *Unit Desa*	Badan Credit Desa, Indonesia	FINCA Village banks
Membership	655 in 22 coops[1].	2.4 million	8,503	2 million borrowers, 16 million depositors	765, 586	89,986
Average loan balance	$1,624 for coops, $90,872 for institutional borrowers	$134	$909	$1007	$71	$191
Typical loan term	3 months – 10 years	1 year	4-12 months	3-24 months	3 months	4 months
Percent female members	26%	95%	61%	–	23%	95%
Mostly rural? Urban?	Mostly rural	Rural	Urban	Mostly rural	Rural	Mostly rural
Group lending contracts?	Both group & individual	Yes	Yes	No	No	No
Collateral required?	Yes, except for coops	No	No	Yes	No	No
Voluntary savings emphasized?	Yes, in their own bank accounts	No	Yes	Yes	No	Yes
Progressive lending?	Yes	Yes	Yes	Yes	Yes	Yes
Regular repayment schedules?	Flexible	Weekly	Flexible	Flexible	Flexible	Weekly
Target clients for lending?	Largely poor	Poor	Largely non-poor	Non-poor	Poor	Poor
Currently financially sustainable?	No	Yes	Yes	Yes	No	No
Nominal interest rate (on loans per year)	9.5 – 12% ($ loans) 20.9% (ZMK loans)	20%	47.5 – 50.5%	32 – 43%	55%	36 – 48%
Annual consumer price inflation	15.9%	2.7%	12.4%	8.0%	8.0%	–
Real interest rate	5 – 9%	17.3%	35.1 – 38.1%	24 – 31%	47%	–

[1] ZATAC is not membership based; the figure shows the number of cooperative members borrowing through their respective cooperatives.
Source: Morduch, 1999; except ZATAC figures which are based on data from ZIF office.

The comparison of ZATAC with other microfinance institutions reveal that there are common features employed by these institutions. The common features include:

1. *Group lending*: ZATAC uses group lending by offering credit to rural small-scale agricultural producers through cooperatives. The members of a cooperative are

held to a joint liability contract signed with ZATAC through the cooperative, thus conferring the benefits of peer monitoring to the lender. An adaptation of group lending here is that ZATAC requires that each cooperative signs additional sub-loan contracts with their respective members, which give the cooperative monitoring power and authority to impose stiff sanctions or completely cut off defaulting borrowers. A further adaptation made by ZATAC to the peer selection process of group lending is that ZATAC's loan officers assess the credibility of each cooperative's selection process by visiting all selected members, focusing on their potential to profitably produce the commodity chosen and any characteristics that could affect their ability to do so. The results of these assessments are shared with all members of the cooperative, who may then take into account these findings in selecting loan recipients.

2. *Use of collateral substitutes for cooperatives*: Like many microfinance institutions, ZATAC does not usually require explicit collateral from cooperatives for the funds destined to be lent to individual cooperative members. However, ZATAC holds liens on any plant and equipment and dairy animals purchased through its loan funds. In addition, ZATAC requires that all equipment and dairy animals purchased through its loan funds be insured. Due to the cost of insurance, however, ZATAC does not usually emphasize insurance of buildings. Emphasis on pre-contracted markets for the agricultural produce before disbursement of loans to cooperatives also provides some form of insurance allowing for the easing of collateral requirements. ZATAC itself gets actively involved in assisting the cooperatives to strike good commodity market deals.

3. *Progressive lending*: The business development section of ZATAC works with the ZATAC Investment Fund (ZIF) to develop long term relationships with borrower cooperatives. Better performing cooperatives with good repayment rates have the promise of receiving further loans. Subsequent loans are not necessarily larger than the first loan due to the high cost of initial investments required for agricultural production and processing projects. Nevertheless the continued loans are often necessary in the early years of these projects for sustainability of operations and in later years for business expansion.

Differences also exist between the ZATAC model and other microfinance institutions. These include:

1. *Lower real interest rates*: A significant difference between ZATAC and the other microfinance institutions analyzed is that the former offers much lower annual real interest rates, ranging between 5% and 9% compared to a 17.3 – 47% range for the other institutions.
2. *Larger loans provided by ZATAC*: The size of the loans provided by ZATAC is significantly larger than those provided by comparable microfinance institutions. This can be explained by the high investment costs required for agricultural investments to be profitable.
3. *ZATAC is very small*: Compared to the other institutions analyzed in the published literature, ZATAC is much smaller. Partly, the current size is a reflection of the short period ZATAC has been in operation given the initial startup capital that it had. The smaller number of borrowers also enables ZATAC to easily monitor the borrowers and reduce the risk of default.

4. *No deposits*: Unlike all other microfinance institutions analyzed, ZATAC does not take deposits. ZATAC therefore does not use 'forced' deposits mechanisms sometimes employed by other microfinance institutions to improve repayment rates. Borrower cooperatives are, however, required to maintain loan repayment accounts with a commercial bank with which ZATAC has a fund management agreement for purposes of monitoring loan repayment activity.
5. *Automatic repayments tied to production*: This is a mechanism extensively exploited by ZATAC to improve repayments that is not used by other microfinance institutions. Cooperative members are required to sell all contracted produce through the cooperative marketing centers. The cooperatives then deduct loan repayments from the sales of each member, based on production, and directly pay to ZATAC. By publicly displaying charts of both production and loan repayment trends of each member, the cooperative creates a system of peer monitoring which improves production and loan repayments through social pressure. The cooperative leadership can also quickly detect defaulting members and take corrective action as members in good standing try to avoid bearing defaulting members' loan liability. Because payments of sales are made to the members monthly by the cooperative, members have a 'banking' system within their cooperatives and the lump-sum payments enable them to invest in other businesses or expand their current businesses.
6. *Loans disbursed*: Often ZATAC disburses loans in the form of building, equipment and inputs to small-scale farmer cooperatives, based on the cooperatives' project proposals. This ensures borrowed funds are invested in the

intended projects. Loans for a dairy project by a cooperative, for instance, will take the form of direct payments to building contractors, equipment suppliers and dairy cow suppliers and/or insurance companies.

7. *Cooperative sanctions on members*: Cooperatives repossess dairy animals and equipment from members who side-sell their milk. Cooperative sanctions are also administered by cooperatives involved in other production projects such as coffee, fresh vegetables, fish farming and honey.
8. *Organizational and business development services*: ZATAC has a developmental focus, often helping build the organizational and leadership capacity of new borrower cooperatives even before the loans are disbursed. Training is given to all cooperative members to build collective consciousness among members towards resource pooling and collective marketing in order take advantage of economies of scale and lower transaction costs. Identification of new business opportunities for investment by the cooperatives is an integral part of the ZATAC model for smallholder commercialization and dynamic incentives formulation. Business and technical skills training are also given to members of borrower cooperatives. Technical skills include production, quality control and quality assurance systems while business skills range from basic bookkeeping, farm budgeting, markets/marketing to financial management.
9. *Loans to large agribusiness companies*: ZATAC provides a substantial portion of loan funds to larger and more established agribusinesses, especially agro-processors and exporters, who provide markets and sometimes other additional services to smallholder cooperatives. Common uses of such loan funds by the

agribusinesses include commodity purchases for processing, export transaction costs and other trade finance requirements. This way, new and growing cooperatives can tap into the capacity of the larger agribusinesses to process and add-value and get market guarantees for their produce. It works also to improve loan repayment rates for the lender.

Conclusions

While features of the ZATAC Ltd. group lending programs resemble the lending mechanisms of leading microfinance institutions worldwide, more differences than similarities exist. Some of the differences result from seasonal agricultural production and its unique credit needs. Microfinance institutions serving consumer and small business borrowers cannot enforce repayment tied to production through cooperative marketing channels, as ZATAC Ltd. does. Other notable distinctions of ZATAC Ltd. are larger loans and relatively low interest rates. The relationship of loan size and interest rates to default and to sustainability are interesting empirical questions for further study.

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