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Karl Borden kborden@datawedge.com is a Professor of Financial Economics at the University of Nebraska/Kearney.

Abstract

There has not been a single study published that is based, as is this paper, on primary data of the actual interest rate practices of microfinance lending institutions using the Grameen model. Many non-government organizations around the world have built major non-governmental economic platforms with the capital accumulated from Grameen-style

microlending activities. Investigated in this paper is whether Grameen is the extraordinary success that it is widely reported to be.

Data for this study was gathered by following the entire universe of borrowers at a single Grameen banking center in the rural Rajshahi District of Bangladesh over a period of eight years. Developed is a calculation methodology for determining *post hoc* rates of return on Grameen-style lending contracts. Concluded is that lower than expected loan default rates are not the explanation for the accumulation of capital by Grameen and Grameen clones. Instead, it is the charging of effective interest rates that are very high relative to those of traditional lending institutions that produces rates of return sufficient to pay for their substantial loan administrative costs and make possible the accumulation of capital over time. The high effective interest rates also incentivize borrowers to continually increase their indebtedness over time.

Introduction

“Microenterprise Lending” refers to “...the provision of loans, savings accounts and payments services to clients from the poorest third of the populations of less developed countries” (1) The concept of microenterprise lending was pioneered by Professor Muhammed Yunis, winner of the 2007 Nobel Peace Prize, who at that time was an economics instructor at Chitagon University in Bangladesh. Dr. Yunis’ efforts have produced a major financial institution (Grameen) and spawned copycat efforts both throughout Bangladesh and around the world.

Grameen and other microfinance lending institutions (MFIs) claim they charge relatively low interest rates on their loans, but there have been no studies of primary loan data to document actual lending rates. This paper develops a calculation methodology for determining *post hoc* rates of return on Grameen-style lending contracts, and provides primary data and analysis demonstrating the actual, *post hoc* rates of interest being charged by Grameen at a rural lending center in Bangladesh using a 8-year data series derived from primary bank lending and payment records.

Literature Review and Background

Whether success is measured in economic terms by the rate or quantity of capital accumulated, or in human development in terms of the number of people raised from abject poverty to more tolerable living conditions, Grameen is generally counted by the public media and academic literature as an extraordinary success. Other non-government organizations (NGOs) in

Bangladesh and around the world have adopted and variously adapted the Grameen technique, and they have built major non-governmental economic platforms with the capital accumulated from microlending activities. Many, if not most, of these microfinance institutions have copied the Grameen model, possibly because many of their principals were trained by Grameen.

Bangladesh is probably the world leader in non-governmental organizations...most of the foreign money (around \$250m a year) goes to a handful of famous NGOs such as the Grameen Bank, the Bangladesh Rural Advancement Committee (BRAC), Proshika and the Association for Social Advancement. These are among the biggest rural-development organizations in the world, and they have an awesome reach. (2)

Using the most recent publicly-available figures the Grameen bank has published, it has \$724US million in loans outstanding to impoverished clients throughout Bangladesh. Currently, Grameen is the largest rural finance institution in the country, with more than 6.9 million “members” (borrowers), 97 percent of whom are women. With 2,319 branches, Grameen Bank provides services in 74,462 villages. The bank claims a loan repayment rate of over 98.79 percent, with an average loan balance per member of just \$70. (3) BRAC has over 19,000 full-time employees, 34,000 part-time teachers, and 2.3 million members (mostly female) in 66,000 villages, which means it operates in virtually every village in the country. Microenterprise lending appears to be producing an accumulation of substantial amounts of capital, and that capital becomes available to NGO managers to direct in support of economic development activities and pay for their large staffs of development professionals (Grameen reported 25,283 employees in 2007). (3)

In addition, recent years have seen an explosion in commercially-sustained MFIs and the beginnings of securitization of underlying MFI debt instruments. “...The entry of private investors is the most notable change in the microfinance investment marketplace. New players arrive on the scene every month. Forty specialized microfinance investment firms have been established in the past three years alone...”, (18) In spite of this explosion of activity and the ubiquity of the Grameen model--“Most microfinance activity in China and in the poverty-focused “Trust Banks” started by Opportunity International in Eastern Europe either directly follows the lending model of the Grameen Bank or is based on similar concepts.(19, p 3)--there has been not a single published study based on primary data of the actual interest rate practices of MFIs using the Grameen model.

For-profit financial institutions supporting MFI securitization do not publish their underlying asset-value particulars, and both academic and industry sources

routinely quote without question the loan rates stated by MFI's in their self-promotional literature. But in spite of the frequent speculation about what actual lending rates are (20), no studies based on primary lending data exists. Even papers addressing issues such as the recent "sub-prime" financial crisis and its relevance to MFIs speak in generalities about actual MFI loan rates (21), and papers that conduct detailed statistical analyses of MFI loan rates rely uncritically on claimed loan rates by MFI institutions to perform their analyses. (22)

One impediment to the development of primary-data loan studies has been the complexity of the loan contracts themselves. As is explained later in this paper, the Grameen model is a frankly convoluted system of multiple payments, revolving credits, fees, "stock purchases," group fund obligations, and other elements that make actual loan rate analysis a computational challenge. A second impediment has been the physical difficulty of locating and reviewing actual MFI loan records because they are in handwritten form in non-English languages and scripts, often utilizing--certainly in Bangladesh--non-Arabic numerology, and haphazardly stored at remote banking centers in tiny villages, accumulating mold and deteriorating in a humid environment.

Although there are a few interesting organizational wrinkles associated with the Grameen loan award and management process that has become an MFI standard--all of which have been well documented in both the economic and development literature--there is really nothing very startling about the idea that a well-administered loan portfolio with an adequate rate of return relative to risk can accumulate large sums of capital for a lending institution.

Relative to commercial lending organizations, MFIs experience greater-than-average administrative costs due to their large number of very small loans and the need for a high level of customer education and service. These increased costs must be paid for somehow, and the fact that MFIs, after obtaining relatively modest "venture" capitalization (usually from either government or private foundation sources) have consistently accumulated large amounts of capital suggests that they are more than covering those costs.

In development literature, the ability of MFIs to sustain high administrative costs has been explained by purported low loan default rates. Gomez and Santor (23) demonstrate that the group-obligation loan repayment environment does appear to produce lower than expected loan default rates, but Ledgerwood (24, pp 147) confirms that microfinance institutions with loan default rates in excess of 5 percent are not viable institutions due to the higher-than-normal administrative costs of MFIs even as "mature institutions."

A closer look at the Grameen data, however, suggests that their loan default experience is substantially understated and is not the primary explanation

for Grameen's ability to accumulate capital. (4) Phillips reports that Grameen's loan delinquency rate is closer to 19 percent (25), and Bethell observes that "...the bank has often provided new loans to allow borrowers to keep current on old ones." (26) This author's personal experience reviewing primary loan record data at a Grameen rural lending center confirms both the 19 percent estimate and the "roll over" nature of many of the loans technically listed by the bank as current.

Lower than expected loan default rates cannot be the explanation for the accumulation of capital by Grameen and Grameen clones. Rather, it is the hypothesis of this paper that Grameen simply charges effective interest rates that are very high relative to traditional lending institutions. It is their higher effective interest that produces rates of return adequate to pay for their substantial loan administrative costs and allow for the accumulation of capital over time.

Bell, Harper, and Mandivenga, in a study of MFI activity in Kenya and Zimbabwe, conclude that MFIs using a "prime rate cost plus" loan pricing approach in those countries produced loan rates of 64.5 percent per annum, but they provide no calculation methodology and no primary loan data analysis to support the conclusion. (32)

Ledgerwood, in a 1999 World Bank publication providing guidance to MFIs worldwide (24) and in a more comprehensive follow-up--published again by the World Bank in 2006 (33)--is one of the few sources that even attempts to define a specific calculation methodology for MFI interest rates on loans. Even the comprehensive discussion of the economics of MFIs found in works by de Aghion and Morduch, which include detailed data and academic studies on economic sustainability and systemic returns on subsidy, never address the financial economic question of what actual loan rates of interest are being charged, and they certainly never provide actual primary data to support any industry claims. (19, 29, 30, 31)

Ledgerwood's work in particular is very detailed and provides by far the best and most comprehensive operational guidance for MFIs seeking to operate in a financially rational manner. And she bases her work with a commendable reliance on many standard corporate-world financial economic concepts and models, rather than the (all too typical) shoehorning of "developmental economics" notions into a rational economic environment. But in the final analysis, her discussion of actual "effective" lending rates resulting from MFI loan contracts also fails to provide any hard data, or precise analysis, of what those rates actually are.

Ledgerwood defines two broad calculation methods: the “declining balance” method and the “Flat (face-value)” method, the formulas for neither of which conform to any definition of rate found within the financial economic literature. Her “declining balance” method merely quotes step-by-step procedures from a standard financial calculator instruction book, and it is nothing more than a simple Internal rate of return on a loan amortization schedule. Though she does not identify it as such, her “flat (face-value)” method is simply a nominal interest rate applied to an initial loan face value. Neither method even comes close to addressing the complexity of standard MFI loan contracts and repayment methodologies.

To be fair, Ledgerwood does make an attempt to adjust her basic “declining balance” method to account for up-front fees and to calculate an “effective interest rate,” and in that regard she does make a valuable observation consistent with that utilized by this study:

The effective rate of interest refers to the inclusion of all direct financial costs of a loan in one interest rate....Effective interest rates differ from nominal rates of interest by incorporating interest, fees, the interest calculation method, and other loan requirements into the financial cost of the loan. The effective rate should also include the cost of forced savings or group fund contributions by the borrower, because these are financial costs. [24, pp 143]

Setting aside the non-standard usage for terms such as “effective rate,” “nominal rate,” and “financial cost,” Ledgerwood is correct in recognizing that a variety of fees and payments required by Grameen-model MFIs are in fact forms of interest and must be included in the calculation of an effective rate of interest. Unfortunately, she fails to then include in her formulae any mechanism to incorporate such fees and payments in a mathematically precise fashion. She simply notates “Amount paid in interest and fees / Average principal amount outstanding,” and observes that “To calculate the effective cost per period, simply divide the resulting figure by the number of periods.” [24, pp 144].

Using these calculation methodologies, she derives an estimated “effective interest rate” for a 20 percent “nominal rate” with a 3 percent loan initiation fee as 25 percent if calculated using her “declining balance” method, or 42 percent using her “flat” method. She then attempts the use of an “internal rate of return” calculation that incorporates up to 6 different variables, including group fees, up-front interest payments, loan service fees, and compulsory savings for 4-month and 6-month term loans. Her resulting “effective rates” vary from a low of 36 percent to a high of 59.3 percent, depending on the variables included.

She also, in a subsequent section, attempts to turn her perspective around and calculate an “annualized effective yield” for the MFI, but her methodology suffers from similar errors of over simplification.

Data Collection and Analysis Methodology

The Grameen lending model explained in detail below involves a complex series of payments and fees coupled with interlocking and roll-over loan provisions that make a correct mathematical analysis of *post hoc* loan rates dependent on following specific borrowers over an extended period of time. In other words, because loan agreements are interlocking and rolled over from contract to contract, one must analyze effective rates on borrowing by following a specific *borrower* over a series of loan agreements over time. Simply looking at the stated rate on a specific loan, or at any one loan, will not yield the actual rate being charged a specific borrower.

Data for this study was gathered by following the entire universe of borrowers at a single Grameen banking center in rural Rajberry District over a period of eight years. The center was chosen because it had been existence for a full eight year period. With Grameen’s explosion in activity over the past 20 years, many centers did not have a full eight year history. In addition, it had retained individual borrower records – something most Grameen lending centers had not done.

Rather than relying on the aggregated data compiled and reported by Grameen, the borrowing and payment record of each individual borrower at the banking center was examined by reviewing the hand-written payment booklets maintained by the center and stored in cardboard boxes in a thatch-roofed attic. The resulting data and analysis is thus not a statistical sample, but represents the entire universe of borrowers at a single village banking center.

In order to calculate an effective *post hoc* lending rate, a calculation paradigm had to be developed based on the lending contract and fee schedule employed by Grameen over the eight-year period studied. Because the Grameen model depends so heavily on interlocking and roll-over loan contracts, effective costs of borrowing vary considerably depending on whether the borrower maintains stable loan balances or increasing loan balances over time. It is primarily for that reason, combined with the array of “fees” and “stock purchases” required of borrowers, that stated, nominal interest charges claimed by Grameen differ so substantially from those identified in this study. For that reason, developed below are effective interest rates for a ten-year stable loan portfolio, a ten-year sample increasing loan balance portfolio, and then the actual seven-

year total-Center loan portfolio data studied (seven years' payment history spans eight calendar years).

Ledgerwood's attempt to develop a mathematical paradigm to measure effective loan rates for MFIs is commendable, and she clearly understands that calculating the effective interest rate charged by Grameen and other MFIs using the Grameen model is complicated by the unusual nature of the economic "contract" between Grameen and its borrowers. In order to understand the unique nature of this contract, it is necessary to explain something of the lending procedure utilized by Grameen. It is not the purpose of this paper to detail the Grameen loan administration process, which has been well documented in MFI literature. But if we are to extend Ledgerwood's work to develop a more precise mathematical model, it is important to understand the dynamics of the loan administration process.

Grameen operates through a series of bank "Centers" located in villages throughout the country. Each "Center" is comprised of (usually, ideally) 40 borrowers, who are in turn organized into 8 "groups" of five borrowers. "Centers" hold weekly meetings with their loan officer, during which each "Group" makes its interest payments on their loans directly and very publicly to the loan officer. Each Group has an elected "Group Leader" who collects the payments prior to the Center meeting and hands the payments to the Loan Officer.

When a new borrower joins a Center, she must be a part of a group. No independent borrowers are accepted. The group is expected to support each other's business activities and exert social pressure on its own members to make their interest and principal payments.

Each week, each member must, in addition to their loan payments, make regular payments into a "Group Fund Account". Ledgerwood correctly identifies these payments as part of the cost of obtaining MFI credit. What complicates matters, however, is that those payments, in the amount of Taka (Tk.) 5 each week, accumulate as bank balances.

In the early years of Grameen lending (until 1998), Group Fund Account books (small hand-held records of group deposits) reflected only the Group Fund total balance, not individual balances, though those balances were maintained by the Branch Office bank records, emphasizing that the Group maintained control over and responsibility for the Group Fund Account. In ,1998 new Group Fund Account books were issued that do show individual fund balances, but the mathematical effect of the Fund balances remained the same. (This study's eight-year period spans years before and after 1998).

These Group Fund Account balances (up to 50 percent of the account balance of any individual borrower) are available to the Group to lend out to Group members who have short-term financial needs, and in one sense they serve as a form of portfolio insurance, helping group members past short-term financial problems and in the long term improving loan portfolio performance (23). But, except in the cases of a “Group Fund Emergency Loan,” which is made without interest, the Group Fund Account (GFA) is unavailable to borrowers until they have completed ten years of successfully-repaid loans. (7) GFAs, then, are effectively a compensating balance requirement that serve to increase the effective interest rate that borrowers are paying. Group Fund Accounts earn interest at the rate of 8.5 percent per year, paid semiannually on the average monthly balance over the past 6 months.

Another complicating factor is the series of fees charged new borrowers at the initiation of their loan. All new borrowers must pay Tk. 35 to participate in a “training session” conducted by bank loan officers (Ledgerwood includes an up-front fee in the form of “interest points,” but not a mechanism to incorporate a flat fee). The efficacy of the training session as a means of improving loan performance notwithstanding, that Tk 35 fee is effectively a loan initiation fee and must be deducted from the initial loan balance to derive an effective lending rate (Ledgerwood incorrectly adds the fee as a payment rather than deducting the payment from the available loan balance).

Likewise, the Tk. 100 charge for a “share of stock” in the Grameen Bank must also be considered a form of loan initiation fee. The “stock” cannot be sold or otherwise traded except back to the bank at the time of a lender withdrawing from further participation in bank lending activities. It earns no interest and only recently (in 2007) were any “dividends” paid on the “investment.” (8) Regardless of what it is called, this Tk. 100 payment is simply an additional loan initiation fee. Calculation of the effect of these loan fees is further complicated by the fact that they are generally deducted from GFA fund balances when the fund reaches a level sufficient for the payment.

That the GFAs are a significant factor in determining the effective interest rates being charged by Grameen becomes evident from the relative size of GFA balances and loan disbursements. In 1998, Grameen disbursed a total of Tk. 33,275,500 for all loans. At the end of 1998, total GFA balances amounted to Tk. 12,649,000, or 38 percent of total loan disbursements. (9) In other words, 38 percent of the money “loaned” out to Grameen borrowers was actually their own funds held captive in savings accounts to which they as individuals have no access. (10)

The loan repayment process is itself a complex system that is unique to Grameen (and Grameen clones) and further complicates the calculation of an effective interest rate. That payment process was recast in July, 1998, and the change in payment procedures had a dramatic impact on loan recovery rates and the effective interest rate charged. Because the study period spans years both before and after the change in loan contract terms, loan payments are analyzed using both systems to show the impact of the change in loan interest and payment methodology: the original, or “old” system employed by Grameen until 1998 and the “new” system employed for the past 11 years. Although Grameen itself has moved to a new set of contract terms, many, if not most of the Grameen “clones” around the world, have retained the old contract terms.

Finally, the effective rate is heavily influenced by the pattern of loans taken out by an individual borrower. In general, the system rewards borrowers for gradually increasing the size of their total indebtedness over the 10-year period that their GFA balances are unavailable to them. Since GFA balances accumulate over time, a borrower who takes out a series of small, equal loans is effectively borrowing back her own money such that sooner or later the effective marginal cost of borrowing is infinite, as the GFA balance exceeds the loan balance. Those borrowers who substantially increase their loan balances over time dilute the impact of the GFA compensatory balance and receive a lower effective rate.

The “Old” Payment System:

Under the “old” system, Grameen borrowers made weekly payments for 50 weeks. Their principal balance was reduced by the full amount of the payment, and no interest payment was credited. Using standard *post hoc* interest rate calculation techniques, accumulated annual interest on the outstanding balance is calculated as:

$$\mathbf{AAI} = ((\mathbf{BB} + \mathbf{EB})/2) * .2 \quad (1)$$

where **BB** = Beginning Balance and **EB** = Ending Balance. Although the accumulating interest was not entered into the bank’s ledgers, nevertheless, if the loan at any point became non-performing, or if the individual chose to prepay the loan, interest was calculated and applied to the final required payment. In a regular, performing loan all interest was paid in equal two-week installments during weeks 51 and 52 of the year.

The effective interest rate, then, is found by:

$$\mathbf{[(1 + (AAI/(ALB_n - ACB_n))^{(52/50)}) - 1]} \quad (2)$$

Where **ALB**=Average Annual Weekly Loan Principal balance, **ACB** = Weekly Compensatory Balance (GFA Account Balance), **AAB** = (ALB – ACB), and **AAI** = Annual Interest Paid at year-end, Table 1 below (in the “Data Use And Results” section) summarizes the resulting calculation for a series of Tk. 2,000 loans extending over a 10-year period. Note that the ACB has already been adjusted for the effect of the training and share-price loan-initiation fees.

The “New” Payment System:

Under the “new” system, the entire structure of loan payments was altered. The loan payment period is now defined as 46 weeks in length, but factored into the system is the anticipation of 6 official “national holidays” when the week’s payment is suspended. (11) On a regular payment week, the payment required for any loan is Tk. 22 per Tk. 1,000 borrowed, plus Tk. 2 in interest payment for each Tk. 1,000 borrowed (total weekly payment = Tk. 24 per Tk. 1,000 borrowed). Thus, in 45 weekly payments the borrower will have paid back $(\text{Tk. } 22 * 45) = \text{Tk. } 990$. The 46th payment is in the amount of Tk. 20 per Tk. 1,000 borrowed, of which Tk. 10 is the final principal payment and Tk. 10 is a final interest payment. By the end of the loan period, the borrower will have paid a total of $(2 * 45) + 10 = \text{Tk. } 100$, on an average loan balance of Tk 500 for a nominal rate of 20 percent. These payments, of course, must also be supplemented by the required Tk. 5/week deposit into the GFA. If a borrower wants to “prepay” her loan, the remaining principal is thus calculated using only the Tk. 22/week principal payments.

This new payment procedure substantially alters the effective interest rate being charged by the bank, and it complicates considerably the calculation process as well. Because the interest paid is now being charged throughout the loan period, rather than simply tacked on at the end, a comparison of the old and new methods must somehow account for the time value of the interest payments that have been moved forward. In addition, the expected holiday pattern and the offsetting semi-annual interest-credits for the GFA must be reconciled. (12)

The buildup of GFA compensating balances poses a technical problem for the analysis, in that if a borrower maintains a level loan history and makes regular contributions to the GFA, the resulting annual average available loan balances turn negative within just three years. In order for the analysis to make any sense, an average “available loan balance” period must be chosen that provides a reasonable average available loan balance for analysis and at the same time recognizes that compensating balance offsets are severely affecting the resulting effective rate. Since the GFA interest-crediting period is semi-annual, this analysis is based on a series of semi-annual loan periods to provide an overall “average available balance” from which to compute an effective rate.

With (FV_{1a} = the future value at the end of 26 weeks of a series of Tk. 2 loan payments interspersed with regularly-scheduled “national holidays”, (FV_{1b} = the future value at the end of 26 weeks of a series of Tk. 2 loan payments per Tk. 1,000 in initial loan value, interspersed with regularly-scheduled “national holidays” and inserting the final Tk. 10 interest payment per Tk. 1,000 initial loan value at the end of the series on the 26th week) (13), the effective annual rate is found by

$$\{1 + [\sum_{1-n}(\mathbf{AAB}_n - \mathbf{ACB}_n) / (\sum_{1-n}(\mathbf{FV1a}_n + \mathbf{FV1b}_n)/(n*2))]\}^2 - 1 \quad (3)$$

MFIs using the Grameen model, including Grameen itself, have frequently been accused of charging “excessively” high interest rates to support their high administrative costs. (20) The definition of what is “excessive” is, of course, subjective and frequently reflects a lack of understanding of either the difference between gross and net returns on investment or the necessary relationship between risk and return. MFIs themselves, sensitive to the charge and aware of the effect of large numbers on their own constituencies, have couched their interest rates in terminology that significantly understates actual effective rates. Grameen, thus, claims they charge 20 percent annual rates.

ASA, which uses a loan administration model almost identical to Grameen’s, publishes their rate at 12 percent per year. Although several observers have noted that these nominal rates understate reality, most of those observations have been from detractors with a philosophical or political agenda to disparage what they perceive as “excessive” interest rates as being inherently unethical, regardless of either the costs or risks to investment capital. No study has been performed from the perspective of determining what interest rates are in fact being charged by MFIs using actual loan data.

Data Analysis and Results

First analysis: Stable loan balances for 10 years:

For a first, simple analysis, consider a situation where a woman takes out an initial “basic” loan in the amount of Tk. 2,000, which is about what is necessary to purchase, for instance, a small milking cow. She repays her loan on schedule, and in the following years takes out additional loans for the same amount, using debt to increase her herd by an additional cow each year, but not expanding the level of her indebtedness beyond that owed on a single cow. This scenario is, in fact, rare among Grameen borrowers, partly because of the emphasis that loan officers themselves (in the experience of this author) place on increasing loans over a series of years. (14) Nevertheless, it does represent a

reasonable, risk-minimizing approach to a customer's use of Grameen's loan services. Unfortunately, the data suggest that such a risk-minimizing approach on the part of a customer would result in punishingly-high effective interest rates.

Old Payment Method

Making use of formula (2) above:

TABLE I				
Effective Annual Interest				
Old Payment Method				
10-Year Level Loans @ Tk. 2,000				
YEAR	ALB	ACB	AVAIL.	AAI
1	1020	130	890	197.81
2	1020	401	619	97.81
3	1020	637	383	97.81
4	1020	820	200	97.81
5	1020	962	58	97.81
6	1020	1071	-51	97.81
7	1020	1156	-136	97.81
8	1020	1222	-202	97.81
9	1020	1273	-253	97.81
10	1020	1342	-322	97.81
			119	107.81

New Payment Method

Making use of formula (3) above:

TABLE II				
Effective Annual Interest				
New Payment Method				
10-Year Level Loans @ Tk. 2,000				
	ALB	ACB	AAB	FVIa/b
YEAR ONE				
PER 1	1487	98	1389	\$193.79
PER 2	436	161	274	\$112.94
YEAR TWO				
PER 1	1487	329	1158	\$92.94
PER 2	457	473	-16	\$112.94
YEAR THREE				
PER 1	1487	561	927	\$92.94
PER 2	456	714	-258	\$112.94
YEAR FOUR				
PER 1	1487	740	748	\$92.94
PER 2	456	901	-445	\$112.94
YEAR FIVE				
PER 1	1487	878	609	\$92.94
PER 2	456	1045	-590	\$112.94
YEAR SIX				
PER 1	1487	986	502	\$92.94
PER 2	456	1157	-701	\$112.94
YEAR SEVEN				
PER 1	1487	1069	418	\$92.94
PER 2	456	1244	-788	\$112.94
YEAR EIGHT				
PER 1	1487	1133	354	\$92.94
PER 2	456	1311	-855	\$112.94
YEAR NINE				
PER 1	1487	1183	304	\$92.94
PER 2	456	1363	-907	\$112.94
YEAR TEN				
PER 1	1487	1221	266	\$92.94
PER 2	456	1462	-1006	\$112.94
EFFECTIVE ANNUAL RATE:				556.44%

Second analysis: Increasing loan balances for 10 years:

In practice, however, Grameen borrowers are encouraged by the Grameen system to increase their loan balances annually. It is thus more realistic to look at a succession of gradually-increasing loans as more typical of the Grameen borrowing experience. Any series of increases will, of course be arbitrary, but this serves to illustrate the effect of increasing loan balances relative to required GFA compensating balances. The following data is based on a 10-year loan pattern starting at Tk 2,000 and adding an additional Tk. 1,000 to the “rollover” loan balance each year.

Old Payment Method

Using Formula (2):

YEAR	ALB	ACB	AVAIL.	AAI
1	1020	130	890	197.81
2	1530	452	1078	146.71
3	2040	779	1261	195.62
4	2550	1083	1467	244.52
5	3060	1370	1690	293.42
6	3570	1642	1928	342.33
7	4080	1905	2175	391.23
8	4590	2159	2431	440.14
9	5100	2406	2694	489.04
10	5610	2706	2904	537.95
			1852	327.88
	50-WEEK RATE			0.177051407
	EFFECTIVE ANNUAL RATE			18.48%

New Payment Method

Using Formula (3)

	ALB	ACB	AAB	FV1a/b
YEAR ONE				
PER 1	1487	98	1389	\$193.79
PER 2	436	161	274	\$112.94
YEAR TWO				
PER 1	2231	379	1852	\$139.41
PER 2	685	525	160	\$169.41
YEAR THREE				
PER 1	2974	699	2275	\$185.88
PER 2	912	859	53	\$225.88
YEAR FOUR				
PER 1	3718	997	2721	\$232.35
PER 2	1140	1169	-30	\$282.35
YEAR FIVE				
PER 1	4462	1278	3184	\$278.81
PER 2	1368	1462	-94	\$338.81
YEAR SIX				
PER 1	5205	1545	3661	\$325.28
PER 2	1595	1740	-145	\$395.28
YEAR SEVEN				
PER 1	5949	1801	4147	\$371.75
PER 2	1823	2008	-184	\$451.75
YEAR EIGHT				
PER 1	6693	2050	4642	\$418.22
PER 2	2051	2267	-216	\$508.22
YEAR NINE				
PER 1	7436	2293	5143	\$464.69
PER 2	2279	2520	-241	\$564.69
YEAR TEN				
PER 1	8180	2531	5649	\$511.16
PER 2	2507	2881	-374	\$621.16
EFFECTIVE ANNUAL RATE:				44.13%

Third analysis: Actual loan histories of one Grameen Center population over 7 years:

Clearly, the exact pattern of loans experienced by individual borrowers makes a substantial difference to the effective rate of interest paid by an individual borrower. In order to determine what the a MFI using the Grameen model can expect to achieve in average annual returns on a loan portfolio, therefore, it is necessary to examine the actual lending history of borrowers in the Grameen system.

The following series of data is taken from actual loan histories of a Grameen Bank Center that has been in continuous operation for eight years. It includes data from a total of 43 borrowers, the entire population of the Center. Data was gathered not from bank summary records, but from original ledger and journal entries made by bank officers. Individual loan histories and loan record books were followed for each of the 43 borrowers throughout their 7-year loan history. (15)

All types of loans *other than housing* were tracked, including regular, seasonal, animal, and technology loans. Housing loans were excluded from the study because the interest-payment structure differs for these long-term obligations. It should be noted, however, that continued participation in the “regular” loan process entitles a successful borrower to access to housing loans. These housing loans offer the opportunity to lower the total effective borrowing rate for individual customers. (16)

GFA balances reflected actual accumulations in the Group Fund accounts of individual borrowers. Only one of the 43 borrowers at any time took out a loan (effectively withdrew) any funds from the GFA over the seven-year period, and she repaid the loan within the same year it was withdrawn.

Old Payment Method

TABLE V Effective Annual Interest Old Payment Method Actual 7-Year Center Loan History				
YEAR	ALB	ACB	AVAIL.	AAI
1	765	104	661	173.36
2	2034	483	1551	195.05
3	3576	957	2619	342.90
4	4738	1440	3299	454.35
5	5859	1926	3933	561.83
6	7389	2455	4934	708.54
7	6535	2780	3755	626.65
			2965	437.53
	50-WEEK RATE			0.147580011
	EFFECTIVE ANNUAL RATE			15.39%

New Payment Method (17)

TABLE VI Effective Annual Interest New Payment Method Actual 7-Year Center Loan History				
	ALB	ACB	AAB	FV1a/b
YEAR ONE				
PER 1	1115	73	1042	\$170.55
PER 2	327	135	191	\$84.70
YEAR TWO				
PER 1	2966	409	2557	\$185.34
PER 2	911	556	354	\$225.22
YEAR THREE				
PER 1	5214	873	4341	\$325.82
PER 2	1598	1040	558	\$395.94
YEAR FOUR				
PER 1	6909	1346	5563	\$431.73
PER 2	2118	1533	584	\$524.64
YEAR FIVE				
PER 1	8543	1822	6721	\$533.85
PER 2	2618	2029	589	\$648.74
YEAR SIX				
PER 1	10774	2341	8433	\$673.26
PER 2	3302	2570	732	\$818.15
YEAR SEVEN				
PER 1	9529	2658	6870	\$595.45
PER 2	2921	2901	20	\$723.59
EFFECTIVE ANNUAL RATE:				35.57%

Conclusion

Several results emerge from the data, summarized as follows:

(1) The Grameen model lending contract under the “old” methodology still employed by many MFIs trained under Grameen’s “old” system produces effective lending rates below those produced by the new lending contract. The increase in capital accumulation reported by Grameen since the change in their lending contract is likely explained by this change in effective lending rates.

(2) The effective rate being charged under either the old or the new lending contract is heavily dependent on the borrower remaining a debtor. A borrower who simply takes out a one-time loan and repays it on schedule will experience, under the old contract, an effective interest rate of 95.93 percent, and under the new contract an effective rate of 556.44 percent. But by starting with a loan balance of tk. 2,000 and adding tk. 1,000 to the loan principal each year for ten years, the borrower reduces her effective interest rate under the old contract to just 18.48 percent and under the new contract to 44.13 percent. Clearly, there is a substantial economic incentive to increase indebtedness.

(3) Actual loan histories over the seven-year period studied indicate that borrowers are responding to that incentive and substantively increasing indebtedness over time. The average loan balance over the seven-year period increases substantively, with the result that applying the old contract terms would produce an actual *post hoc* effective rate of 15.39 percent, and applying the new terms would produce an actual effective rate of 35.57 percent. The primary reason for this result is the influence of the Group Fund Account “compensating balances” over time. As a loan matures, the borrower is increasingly borrowing back her own capital from the group fund account, but paying interest on a nominal loan balance. The only way the borrower can mitigate this mathematical effect is to continually increase her effective loan balance by taking out ever-increasing loans.

Interestingly, the actual effective rate that was being charged under the old contract terms was *below* that claimed by Grameen in its literature (20 percent). The new contract terms produce actual rates almost twice those being claimed however.

It is also a legitimate question whether it is in the best interests of Grameen borrowers to be incentivized to continually increase their indebtedness over time. The actual effective rates associated with a one-time loan are very high under either contract, and the Grameen system may be producing a culture

of debt that may or may not be sustainable by either individual borrowers or institutionally over time.

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(http://www.grameen-info.org/index.php?option=com_content&task=view&id=39&Itemid=87).
- (4) It is outside the scope of this paper to address the issue of loan default rates at Grameen or other MFIs. The author, however, conducted extensive analyses of Grameen lender histories and current lending records and has come to the conclusion that the bank's officially-stated loan default rates substantially understate both actual defaults and at-risk loan balances. As one example of the problem, Grameen defines a non-performing loan, which they term an "irregular" loan, as one that has not made any payment against either principal or interest for at least 54 weeks. That means that a very substantial proportion of the loans classified as "regular" or performing" are in fact in substantial arrears. The bank has established substantial loan-loss reserves and bank officers have at least a conceptual awareness of the potential problem, but the "loan loss ratios" published for public consumption cannot be used as an explanation for Grameen's ability to cover the high administrative costs associated with microfinance lending.
- (5) The Director of the Dhaka Public Power Commission reported to the author in 2001 during a dinner conversation that as of December, 1999, 19 percent of the country of Bangladesh was electrified. The author knows of no publicly-available data to either support or update that claim. Many rural villages have a single strand of electric wire running to a central pole. Community members tap that central supply with more strands running to their huts to service a bulb or two and share the cost of the monthly bill.
- (6) At wages of Tk. 50/day (about eighty cents US), the cost of labor is virtually irrelevant to the calculation.
- (7) After the initial 10-year holding period the entire amount may be withdrawn. If the customer continues to borrow funds, however, she must continue to make Tk. 5 weekly deposits into the GFA. After the initial 10-year

waiting period a series of 3-year holding periods are initiated, at the end of each of which she may withdraw accumulated GFA compensatory balances.

(8) The author held several discussions with Prof. Yunis and other senior members of Grameen's management. Although the bank in 1998 showed a considerable profit, and although the bank management has determined that further expansion is unwarranted, there appears to be no serious consideration being given to paying out excess capital as dividends to shareholders.

(9) Grameen Bank Statement No. 1, Issue 292, May 22, 2004. p 1.
[http://www.grameen-info.org/bank/AprilUS\\$04.htm](http://www.grameen-info.org/bank/AprilUS$04.htm)

(10) After 1998, Group Fund balances were no longer reported on Grzameen financial statements as a separate item.

(11) Those "national holidays" occur irregularly throughout the year. For the purpose of this analysis a consistent assumption of holidays at weeks 10, 20, 26, 36, 46, 51.

(12) Since some time-value adjustment must be made for the weekly interest charges, the analysis here assumes an opportunity cost of capital for those charges of 0.04, which is the Bank of Bangladesh rate at which Grameen is in turn borrowing funds.

(13) Note that the "shareprice" of Tk. 100 must be deducted from the GFA compensating balance, but must then be treated as an interest payment. The payment is "returned" to the shareholder at the end of their customer relationship with the bank or (as of 2007) as a "dividend" payment, and must be counted then as an effective interest reduction. Since the average period of time from loan initiation to deduction of the shareholder fee from the GFA is 15 weeks, the payment is brought forward at the assumed opportunity cost of capital to the remaining weeks in the first semi-annual average loan-availability period.

(14) This author observed several examples of loan officers in the field encouraging borrowers to increase their loan volumes. The Grameen system also encourages such increases by offering a broader array of loans in larger amounts to customers with a good track record and payment history. After the first year of borrowing, the customer is eligible to take out a "seasonal" loan. After 3 years of successful borrowing, she is eligible for a "housing" loan. Theoretically, Grameen's "Utilization Review" process is designed to assure that marginal loans are used for marginally productive investments and that the purposes to which the loans are put correspond to the loan categories themselves. In practice, this author witnessed widespread abuse of the system.

One result is that the Grameen loan portfolio is not well diversified (an informal review of actual loans suggests that over 40 percent of the entire Grameen loan portfolio, for instance, is for bovine agricultural production in one form or another, placing the entire bank at significant risk), and a great many borrowers, while they may legitimately be accumulating capital, are also accumulating a significant amount of debt. Borrowers are not provided either assistance or advice to utilize their own equity to continue to build their assets. They are, instead, encouraged to continue borrowing in larger and larger sums.

(15) Grameen maintains the integrity of its 40-borrower Centers by substituting a new borrower whenever a customer decides to not take out a new loan in a subsequent year. Individual borrower numbers are “recycled” and the customer number reused for the new borrower. In all cases, these records reflect the history of individual borrowers with “substitutes” disaggregated.

(16) 11 of the 43 borrowers took out housing loans in the 4th, 5th or 6th year of their loan history. The average amount of a housing loan was Tk. 7,045.

(17) If instead of cutting off the loan history at seven years, the last-year’s loan is repeated for three successive years the new-payment-mechanism rate is 39.76 percent.

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Note: The title graphic was designed by Carole E. Scott

