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Pricing for Microfinance

Setting interest rates and service charges is a central issue in microfinance program design. Effective pricing of financial services may to a great extent determine the short- and long-term success a microfinance institution (MFI).

Over the course of the last two decades, there have been several different theories on how MFIs should set prices. Some models of donor-financed programs set interest rates at extremely low levels. Organizations that follow these practices risk erosion of loan funds and discontinued loan services if donations are interrupted.

The emergence of a number of financially viable MFIs demonstrates that microfinance organizations can reach a large number of borrowers on a sustainable basis. An essential requirement for financial viability is that prices charged for financial services are high enough to cover all of an organization's operational and financial costs.

There is an inherent trade-off in pricing financial services. When the price of lending services goes up, the quantity of loans demanded generally goes down. However, it is widely believed that demand for financial services among poor borrowers is highly inelastic—that is, a relatively large increase in interest rates tends to cause a relatively small reduction in quantity of loans demanded. The price inelastic characteristic of the market for micro loans has been well documented and explains one of the golden rules of microfinance: *access is more important to small borrowers than costs*.[1]

1. What This Module Covers

[1] Malcolm Harper, *Profit for the Poor - Cases in Micro-Finance* (Intermediate Technology Publications, 1998), 11-12.

The objective of the module is to acquaint students with pricing mechanisms for microfinance programs. This module discusses the important elements that microfinance institutions consider when setting effective interest rates. In addition, this module provides instruction on how to calculate the effective interest rate on a loan. Particular attention is paid to relationship between interest rates and financial viability.

2. Loan Terms

How loan repayment is structured is of central importance to both borrowers and lenders. **Loan terms** describe the process of loan repayment in terms of price and time. The terms of a loan include:

- Time elements:
  - Duration of loan contract
  - Repayment intervals
  - Grace period (time between loan disbursement and first repayment)
- Price elements:
  - Interest payments
  - Amount of forced savings, if required
  - Fees and commissions

The loan terms determine both the yield on an MFI's portfolio and the real cost to the borrower. One of the most critical elements is the amount and structure of interest payments. As is demonstrated below, a quoted interest rate of 3%, for example, may generate dramatically different levels of interest income depending on how interest payments are calculated.

3. Calculating Interest Payments

The amount that a borrower pays to a lending institution in interest is determined not only by the stated interest rate but also by the method used to calculate interest. Two general techniques are widely used: the declining balance method and the "flat" method. The declining balance method imposes lower costs on the borrower than does the flat method. Equivalently, the declining balance method generates lower yield on an MFI's portfolio than does the flat method.

In the following sections, we will consider examples of interest calculated using these two methods. For simplicity, we will ignore present value considerations and we will assume that when a weekly or monthly rate is annualized, an "Annual Percentage Rate" (APR) method is used (compounding is not taken into account).

3.1 Declining Balance Method

When the declining balance method is used, interest is computed based on the balances that remain in the borrower's hands. As successive installments of principal are repaid, these balances decline. In this case, interest is not charged on the amount of the loan principal that the borrower has already repaid.

Consider the following example of a 3 month, $300 loan to be repaid in 6 equal monthly installments, calculated on declining balances. The payment made each period (PMT) is $53.56. In the early periods when the outstanding balance is high, the contribution of interest to the PMT is relatively high and the contribution of principal repayment to the PMT is relatively low. As the principal balance declines, the contribution of interest payments to the PMT declines as well.

Table 1: Declining Balance Method

Loan amount: $ 300; Loan term: 3 months; Loan repayment period: every 2 weeks; annual interest rate: 48 percent				
Period	Principal	Interest	Total payments[2]	Outstanding balance
0	-	-	-	300.00
1	47.56	6.00	53.56	252.44
2	48.51	5.05	53.56	203.93
3	49.48	4.08	53.56	154.45
4	50.47	3.09	53.56	103.99
5	51.48	2.08	53.56	52.51
6	52.51	1.05	53.56	0.00
Total	300.00	21.35	321.35	-

[2] *PMT* function was used to calculate total payments.

In this declining balance example, total payments by the borrower are 321.35.

3.2 Flat Method

When the flat method is employed, interest is computed based on the original face amount of the loan rather than on the declining balances. Computing interest using the flat method instead of the declining balance method has the effect of raising the payment made each period, and, therefore, increasing the "effective" interest rate to the borrower. This means that the loan is more costly to the borrower and, equivalently, that the loan generates more income for the lending institution.

Consider the same example as last time, except now interest is calculated using the flat method. In this case, the contribution of interest payments to the PMT is constant: in each period, the borrower repays $50 in principal and $6 in interest. Here, the payment made each period is $56, which is less than the PMT of $53.56 in the declining balances case. The total payments made by the borrower in the flat rate case are $336.

Table 2: Flat Method

Loan amount: $ 300; Loan term: 3 months; Loan repayment period: every 2 weeks; Annual interest rate: 48 percent

Period	Principal	Interest	Total payments	Outstanding balance
0	-	-	-	300
1	50	6	56	250
2	50	6	56	200
3	50	6	56	150
4	50	6	56	100
5	50	6	56	50
6	50	6	56	0
Total	300	36	336	-

All else equal, total payments by the borrower when interest payments are calculated using the flat method are greater than total payments when interest payments are calculated using the declining balance method. Therefore, the flat method generates more revenue for the lending institution and imposes higher costs on borrowers.

3.3 The Effective Interest Rate

The effective interest rate is the rate that a client is "really" paying, based on the amount of loan proceeds actually in the client's hands during each period of the life of the loan. The formula to calculate the effective interest rate is:

$$\text{Effective Interest Rate} = \frac{\text{Total interest and fees}}{\text{Average balance outstanding}} \times \frac{\text{Periods in a year}}{\text{Periods in the loan term}}$$

Using this formula, we will compute the effective interest rates implied by the two previous examples of declining balance and flat interest rates on otherwise identical loans.[3]

Declining balance case:

In the declining balance case, interest payments totaled 21.35, the average balance is 177.9, there are 12 months in a year and 3 months in the loan period.

$$\text{Effective interest rate} = (21.35/177.9) \times (12/3) = 0.48$$

In the case of declining balance interest rate calculations (without fees, upfront interest payments, or compulsory savings), the effective interest simply equals the annualized interest rate.

Flat rate case:

In the flat rate case, interest payments totaled 36 and the average balance was 175.

$$\text{Effective interest rate} = (36/175) \times (12/3) = 0.82$$

[3] In other texts, the effective interest rate may have a different meaning. Always investigate the specific components of the calculation when comparing different scenarios.

All else being equal, the effective interest rate is higher in the case of a flat rate than in the case of interest computed on declining balances.

4. Other Factors that Determine Effective Interest Rates

A lending institution can increase the effective interest rate of a loan (and increase the portfolio yield) by changing any of the following factors:

- Requiring that a portion of the loan be deposited as compulsory savings prior to or after loan disbursement.
- Requiring payment of interest at the beginning of the loan, as a deduction from the amount of principal disbursed to the borrower. For example, take the declining balances case described in Table 1.
- Charging an initial fee or commission in addition to the interest
- Requiring more frequent payment of principal and interest

Consider the following example of a $300, 3 month loan with flat 48% annual interest and a fee of 3%.

Table 3: Flat rate with fee

Loan amount: $ 300; Loan term: 3 months; Loan repayment period: every 2 weeks; Annual interest rate: 48 percent; Fee=$10.

Period	Principal	Interest	Total payments	Outstanding balance
0	-	10	10	290
1	50	6	56	240
2	50	6	56	190
3	50	6	56	140
4	50	6	56	90
5	50	6	56	40
6	50	6	56	
Total	300	46	346	-

In this case, the total interest payments are 46 and the average balance is 165. Therefore, the effective interest rate is (46/165) x (12/3) = 1.12. In the case without the upfront fee, the effective interest rate is 82%. With an up-front fee of $10, the

effective interest rate is 112%. This example demonstrates that requiring an up-front fee raises the effective interest rate.

5. Setting Interest Rates

How should an MFI decide what prices to charge its clients? In order to achieve financial sustainability, program income must cover all programmatic and financial costs. For most MFIs without other assets that provide income, this means that interest income from loans must cover all costs. Therefore, the following are important factors to consider when an MFI decides an interest rate:

- Administrative expenses, including rent and utilities, salaries, travel and transportation, office supplies, etc.
- Inflation and depreciation
- The cost of loan losses
- The cost of the funds that the MFI borrows.

5.1 Nominal vs. Real Interest Rates

The interest rate charged to borrowers is usually called the *nominal interest rate*. This may be different from the *real interest rate*, which is approximately calculated as follows:

$$\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Rate of Inflation}$$

If the nominal interest rate is higher than the rate of inflation, then the real interest rate is positive. For borrowers, a positive interest rate means that they have actually paid something for the benefit of using the money that they have borrowed. In order for the loan fund to maintain its value, it is essential for an MFI to charge a nominal rate of interest that is greater than the rate of inflation.

5.2 A Sustainable Interest Rate

The Consultative Group to Assist the Poorest (CGAP) has designed a straightforward method to allow MFIs to determine what effective interest rate they need to charge in order to achieve financial viability. Below is an overview of the computation. For

more detailed treatment, see the full paper, "Microcredit Interest Rates," at http://www.cgap.org/html/p_occasional_papers01.html.

The interest rate required for financial sustainability (R) is determined by five elements, each expressed as a percentage of the average outstanding loan portfolio:

- **administrative expense rate (*AE*),** calculated by dividing total annual administrative expenses by average outstanding loan portfolio;
- **targeted capitalization rate(*K*),** the net real profit that the MFI decides to target, divided by the average loan portfolio;
- **loan loss rate (*LL*),** calculated by dividing annual loss due to uncollectible loans by average outstanding loan portfolio;
- **the market cost of funds rate (*CF*),** for details on calculation, see the CGAP paper; and
- **investment income rate(*II*),** the income expected from an MFI's financial assets other than the loan portfolio, divided by the average loan portfolio.[4]

In general, health MFIs have administrative expense rates between 10-25%, targeted capitalization rates between 5-15%, and loan loss rates between 1-2%. R, the minimum required annualized effective interest rate for financial sustainability, is calculated as follows:

$$R = \frac{\mathrm{AE} + \mathrm{K} + \mathrm{LL} + \mathrm{CF} - \mathrm{II}}{1 - \mathrm{LL}}$$

The CGAP paper provides the following example for the interest rate calculation for a hypothetical MFI:

- Administrative expense rate = .25
- Targeted capitalization rate = .16
- Loan loss rate = .02
- Cost of funds rate = .21
- Investment income = .015

In this example, R = (.25+.16+.02+.21-.015)/(1-.02) = .638.

6. Prices and Viability

Pricing is a direct determinant of viability, though not the only determinant. An MFI that is able to recover programmatic costs and compensate for the impact of inflation on the portfolio (in other words, a financially viable MFI) must charge higher prices, in general, than an MFI that is financed by donor funds. Studies have found that the most financially viable programs differ significantly from less viable programs in their willingness to set interest rates at levels that allow them to fully recover costs.[5] This is not to say, however, that high pricing is a signal of a financially viable MFI. Certainly, there are MFIs that both charge high prices and are not financially viable.

Furthermore, it is important to note that many donor-financed MFIs that are not financially viable stand-alone institutions also serve an important function. Financial viability may or may not be a part of the mission of an MFI. Since financially viable institutions generally charge higher prices than institutions that are not financially viable, some scholars have written that financially viable programs have not had success reaching the poorest of the poor. The goal of extending credit services to the poorest households may justify ongoing subsidization.[6]

Lastly, judging an MFI's viability based on its ability to cover program and financial costs through interest payments is a meaningful standard only to relatively mature institutions. Young microfinance programs that attempt to cover all costs would be forced to charge exorbitantly high interest rates. MFIs can be expected to cover all relevant costs only after having an opportunity to attract a sizable client base and acquiring appropriate tools for efficiency.

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[4] Richard Rosenberg, *Microcredit Interest Rates, CGAP Occasional Paper No. 1*(Washington, D.C.: World Bank, Consultative Group to Assist the Poorest), 1.

[5] Elisabeth Rhyne. "The Yin and Yang of Microfinance: Reaching the Poor and Sustainability", MicroBanking Bulletin, No. 2 (July 1998), pp. 6-9.

[6] Morduch, Jonathan, "The Microfinance Promise." *Journal of Economic Literature*, Vol. 37 (December 1999), pp. 1569-1614.

7. Prices and the Operating Environment

A microfinance organization should examine the ability of its potential clients to pay for financial services. In addition, it is important for an MFI to investigate the other financial options available to its client base. Very often, access to credit among poor and especially poor rural populations is very limited or in fact non-existent. An MFI's competitors, if they exist, may include: local moneylenders, commercial banks, and other microfinance organizations.

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6. Waterfield, Charles, and Ann Duval, *CARE Savings and Credit Sourcebook*, (CARE, 1996).