



Discussion Note

MFI Pricing and Valuation – an analysis of key drivers

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Glossary

- ◆ CRAR : Capital-To-Risk-Weighted Assets Ratio also known as CAR (Capital Adequacy Ratio), is a measure of the amount of a financial institution's capital expressed as a percentage of its risk-weighted credit exposures. Capital adequacy ratio is defined as Capital/Risk .
- ◆ IRR : Internal rate of return is the annualized effective compounded return rate which can be earned on the invested capital, i.e. the yield on the investment. Put another way, the internal rate of return for an investment is the discount rate that makes the net present value of the investment's cash flow stream equal to zero.
- ◆ TBU : Twenty Branch Unit (the equivalent of an area office of an MFI).
- ◆ Tier 1 capital : Part of primary capital and consists of equity capital.
- ◆ Tier 2 capital : Composed of supplementary capital, which is categorised as undisclosed reserves, revaluation reserves, general provisions, hybrid instruments and subordinated term debt. Supplementary capital can be considered Tier 2 capital up to an amount equal to that of the Tier 1 capital.
- ◆ TV : The terminal value (continuing value or horizon value) of a security is the present value at a future point in time of all future cash flows when we expect stable growth rate forever. It is most often used in multi-stage discounted cash flow analysis, and allows for the limitation of cash flow projections to a several-year period.
- ◆ Upfront fee : Fee collected at the time of disbursement of the loan in the form of loan processing fee, account maintenance fee or membership fee.

Provision of financial services to rural areas of India has expanded rapidly in the last decade or so. This has been led by expansion of micro finance with distinct models dominating the sphere of service delivery. The on-lending model where Micro Finance Institutions (MFIs) lend five member Grameen Style Joint Liability Groups (JLGs) seems to be emerging as the prominent model. Given the magnitude of the financial inclusion challenge, and taking into account the recent expansion of the sector, there is a need to analyze the models of micro finance services delivery from different perspectives, with a view to inform policy and practice choices.

Micro finance interest rates

Pricing is important because it reflects the risks, efficiency and the profitability of the institution and also in some sense reflects an institution's perspective on these. For a financial institution, perceptions of the risks with its assets, its operating efficiency and the assumptions about 'reasonable' returns on capital are all translated into the interest rate. It also reflects the environment in which the organization is operating. For instance, subsidies or taxes by the government affect the pricing in a way that is not directly in the institution's control. If we hold such external factors constant, variation in pricing provides an interesting point of departure for studying variations among institutions.

We think that this variation is a good reason for a detailed analysis of pricing and provides an opportunity to understand what drives pricing decisions.

Though pricing is a much debated issue, except for a few categorical conclusions (for instance, CGAP's 'Interest Rate Ceilings are Almost Always Harmful')*, it is difficult to find conclusive arguments on this matter. This note is an effort to take the debate forward, by a deeper, quantitative exploration into interest rates charged by micro finance institutions.

This note is about *the pricing of micro loans by the micro finance institutions involved in on-lending*. The objective of this paper is to:

- ◆ Analyze a stylized model of MFIs, with the key operating assumptions underlying their business model, and try to build a relationship between operating costs and various parameters of growth and efficiency.
- ◆ Present a framework for pricing the micro loans for MFIs, which allows us to understand the various components of the pricing, test different scenarios, and arrive at a range for interest rates for micro loans under these scenarios.
- ◆ Discuss the possible reasons behind the differences between the prevailing interest rates and those predicted in this note. The discussion, though situated in the context of India, is global in scope.

* Helms, Brigit and Xavier Reille. *Interest Rate Ceilings and Micro finance: The Story So Far*. CGAP Occasional Paper 9. 2004.

The model of loan pricing for an MFI

Components of loan pricing

MFIs, like other financial institutions, determine the interest rates to be charged on the loans on the basis of four factors. The first consideration is the *financing cost*, which is basically the interest paid on the funds borrowed for on-lending. Secondly, the MFI takes into account the total *operating costs* incurred for originating and servicing the loans. These costs include staff salaries, rent, utility bills (electricity, internet connectivity, etc), depreciation, travel, transport, administration and so forth. Thirdly, a *loan loss provision* is added to the financing cost and operating cost. The extent of this provision varies and is mainly a function of portfolio quality. The last factor is the *cost of capital*, which is the expected return to equity holders. The operating costs and loan loss provision largely depend on the operating model and quality of operations of the institution. The financing cost is determined by many factors, including the regulatory environment's effect on the supply of debt into the asset class. The cost of capital is somewhat of a discretionary factor, depending on the expectations of the institution's owners.

There are some variations in the way interest rates are presented by MFIs. The two most common ways in which MFIs charge interest rates are: 1. A flat interest method where, even though principal payments are made periodically, interest continues to be charged on the original amount disbursed, and 2. the diminishing balance method where the interest is computed on the principal outstanding. Conversion factor for a flat interest rate to a declining interest rate is approximately 1.9 for a 50-week loan at a flat rate of 10%. The conversion factor varies considerably depending on the flat rate in question (see Table 1).²

Table 1: Conversion factor: Flat interest rates to YTM

Flat rate	YTM	Conversion factor
5.0%	9.70%	1.94
8.0%	15.30%	1.91
10.0%	19.00%	1.90
12.0%	22.70%	1.89
15.0%	28.20%	1.88
20.0%	37.10%	1.86

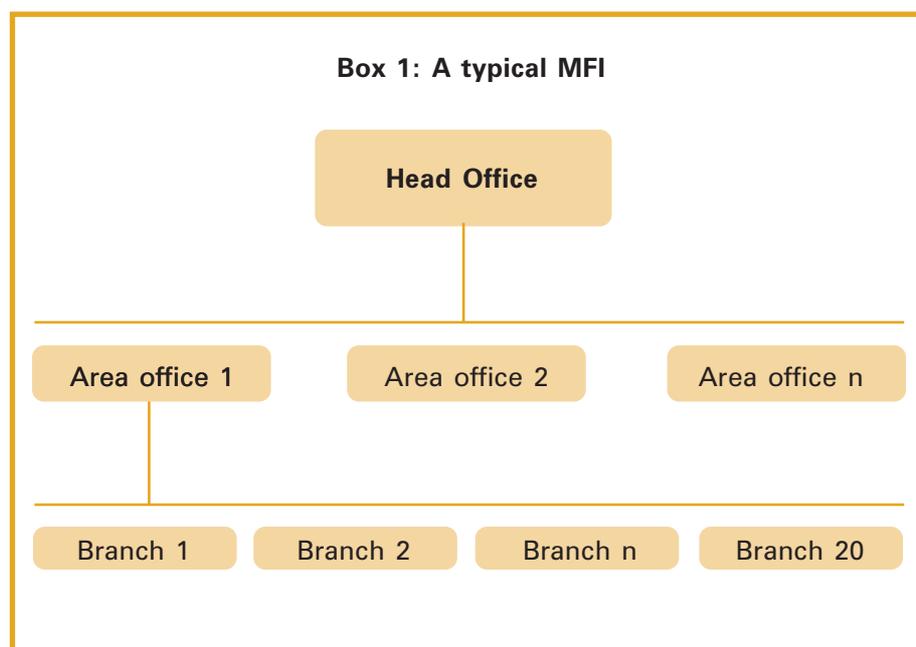
² All our calculations are based on Yield to Maturity unless specifically mentioned otherwise. For simplicity we have used a single conversion factor of 1.89 for all the flat rates.

In addition to the stated interest rates, many MFIs also charge upfront fees in the form of loan processing fees, account maintenance fees or membership fees. These fees are usually charged as a percentage of loans disbursed and are collected upfront instead of collecting over the loan tenure. Though such a fee adds to the pricing on the loan in a manner similar to interest rates, it is presented as a fee. We have considered this while discussing the interest rate numbers.

MFI operating assumptions

We attempt to analyze a stylized model of on-lending MFIs, with the key operating assumptions regarding the drivers of operational cost, level of productivity, costs of debt financing, and loan loss. A typical MFI works with a three-tier structure (See Box 1). The first layer is the branches. We have considered stylized MFI branches, each with a Branch Manager, an Accountant and six Field Officers (FOs). FOs regularly travel to group meeting places and collect loans. The Accountant is responsible for not merely the accounts function but also promotion and management of a few groups in areas near the branch office. Second layer above the branch office is the area office. Usually, 20 branches operate under each area office. The area office is responsible for the operations of all the branches under its area. The area office operates out of one of the branches and has two accountants, one administration person and an area manager in addition to the normal branch staff.

The area office reports to the head office (HO), which houses various departments like: planning, finance and resources, MIS, internal audit, administration, human resource development and enterprise development and promotion. The investment in MIS is usually low. The branches maintain the loan and expense ledgers and send the monthly trial balances to the HO. The accounts of head office and the area offices are mentioned separately.



The following financial assumptions (Annexure 1) constitute the model:

- ◆ The total (Tier 1 plus Tier 2) capital adequacy (CRAR) for the MFI is set at 15%.³
- ◆ Tier 2 capital is priced at 15% per annum. This acts as a mezzanine capital or subordinated debt, and would be considered for capital adequacy. For this model, the tier 2 capital is taken at the level of 5% of risk-weighted assets.⁴
- ◆ Financing cost for senior debt is assumed to be 12.5% per annum.⁵
- ◆ The rate of depreciation is taken as 20% per annum.⁶
- ◆ Loan loss provision is set at 0.5%, considering the history of low defaults in the micro loan portfolios.
- ◆ We have taken into account a compulsory life insurance policy for each client.⁷
- ◆ Average insurance premium collected per customer is taken as INR 200.

³ The appropriate level of capital for a MFI depends on regulatory requirements and the expected rate of return for shareholders. Assuming that the shareholders would like to maintain the lowest level of capital to ensure high returns on their investment, the CRAR taken is a number specified by the regulator. In India, commercial, cooperative and local area banks are required by the Reserve Bank of India to maintain a minimum capital adequacy ratio of 9%, while the minimum capital adequacy for non-bank finance companies (NBFCs) is 12%. In its circular (DNBS PD. CC. No. 125/03.05.002 / 2008-2009) RBI has advised NBFC's with assets more than INR 1000 million to achieve a CRAR of 15% before March 2010.

⁴ Tier II capital here is taken as Hybrid (Debt and Equity) Capital Instruments and Subordinated Debt. According to Basle II accord, Total Tier II capital is limited to Tier I capital, i.e. Tier II capital cannot be more than Tier I capital. Tier II capital in the structure not only reduces the overall cost of equity but also provides a tax shield since interest is a tax deductible expense.

⁵ As on 7th May, 2009 the Corporate Bond Spread for a tenor of 10 years with an A rating – 260 basis points. Risk Free Rate for a ten year Bond (Government Bonds) – 7.65%. The assumptions of 12.5% financing cost seem appropriate under the present circumstances in India.

⁶ As per Indian Companies Act, 1956 the rate of depreciation for furniture and fittings is 10% and for computers it is 40% under written down value method. For a MFI around 60% of the assets are furniture and fittings, and the rest are computers, printers, fax machines, phones etc. Based on these the average depreciation rate considered is 20%.

⁷ In order to control adverse selection and significantly reduce administrative costs, most MFIs in India have compulsory insurance cover products for their customers as condition for accessing another service.

- ◆ The upfront fee charged to customers is taken as 2% on loan disbursed.⁸
- ◆ Field officer productivity and the loan sizes are the two key drivers that define cost of operations for a MFI.
 - ◆ The loan cycle amounts taken are
 - First Loan cycle - INR 12,000
 - Second Loan cycle - INR 13,000
 - Third Loan cycle - INR 14,000
 - Fourth Loan cycle - INR 16,000
 - Fifth Loan cycle - INR 18,000⁹
 - ◆ The analysis for this model is done in real terms, which means we have nullified the effect of inflation by taking it as zero and, to set it off, we have assumed zero growth in loan cycle amounts.
 - ◆ The field officer productivity is taken at 700 loan clients per FO¹⁰.

A twenty branch unit as a building block

As a starting point for analysis in this note, we have considered a Twenty Branch Unit (TBU) as the building block of an MFI. A TBU can be thought of as the equivalent of an area office of an MFI. All scale-up essentially happens with this unit being replicated across geographies. We believe that this is the appropriate unit of analysis for analyzing the costing of loans by micro finance institutions. Thus, we have assumed a zero growth model, wherein pricing is analyzed for just one TBU over the period of analysis, i.e. fifteen years.

We have prepared the financial statements for a TBU for a period of fifteen years. For this initial analysis of the TBU, the allocated HO cost has been taken to be zero. The argument here is that taking Head Office costs for twenty branches may skew the numbers. The number is 0.08% for a MFI with 10 TBUs and 0.02% for a MFI with 50 TBUs. (See table 2 for expected HO costs as % of loan outstanding at different growth rates based on our calculations.)

Table 2: HO costs: 15th year costs as % of loan outstanding

Number of TBUs	10	15	20	25	40	50
15th year HO cost as % of loan outstanding	0.08%	0.05%	0.04%	0.03%	0.02%	0.02%

⁸ MFIs in India try to recover some of their administrative costs through upfront fees like application fees, loan processing fees, membership fees etc. The fee ranges from 1% to 3%.

⁹ For the creation of a model we have taken the best case loan cycle scenarios and have built sensitivity around them.

¹⁰ For the creation of model we have taken the best case Field Officer productivity scenario and have built sensitivity around it.

Analysis

The financial statements on the above assumptions were prepared for a single TBU for the period of 15 years (Annexure 3). The cost of operations as % of loan outstanding for a single TBU decreases from 13.8% in the first year to 3.7% in the fifteenth year (Table 3). The total transaction cost (cost of operations + cost of debt financing) in the 15th year turns out to 15.7%.

Table 3: Cost components as % of loan outstanding

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15
Branch cost	11.8%	4.5%	4.1%	3.8%	3.3%	3.0%	3.0%
Area office cost	1.5%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%
Loan loss	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Cost of operations	13.8%	5.3%	4.9%	4.6%	4.1%	3.7%	3.7%
Cost of senior debt	11.5%	11.2%	11.2%	11.2%	11.2%	11.2%	11.2%
Cost of junior debt	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%	0.8%
Cost of financing	12.4%	12.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Total cost	26.2%	17.3%	16.9%	16.5%	16.0%	15.7%	15.7%

Sensitivity analysis

Productivity

The most important component of the cost incurred by the MFI is the personnel expenses (around 2/3rd of the total operating expense). Since staff is the means of disbursement and collection of money, the staff productivity becomes a very important determinant of the cost. We therefore checked the sensitivity of the 15th year cost number at different productivity levels of the field staff (Table 4).

Table 4: Transaction cost sensitivity to Field Officer productivity

Loans per FO	400	500	600	650	700	750	800
Transaction cost % of loan outstanding	18.19%	17.03%	16.26%	15.96%	15.70%	15.48%	15.29%

The transaction cost in 15th year increases from 15% of loan outstanding to 18% of loan outstanding as the average field officer productivity falls from 800 loan accounts to 400 loan accounts.

Growth

One can argue that the cost numbers appear to be low because of the zero growth considered in the model. The faster growing MFIs incur higher costs in the growth phase on account of having unutilized capacity in new branches. But once the MFI reaches its peak capacity, the cost as % of loan outstanding for the faster growing MFI is expected to be lower than the slower growing MFI because of larger number of clients availing higher loan amounts (higher loan cycles). To understand the correlation between the growth and the transaction costs we have built scenarios around MFI growth.

If we consider a MFI with 500 branches (25 TBUs) as its peak capacity and apply different growth rates (as in table 5) to it, we find that the 15th year cost numbers for an aggressive growth plan are marginally lower than the cost at slow and very slow growth plan.

Table 5: Growth scenarios considered for finding the impact of growth on cost

	Growth scenarios (unit – TBU)					
	Single TBU	Very slow	Slow	Moderate	Fast	Very fast
Year 1	1	2	2	3	4	5
Year 2	1	4	5	5	8	9
Year 3	1	6	8	8	12	13
Year 4	1	8	11	11	16	17
Year 5	1	10	14	14	20	21
Year 6	1	12	17	17	24	25
Year 7	1	14	20	20	25	25
Year 8	1	16	22	23	25	25
Year 9	1	18	24	25	25	25
Year 10	1	20	25	25	25	25
Year 11	1	22	25	25	25	25
Year 12	1	25	25	25	25	25
Year 13	1	25	25	25	25	25
Year 14	1	25	25	25	25	25
Year 15	1	25	25	25	25	25

Table 6 below highlights the impact of growth path followed on the transaction cost of MFI. You can see that costs in the 15th year, when the MFI has reached full capacity utilization, are roughly the same for a TBU and for the MFIs growing at various rates. This is because on full capacity utilization, there is no reason for the rate of growth in the past to have a bearing on costs. The costs as % of loan outstanding for a MFI, therefore, remain around 15.7% at full capacity (15th year when all its clients are in the fifth loan cycle) irrespective of the growth path that the MFI chooses to follow.

The analysis at the TBU level seems to be appropriate, if the state of full capacity utilization is considered, since the cost number at full capacity utilization does not change with the increase in number of TBUs.

Table 6: Transaction cost sensitivity to FO productivity and MFI growth

Growth scenario						
Transaction cost sensitivity to growth rate	Single TBU	Very slow	Slow	Moderate	Fast	Very fast
Cost as % of loan outstanding	15.70%	15.76%	15.73%	15.72%	15.72%	15.72%

Loan sizes

An obvious driver of transaction costs (as percentage of loan outstanding) is the size of the loan. The transaction cost of an INR 5,000 loan is not much different from the transaction cost of an INR 1,000 loan. Both loans require more or less the same amount of staff time for meeting the borrower to appraise the loan, processing the loan disbursement and repayments, and follow-up monitoring.

To understand how the cost number changes with the loan cycle amounts, we have assumed five different MFIs (Table 7) with varying loan cycle amounts.

Table 7: Loan size scenarios considered for finding the impact on costs

Scenario name	MFI 1	MFI 2	MFI 3	MFI 4	MFI 5
First cycle	5,000	10,000	10,000	12,000	12,000
Second cycle	6,000	11,000	11,500	13,000	13,000
Third cycle	7,000	12,000	13,000	14,000	14,000
Fourth cycle	8,000	13,000	14,500	15,000	16,000
Fifth cycle	9,000	14,000	16,000	16,000	18,000

Considering the loan size scenarios taken in Table 7, Table 8 shows the sensitivity of transaction costs to the loan cycle amounts, for given level of FO productivity. The table below shows that the transaction cost (as a percentage of loans outstanding) can range from 15% to 24% depending on the loan sizes and the field officer productivity. Even for a given level of FO productivity, the range can be 4-6% wide. As mentioned earlier, this is expected because, up to a certain extent, the costs do not increase with higher loan sizes, unless there is an altogether different kind of loan product.

Table 8: Transaction cost sensitivity to loan cycle amounts, for given FO productivity

Transaction cost sensitivity to loan cycle amounts		Loan cycle amounts				
		MFI 1	MFI 2	MFI 3	MFI 4	MFI 5
FO productivity	400.00	24.00%	19.85%	18.92%	18.92%	18.19%
	450.00	22.71%	19.02%	18.19%	18.19%	17.55%
	500.00	21.67%	18.36%	17.61%	17.61%	17.03%
	550.00	20.83%	17.81%	17.14%	17.14%	16.61%
	600.00	20.13%	17.36%	16.74%	16.74%	16.26%
	650.00	19.53%	16.98%	16.40%	16.40%	15.96%
	700.00	19.02%	16.65%	16.12%	16.12%	15.70%

Profitability analysis

If we consider the best case scenario in terms of productivity and loan sizes, the 15th year operating cost number for a TBU as mentioned earlier comes to 3.7% of the portfolio outstanding at full capacity. The effective cost of debt financing works out to be 11.96% of the portfolio outstanding (considering the cost of senior and junior debt to be 12.5% and 15% respectively). The total cost at that point of time works out to 15.7% of loan outstanding.

On revenue side, let us consider a flat upfront fee of 2%, which translates to 3.78% on declining balance, and fee income from compulsory life insurance, which comes to 0.32% of loan outstanding. If the rate of interest charged to the customer is 8% flat, the cash flows give a 24% IRR¹¹. The equity requirement for a TBU in the first year and second year is around INR 18.6 million and INR 36.4 million respectively. Thereafter all the surplus after paying interest to creditors and taxes to government is given as dividends to the equity investors¹².

The IRR calculation takes into account the terminal value¹³ at the end of 15th year. The rate of growth for the purpose of terminal value is taken as zero since there is no growth either in terms of branches/clients or loan sizes.

¹¹ The internal rate of return (IRR) is the rate of return produced by each Rupee for the amount of time that the Rupee is in the investment.

¹² In a case where the MFI is to grow beyond one TBU, the dividends here would mean addition to the internal capital, thereby reducing the external capital required to finance the growth.

¹³ Terminal value – also known as horizon value, is the present value at a future point in time of all future cash flows when the growth rate is expected to be stable or zero forever. $TV = FCF_{N+1}/(k - g)$. TV is the value of future cash flows at a future point in time which is immediately prior to N+1, or at the end of period N, which is the final year in the projection period, k being the discount rate and g being the growth rate.

Table 9: Returns for equity investors

Year	Equity required	ROA = PBT/ Avg assets	ROE = PAT/ Avg equity	Cash flows to equity
Year 1	1,86,42,720	-2.0%	-60%	- 1,86,42,720
Year 2	3,64,23,357	2.2%	16%	- 3,64,23,357
Year 3	-	2.5%	18%	65,55,817
Year 4	-	2.7%	20%	81,64,594
Year 5	-	3.2%	23%	86,84,247
Year 6	-	3.6%	25%	1,39,29,730
Year 7	-	3.6%	25%	2,13,56,846
Year 8	-	3.6%	25%	2,13,54,219
Year 9	-	3.6%	25%	2,13,52,117
Year 10	-	3.6%	25%	2,13,50,435
Year 11	-	3.6%	25%	2,13,49,090
Year 12	-	3.6%	25%	2,13,48,014
Year 13	-	3.6%	25%	2,13,47,153
Year 14	-	3.6%	25%	2,13,46,464
Year 15	-	3.6%	25%	2,13,45,913
Terminal Value				10,67,15,791
IRR				24%

The discount rate is taken as 20%¹⁴. For the assumptions considered, the valuation for one TBU at full capacity utilization (zero growth stage) is around INR 100 million. That means the valuation per branch is around INR 5 million. Box 2 highlights the relationship between the interest rates and branch/MFI valuations.

¹⁴ Varma, Jayant R. and Samir K. Batra. *A First Cut Estimate of the Equity Risk Premium in India*. IIMA Working Paper. 2006. In this paper they have re-created data series to allow a robust calculation of an equity risk premium for India. They came up with 12.5% equity risk premium. We have taken risk free rate to be 7.5% and hence the expected rate of return of 20%.

Box 2: Interest rates and MFI valuations

Let's consider our stylized MFI with 500 branches that intends to provide a standard loan repayable in one year with average loan outstanding amounts for 1st, 2nd, 3rd, 4th, 5th loan cycles being 12000, 13000, 14000, 16000 and 18000 respectively. With an upfront charge of 2% and the loan productivity of 700 customers per field officer, the net cash flow and the terminal value for each branch at different interest rates will be as following:

Flat interest rate	15th year cash flow per branch (INR)	TV per branch (INR)	MFI valuation (INR million)
8.0%	10,67,296	53,35,790	2,668
10.0%	21,25,696	1,06,27,789	5,314
12.0%	31,84,096	1,59,19,789	7,960
14.0%	42,42,496	2,12,11,789	10,606
15.0%	47,71,696	2,38,57,789	11,929
18.0%	63,59,296	3,17,95,789	15,898

This means a MFI charging 15% flat interest rate will be valued around INR 12000 million.

Keeping other factors constant, IRR is a function of interest rates charged to the customer. The table below shows the IRR's sensitivity to flat interest rates and upfront fees charged to the customers.

Table 10: IRR sensitivity to upfront fee and interest rates charged for the best case scenario

IRR sensitivity to different flat interest rates and upfront fee charged		Flat interest rate				
		5%	8%	10%	12%	15%
Upfront fees	0.0%	-ve IRR	-ve IRR	23.7%	61.4%	180.5%
	1.0%	-ve IRR	8.5%	40.3%	89.9%	255.6%
	2.0%	-ve IRR	23.7%	61.4%	128.3%	368.9%
	3.0%	-ve IRR	40.3%	89.9%	180.5%	551.9%
	4.0%	8.5%	61.4%	128.3%	255.6%	883.5%
	5.0%	23.7%	89.9%	180.5%	368.9%	1631.0%

According to our calculations, at 15% flat interest rate the MFI can give its investors an internal rate of return of around 180%. This figure seems to be too high. One argument against this estimate could be that it is based on best case scenarios in the industry. Therefore, we have considered a pessimistic scenario as well.

Let's consider a MFI with a field officer productivity of 400 customers and the loan cycles as follows:

First cycle	-	INR 6,000
Second cycle	-	INR 7,000
Third cycle	-	INR 8,000
Fourth cycle	-	INR 10,000
Fifth cycle	-	INR 12,000

Table 11 below shows the IRR sensitivity to different flat interest rates and upfront fee charged to customers, for the pessimistic scenario in terms of loan sizes and productivity.

Table 11: IRR sensitivity to upfront fee and interest rates charged for pessimistic scenario

IRR sensitivity to different flat interest rates and upfront fee charged		Flat interest rate				
		5%	8%	10%	12%	15%
Upfront fees	0.0%	-ve IRR	-ve IRR	-ve IRR	3.7%	31.3%
	1.0%	-ve IRR	-ve IRR	-ve IRR	13.4%	40.5%
	2.0%	-ve IRR	-ve IRR	3.7%	22.3%	51.8%
	3.0%	-ve IRR	-ve IRR	13.4%	31.3%	60.7%
	4.0%	-ve IRR	3.7%	22.3%	40.5%	73.3%
	5.0%	-ve IRR	13.4%	31.3%	51.8%	87.7%

If we consider the current interest rate and upfront fees charged by MFIs, i.e. 15% flat interest rate and 2% upfront fees, the IRR should be around 50%. Going back to the best case scenario, if the expected rate of return of the investors is 20%, the interest rate charged to the customers should be around 8% flat along with an upfront fee of 2%.

Analyzing the prevailing interest rates being charged by MFIs today, from this analysis it seems that the returns to investors are much higher than the expected rates of return in similar industries. Therefore there is a need to explore what could be the reasons for the interest rates to be where they are today.

Why are the prevailing interest rates higher than implied by our model?

One explanation could be that expected rate of returns for micro finance is much higher than expected rate of returns in the market. Thus, the cost of capital goes up and so does the interest rate. Let's consider this argument. Should the expected returns for micro finance be significantly higher than those on the market?

In our IRR calculation, terminal value has a lot of weight. The terminal value is a function of growth (G) and the expected rate of return (k). G in the case considered is zero and the expected rate of return has been assumed at 20%. We checked how the expected rate of return affects the IRR.

Expected rate of return v/s IRR		Flat rate of interest		
		8%	10%	12%
Expected rate	10.00%	25.2%	61.6%	128.3%
of return (k)	20.00%	23.7%	61.4%	128.3%
	30.00%	23.1%	61.3%	128.3%
	40.00%	22.8%	61.3%	128.3%

The table above shows that if k is more than 30%, at 8% flat interest rate micro finance business will not be able to meet the expectation of the investors. So, what should be the expected rate of returns from micro finance? There is some evidence that micro finance business may not move with the general economy. So, one could argue that it provides a significant diversification opportunity. The credit risk historically has also been quite low, and so has been the volatility. Perhaps there is a need to consider what reasonable cost of capital for micro finance should be.

Another explanation for the high interest rates could be that growth is being financed by revenues rather than equity capital. MFIs may be capitalizing the surplus generated every year to finance the growth. The argument could be that it is difficult to raise external capital. But, is that really a concern? Given the low riskiness in the micro finance business, shouldn't the return of 20% be good enough to attract the investors and raise external capital? If we are looking at TBU as a unit of growth, the pace at which a MFI plans to grow is a function of how many TBUs needs to be replicated in what duration. If one TBU requires INR 50 million of capital, 5 TBUs will require INR 250 million of capital. By charging higher interest rates the surplus generated by one TBU is used to finance the growth of other TBU.

Summary and conclusion

The purpose of this analysis and discussion was to explore the pricing model of micro finance institutions, and understand what factors could be motivating the prevailing interest rates. The analytics pivoted around the stylized model of a Twenty Branch Unit (TBU) that mirrors a typical Indian MFI's operations.

The TBU cost structure was "shocked" with a number of variants to understand effect of varying a) field officer productivity b) loan sizes c) rate of growth. Transaction costs, as percentage of loans outstanding, are very sensitive to average loan sizes and field officer productivity. Operating cost as a percentage of loan outstanding falls sharply as the TBU approaches full capacity utilization. At full capacity utilization, operating costs are insensitive to historical growth rates. However, across all scenarios we find that the range of operating costs is 3.7% to 11.5%. The divergence between actual interest rates in micro finance in India

and what our model suggests may be explained by the fact that MFI expansion is being financed through revenues rather than equity; this is puzzling given our findings on returns to equity.

We also provide a tool for MFIs to see the impact of various interest rates on the returns to the equity investor (dividends and terminal value). We find that the prevalent pricing by MFIs, even accounting for most pessimistic operating cost assumptions, provides the equity investor returns of 50% and upwards.

We hope this paper sparks an analytical debate on the pricing structure of MFIs in India and elsewhere and provides the MFI CEO/CFO and investors practical tools to understand the link between operating assumptions, cost structure, pricing and return on equity. All the calculators in the paper are available on www.ifmrtrust.co.in/mfiresources

Annexure 1

Assumptions

MFI Branch		
Field Officers/Loan Officers per Branch	6	
Accountant	1	
Branch Manager	1	
Support Staff/Peon	2	
MFI area office		
Branches per Area Office	20	
Accountants	2	
Admin	1	
Area Manager	1	
MFI HQ		
Manager HR	1	
Manager Internal Audit	1	
Internal Audit Team	5	
Manager Planning	1	
CEO	1	
CFO	1	
Finance Team	3	
COO	1	
Operations Team	5	
Support Office (Stationary)	3	
Back-end staff	6	
HR Team	2	
Other assumptions		
Customers per Field Officer	700	
Branch customers at full capacity	4,200	
Capital adequacy	10%	
Cost of senior debt	12.5%	pa
Cost of Tier II capital	15.0%	
Cost of equity	20%	pa
Increase in salaries	0%	pa
Inflation	0%	pa
Depreciation	20%	pa
Loan loss as % of outstanding	0.5%	

Cost Assumptions – Branch		
Rent	5,000	pm
Electricity	3,000	pm
Connectivity(telephone/mobile)	3,000	pm
Stationery	4,000	pm
Fuel expenses paid to Fos	7,200	pm
Training	50,000	pa
Misc expenses	5%	of other
Salaries		
Field Officers/Loan		
Officers per branch	6,500	pm
Assistant Branch Managers/ Supervisors	10,000	pm
Branch Manager	12,000	pm
Support Staff/Peon	3,000	pm
Cost assumptions – Area Office		
Salaries		
Accountants	8,000	pm
Admin	4,000	pm
Area Manager	20,000	pm
Cost assumptions – HQ		
Rent	25,000	pm
Electricity	8,000	pm
Connectivity(telephone/mobile)	25,000	pm
Stationery	10,000	pm
Travel expenses	30,000	pm
Training	2,00,000	pa
Misc expenses	5%	of other
Salaries		
Manager HR	30,000	pm
Manager Internal Audit	30,000	pm
Internal Audit	15,000	pm
Manager Planning	12,000	pm
CEO	1,00,000	pm
CFO	35,000	pm
Finance Team	15,000	pm
COO	35,000	pm
Operations Team	15,000	pm
Support Office (stationary)	5,000	pm
Back-end staff	5,000	pm
HR Team	10,000	pm
Revenue assumptions		
Flat interest rate charged		
per annum	15%	pa
Upfront fees	2%	pa
IF insurance		
% of borrowers (Compulsory)	100%	
Average premium	200	
Commission	15%	

Annexure 2

Infra

Branch Assets			
Asset	Number	Price	Amount
Tables	6	1,500	9,000
Chairs	6	800	4,800
Branch Manager cabin	1	50,000	50,000
Computers	2	35,000	70,000
Almirahs	1	10,000	10,000
Safe (usually Godrej)	1	15,000	15,000
Dot Matrix printer	2	7,000	14,000
Other fittings	1	15,000	15,000
Fascia	1	3,000	3,000
Total Assets			1,90,800
Area Office - assets			
Branch Infra +			1,90,800
Table	1	1,500	1,500
Chairs	3	800	2,400
Computer	1	35,000	35,000
Printer	1	7,000	7,000
Area Manager cabin	1	50,000	50,000
Total Assets			2,86,700
HQ assets			
Computers	25	35,000	8,75,000
Chairs	40	1,500	60,000
Tables	25	1,500	37,500
Printer	10	6,000	60,000
File cabinets	10	30,000	3,00,000
Fax machine	1	2,500	2,500
Generator	1	25,000	25,000
Printing station	2	12,000	24,000
Visitors chairs	5	1,000	5,000
Projector	1	30,000	30,000
AC	3	18,000	54,000
Total assets			1485000

Annexure 3

TBU financial statements (best case scenario)

Income and Expenses	Year 1	Year 2	Year 5	Year 10	Year 15
Interest income	1,61,28,000	8,19,84,000	11,02,08,000	12,09,60,000	12,09,60,000
Upfront fee income	40,32,000	2,04,96,000	2,75,52,000	3,02,40,000	3,02,40,000
Commision from insurance	5,04,000	25,20,000	25,20,000	25,20,000	25,20,000
Other income (Interest on Bank Bal.)	3,20,000	16,26,667	21,86,667	24,00,000	24,00,000
Total income	2,09,84,000	10,66,26,667	14,24,66,667	15,61,20,000	15,61,20,000
Operational expenses					
Branch	1,25,65,560	2,43,29,760	2,43,29,760	2,43,29,760	2,43,29,760
Area Office	16,40,556	16,00,488	16,00,488	16,00,488	16,00,488
Loan loss	5,33,333	27,11,111	36,44,444	40,00,000	40,00,000
PBIT	62,44,551	7,79,85,308	11,28,91,974	12,61,89,752	12,61,89,752
Financial expenses					
Interest on borrowed funds	1,23,17,155	6,06,92,300	8,14,54,206	8,93,75,849	8,93,84,645
Interest on Tier II capital	8,69,446	42,84,162	57,49,709	63,08,883	63,09,504
PBT	-69,42,050	1,30,08,845	2,56,88,060	3,05,05,019	3,04,95,602
Tax	-	39,02,654	77,06,418	91,51,506	91,48,681
PAT	-69,42,050	91,06,192	1,79,81,642	2,13,53,514	2,13,46,922
Balance Sheet					
Application of funds	Year 1	Year 2	Year 5	Year 10	Year 15
Loans (Net of provision)	10,61,33,333	53,95,11,111	72,52,44,444	79,60,00,000	79,60,00,000
Cash in hand	21,22,667	1,07,90,222	1,45,04,889	1,59,20,000	1,59,20,000
Balance at bank	32,00,000	1,62,66,667	2,18,66,667	2,40,00,000	2,40,00,000
Current assets, loans and advances	11,14,56,000	56,65,68,000	76,16,16,000	83,59,20,000	83,59,20,000
Overdraft					
Short term loans					
Current liabilities	-	-	-	-	-
Net current assets	11,14,56,000	56,65,68,000	76,16,16,000	83,59,20,000	83,59,20,000
Fixed assets	44,70,160	46,53,648	50,11,817	52,64,463	53,47,251
Total	11,59,26,160	57,12,21,648	76,66,27,817	84,11,84,463	84,12,67,251
Liabilities	Year 1	Year 2	Year 5	Year 10	Year 15
Capital	1,86,42,720	1,15,92,616	6,73,65,387	8,41,15,368	8,41,25,716
Add profits/losses	-69,42,050	91,06,192	1,79,81,642	2,13,53,514	2,13,46,922
Add/less Capital raised/					
Dividends	1,08,054	3,64,23,357	-86,84,247	-2,13,50,435	-2,13,45,913
Closing balance	1,15,92,616	5,71,22,165	7,66,62,782	8,41,18,446	8,41,26,725
Teir II capital	57,96,308	2,85,61,082	3,83,31,391	4,20,59,223	4,20,63,363
Debt	9,85,37,236	48,55,38,401	65,16,33,644	71,50,06,794	71,50,77,163
Total liabilities	11,59,26,160	57,12,21,648	76,66,27,817	84,11,84,463	84,12,67,251

