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Determinants of Microfinance Interest Rates

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ABSTRACT

Microfinance loans have long been associated with relatively high interest rates. There is a wide variation of interest rates charged by microfinance institutions (MFIs) across countries, as well as some dispersion of interest rates across MFIs within the same country. The source of interest rate variation can result from institution specific characteristics such as, average loan size and the composition of female borrowers. The dispersion in prevailing interest rates in the formal financial sector across countries may partially contribute to the variation of microfinance interest rates across countries. I use yield on gross loan portfolio as a proxy for the average interest rate on loans, the average loan balance as a measure of average loan size, and lending rate for commercial loans to represent the interest rate in the formal financial sector. This study attempts to analyze the dispersion of interest rates on microfinance loans by showing its association with loan size, female composition of borrowers, and the prevailing lending rates. Using a large panel of 1,531 MFIs, I show that microfinance interest rates have a statistically significant negative relationship with loan size, and a positive association with commercial lending rate and the female composition of borrowers.

KEYWORDS

Commercial Lending Rates; Interest Rate; Microfinance Institution; Outreach

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1. Introduction

Microfinance Institutions (MFIs) allocate small loans to poor households charging interest rates that are substantially higher than interest rates charged by traditional banks. High interest rates have persisted in the industry despite the tremendous improvement in efficiency and profitability of MFIs. Hence, there is some contention about the ethical aspect of the perpetuation of such high interest rates, even when most of the MFIs are making profits. The optimal interest rate should be incentive-compatible for both the lender and the borrower. Interest rates should be low enough that the net return from utilizing the loan is no less than the other available alternatives for the borrower. These alternatives can either be the opportunity cost of foregone wages or the net return from borrowing from a different source. Finally, the interest rate must be greater than the cost of funds for the MFIs, such that lending is a viable option. Interest rates that meet the criteria would not present an ethical dilemma, even if they appear to be high. If the persistence of high interest rates is primarily due to the inherent higher cost of servicing collateral free loans, it would alleviate the ethical concern about high interest rates.

The cost of funds, type and structure of the loans, and the interest charged by competing lenders determine the variation of interest rates charged by MFIs. While the cost of funds for MFIs varies due to their individual access to funds from donors and aid agencies at subsidized rates, many MFIs concurrently rely on source of funds obtained at the prevailing market rate in the formal financial sector. Hence, the interest rate for microfinance loans would have a positive association with the benchmark lending rate prevailing in the former financial sector, which already reflects the overall cost of funds.

Smaller loans may entail higher costs per dollar of loans than larger loans, and as such, the MFIs would be compelled to charge a higher rate of interest for a smaller loan than the interest rate charged for a larger loan. Conning (199) found that MFIs set interest rates that are inversely related to the size of the loan. Paxton (2003), Cull et al. (2007), and Hermes et al. (2011), show that greater depth of outreach reduces efficiency and raises costs, resulting in higher interest rates. While women typically receive smaller loans, they also show better repayment rates (Abdullah & Quayes, 2016), making their impact on interest rates mixed. Nonetheless, Meyer (2019) confirmed that MFIs charge higher rates to both female clients and small loans. Dorfleitner et al. (2013) found operating expenses significantly influence interest rates and noted some MFIs subsidize these rates. Baquero et al. (2018) showed that while nonprofit MFIs maintain stable rates regardless of competition, for-profit MFIs lower rates when facing competitive pressure. The current study is an empirical exercise of showing an association of microfinance interest rates with commercial interest rates, size of loans, and composition of women borrowers.

2. Statement of Hypothesis

While charging borrowers with lower incomes higher interest rates may seem like an accounting necessity to cover higher costs and potential default, such a practice is inconsistent with the social goals of microfinance institutions. In view of the above discussion, we have the following two hypotheses:

Hypothesis 1: Interest rates have a negative relationship with average loan balance.

Hypothesis 2: Interest rates have a positive relationship with larger fraction of female borrowers.

There is an implicit relationship between the microfinance industry and the formal financial sector. Hence, any change in the cost of funds and the rate of inflation will affect the interest rate in the microfinance industry. In addition, it seems like a reasonable assumption that it will also have a positive association with the lending rate in the formal financial sector. As such, commercial lending can serve as an anchor cost of funds, rate of inflation, and the aggregate demand and supply of loanable funds in the economy. Interest rates prevailing in the formal financial sector, e.g., the commercial lending rate should have a positive causal effect on interest rates charged by MFIs. Hence, the third hypothesis is:

Hypothesis 3: Interest rates have a positive relationship with commercial lending interest rates.

3. Description of Data and Variables

The study utilizes an unbalanced panel of 1,531 MFIs from 92 countries spanning from 2003 to 2018, with 7,292 observations in total. The source of MFI specific financial, outreach, and locational information used in the study is MIX Market data, publicly available from the World Bank Data Catalogue. The source of commercial bank lending rates for each country is World Bank Open Data.

Nominal yield is the proxy for average interest rate charged by MFIs in this study, as all explanatory variables are in nominal terms. While yield may also capture the negative impact of portfolio at risk and provision for losses in general, it remains an excellent proxy for interest rate.

Table 1. Descriptive Statistics.

Variable	Average	Standard Deviation	Minimum	Maximum
Nominal Yield	0.3196	0.1503	0	0.9669
Gross Loan Portfolio	51,334,612	184,436,620	1,979	5,773,396,452
Equity	13,123,161	47,163,129	313	1,345,951,964
Operating Expense	0.1644	0.0955	0.0002	0.4909
PAR30	0.0628	0.1048	0	1
Women Borrowers	0.6410	0.2718	0	1
Average Loan Balance	1,677	7,200	1	306,601
Lending Rate	0.1409	0.0800	0.0259	0.6772
For Profit MFIs	0.4176	---	---	---

Note: Sample size equals to 7,322 for all variables listed above.

The commercial lending interest rate in the country is a proxy to capture the factors that may affect interest rates, including cost of funds and inflation. We can expect an increase in the cost of funds or the rate of inflation to result in an increase in the interest rate on loans. I have also used equity and regional dummy variables as additional control variables.

Since the sample includes data from many countries, the study uses average loan balance per borrower divided by the gross national income per capita of the respective country, to normalize for the variation in income across countries. We can expect average loan size to have a negative association with interest rate since smaller loans entail higher cost per dollar. While most of the female borrowers are relatively poor, they also have a better repayment rate. Hence, a greater composition of female borrowers may either have positive or negative effect on interest rate.

As per table 1 above, the average lending rate is fourteen percent, and the average nominal yield is thirty-two percent. This indicates that MFIs charge an interest rate that is approximately eighteen percent higher than commercial lending rates. The average rate of portfolio at risk for thirty days or more is a little over six percent, indicating that MFIs enjoy a reasonably high rate of repayment. The average fraction of women borrowers across all the MFIs in the sample is sixty-four percent. The sample mean of Average Loan Balance across MFIs is $1,677.

The following equation was estimated to test the three hypotheses described in section II. The variables gross loan portfolio, total equity, and average loan balance are in natural logarithm form in the regression model below:

$$YLD = \alpha_i + \beta_1 LGLP_{it} + \beta_2 LTEQ_{it} + \beta_3 OPEX_{it} + \beta_4 PAR30_{it} + \beta_5 WBR_{it} + \beta_6 LALB_{it} + \beta_7 LRAT_{it} + \beta_8 PROF_i + \varepsilon_{it}$$

where, YLD = Nominal yield on gross loan portfolio

LGLP = Log of gross loan portfolio

LTEQ = Log of total equity

OPEX = Operating expense ratio

PAR30 = Portfolio at risk for 30 days or more
WBR = Fraction of women borrowers
LALB = Log of average loan balance per borrower divided by per capital GNI
LRAT = Average commercial lending rate in the country
PROF = 1 if MFI is for profit and 0 if MFI is not for profit

4. Model and Empirical Results

Table 2. Nominal Yield Rates of Microfinance Institutions.

Variable	FE	RE	HT
Log of Gross Loan Portfolio	-0.0032**	-0.0039***	-0.0043***
	(-1.97)	(-2.71)	(-2.88)
Log of Equity	0.0035**	0.0052***	0.0044***
	(2.19)	(3.66)	(3.09)
Operating Expense	0.5414***	0.7067***	0.6213***
	(27.87)	(42.86)	(35.47)
Portfolio at Risk 30 Days	-0.1395***	-0.1269***	-0.1331***
	(-14.88)	(-14.13)	(-15.13)
Women Borrowers	0.0459***	0.0267***	0.0491***
	(5.48)	(3.86)	(6.16)
Log of Average Loan Balance	-0.0169***	-0.0165***	-0.0204***
	(-7.35)	(-9.65)	(-9.40)
Lending Rate	0.2613***	0.2585***	0.2599***
	(8.30)	(11.15)	(10.17)
Profit	---	0.0409***	0.0411***
	---	(7.44)	(5.47)
Constant	0.1519***	0.1085***	0.1202***
	(7.13)	(6.73)	(6.39)
Observations	7,292	7,292	7,292
Number of MFIs	1,531	1,531	1,531
Overall R^2 / Wald χ^2	0.5065	0.5530	2,484.74

*Note: t statistic in parentheses; Fixed Effects Model (FE); Random Effects Model (RE): Hausman-Taylor Model (HT). ***, **, * indicates statistically significant at the one percent, five percent, and ten percent respectively.*

Initially, equation 1 was estimated using fixed effects and random effects panel regression models. The Hausman test rejected the null hypothesis of consistent random effects estimates, and hence the study uses estimated coefficients from the fixed effects model for making inferences, but reports the random effects estimates to show the difference between for profit and non-profit MFIs. Next, the estimation of a Hausman-Taylor panel regression model addresses the possible problem of endogeneity from the inclusion of loan size and female composition of borrowers in the model. Table 2 below presents the estimated results from the three models.

Size of MFI has a small negative effect on interest rates, indicating learning and economies of scale. MFIs can leverage a higher level of equity for an increased level of borrowing, leading to a statistically significant positive effect on yield. As expected, provision for losses measured by portfolio at risk for 30 days lowers the yield.

Commercial lending rates have a positive effect on yield and the estimates are statistically significant at the one percent level, which provides strong empirical evidence in support of hypothesis 2. As per the fixed effects and Hausman-Taylor models, yield would rise by 0.26% for one percentage point increase in commercial lending rate. This indicates that while commercial interest rates affect the yield on microfinance loans, there are other factors which play a role in the determination of yield. Operating expense has a strong positive effect on interest rates.

In general, poorer borrowers receive smaller loans in comparison to less poor borrowers. Hence, the lower average loan balance indicates greater depth of outreach. The negative association of average loan balance with

yield implies that greater depth of outreach raises the rate of interest. The estimated coefficient is statistically significant at the one percent level for each of the models used in this study. From an ethical standpoint, it means that poorer borrowers face higher interest rates. Not only do microfinance borrowers pay an average of eighteen percentage points higher rate of interest than borrowers in the formal financial sector, the poorest among the microfinance borrowers pay an even higher rate of interest than borrowers who are not so poor.

To exacerbate the above-mentioned ethical problem, women borrowers end up paying a higher rate of interest than male borrowers pay. Although, this higher yield may reflect better repayment rate by women, it may still be an indication of women borrowers who are poorer in general, pay a slightly higher rate of interest on their loans. The estimated coefficient is statistically significant at the one percent level for all three models.

Table 3. Nominal Yield Rates of MFI with Time Fixed Effects (TE).

Variable	FE(TE)	RE(TE)	HT(TE)
Log of Gross Loan Portfolio	0.0056***	0.0001	0.0028*
	(3.02)	(0.03)	(1.71)
Log of Equity	0.0056***	0.0063***	0.0062***
	(3.53)	(4.44)	(4.31)
Operating Expense	0.5404***	0.7022***	0.6225***
	(27.97)	(42.72)	(36.2)
Portfolio at Risk 30 Days	-0.127***	-0.1188***	-0.1224***
	(-13.47)	(-13.14)	(-13.88)
Women Borrowers	0.0358***	0.0206***	0.0373***
	(4.28)	(2.97)	(4.72)
Log of Average Loan Balance	-0.0240***	-0.0195***	-0.0257***
	(-9.99)	(-11.12)	(-11.46)
Lending Rate	0.1950***	0.2206***	0.2236***
	(6.04)	(9.32)	(8.58)
Profit	---	0.0378***	0.0365***
	---	(6.90)	(4.74)
Constant	-0.0284	0.0319	0.0448**
	(-0.97)	(1.60)	(2.12)
Observations	7,292	7,292	7,292
Number of MFIs	1,531	1,531	1,531
Overall R^2/ Wald χ^2	0.4840	0.5536	2,685.96

*Note: t statistic in parentheses; Fixed Effects Model (FE); Random Effects Model (RE): Hausman-Taylor Model (HT). ***, **, * indicates statistically significant at the one percent, five percent, and ten percent respectively.*

The data used in the study spans over eighteen years and some factors have changed and evolved over time. To eliminate omitted variable bias caused by excluding unobserved variables that evolve over time but are constant across the MFIs, the study uses time fixed effects and Table 3 reports the results. Lending rates continue to have a positive association with yield that is statistically significant at the one percent level across all three models. Furthermore, the size of loans has a negative relationship with interest rates, and the estimated coefficients are statistically significant at the one percent level for all three models. Third, a greater composition of women borrowers is associated with higher interest rates in all three models and results are statistically significant at the one percent level.

Next, the first two columns of Table 4 report results from random effects model and Hausman-Taylor model including time invariant country fixed effect. Smaller loan size and larger fraction of women borrowers result in higher interest rates and the estimated coefficients are statistically significant at the one-percent level. Lending rate in the formal financial sector has a statistically significant positive effect on microfinance interest rates. Finally, the third and fourth columns of table 4 report results from random effects model and Hausman-Taylor model including both time fixed effect and country fixed effect. Once again, the results show that higher percentage of female

borrowers, smaller loan size, and commercial lending rate all have a statistically significant positive effect on microfinance interest rates. This shows that the empirical results from this study are robust to different model specifications and even with the inclusion of time effects and country fixed effects.

Table 4. Nominal Yield Rates of MFIs with Country Fixed Effects (CE) and Time Fixed Effects (TE).

Variable	RE(CE)	HT(CE)	RE(CT)	HT(CT)
Log of Gross Loan Portfolio	-0.0027*	-0.0027*	0.0021	0.0034**
	(-1.91)	(-1.86)	(1.37)	(2.13)
Log of Equity	0.0045***	0.0041***	0.0056***	0.0054***
	(3.25)	(2.93)	(4.04)	(3.86)
Operating Expense	0.6144***	0.5955***	0.606***	0.5868***
	(36.22)	(33.48)	(35.90)	(33.54)
Portfolio at Risk 30 Days	-0.1323***	-0.1338***	-0.1238***	-0.1244***
	(-15.07)	(-15.19)	(-14.05)	(-14.11)
Women Borrowers	0.0456***	0.0542***	0.038***	0.045***
	(6.39)	(6.64)	(5.33)	(5.55)
Log of Average Loan Balance	-0.0185***	-0.0197***	-0.0233***	-0.0265***
	(-9.88)	(-8.97)	(-11.96)	(-11.58)
Lending Rate	0.2569***	0.2504***	0.1809***	0.1826***
	(8.60)	(8.21)	(5.82)	(5.88)
Profit	0.0156***	0.0143**	0.0126**	0.0099
	(2.82)	(2.25)	(2.25)	(1.53)
Constant	0.38***	0.9077***	0.2941***	0.22
	(3.74)	(1.97)	(2.88)	(0.73)
Observations	7,292	7,292	7,292	7,292
Number of MFIs	1,531	1,531	1,531	1,531
Overall R^2/ Wald χ^2	0.6762	3,967.75	0.6872	4,144.62

*Note: t statistic in parentheses; Fixed Effects Model (FE); Random Effects Model (RE): Hausman-Taylor Model (HT). ***, **, * indicates statistically significant at the one percent, five percent, and ten percent respectively.*

5. Conclusion

This study analyzed the factors that contribute to the variation in the interest rates on microfinance loans. Using a large panel of MFIs, the study showed that both depth of outreach and outreach to women, contribute to an increase in the interest rate charged on microfinance loans. This poses an ethical problem since MFIs charge the poorest borrowers the highest interest rates. It confirms prior findings that greater operating expense results in higher interest rates. If MFIs can focus on reducing administrative and monitoring expense pertaining to smaller loans by standardizing loan terms, specializing in regions and borrowers, and incorporating mobile technology, this would alleviate the high interest burden on borrowers of small loans who are primarily poor. This study also finds the anticipated result that commercial lending rate is positively associated with the microfinance interest rate. The empirical findings in this study are robust to using three different panels regression model and remain consistent even after incorporating time fixed effects, country fixed effects, and both time and country fixed effects.

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Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

Author contributions

The author was solely responsible for all aspects of the research, including conceptualization, data curation, formal analysis, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing – original draft, and writing – review & editing.

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