



Benchmarking across Borders

# EXPECTED APR: FACTORING IN THE PRICE DETERMINANTS IN FINANCIAL INCLUSION TO SUPPORT RESPONSIBLE PRICING ANALYSIS

SUMMARY



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## Academic team

Laura Viganò, Professor, Department of Management, Economics and Quantitative Methods, University of Bergamo

Davide Castellani, Associate Professor, Management, Economics and Quantitative Methods, University of Bergamo

Tommaso Buffoni, Master Student, University of Bergamo

Carlotta Pellegrini, Master Student, University of Bergamo

Alessandra Rozzoni, Master Student, University of Bergamo

Madlene Sageder, Master Student, Johannes Kepler Universität Linz

Christa Weikerstorfer, Master Student, Johannes Kepler Universität Linz

## MFR Team

Lucia Spaggiari, Business Development Director, MFR

Carla Urresta, Financial Analyst, MFR

Alfonso Macchiarelli, Intern, MFR

## RESPONSIBLE PRICING IN FINANCIAL INCLUSION

Financial Service Providers (FSP) have to be sustainable. Yet, responsible pricing is a very sensitive topic in financial inclusion: the tension between the social mission of improving the lives of clients at the bottom of the pyramid and the fact of charging high interest rates is a recurrent reputational risk for the financial inclusion industry.

In order to understand pricing in financial inclusion it is paramount to calculate Annual Percentage Rates (APR) with a reliable method that captures the price components used in financial inclusion (i.e. nominal interest rate, method of interest calculation, fees and commissions, mandatory deposits, taxes). MicroFinance Transparency ([MFT](#)) greatly contributed to this topic by developing tools for [APR calculation](#) and [analysis methods](#) that are tailored to microfinance.

### PROBLEM STATEMENT

In spite of the high reputational risk involved by failing to understand if a given level of prices in financial inclusion is justified or not, there are surprisingly very few resources available to the FSP Boards of Directors (BoD), to the investors and to the emerging countries regulators to analyze responsible prices in an objective manner.

As of now, as far as MFR knowledge is concerned, the industry still lacks a study of the determinants of prices in financial inclusion, with general validity.

The present research aims at contributing to the study of price determinants.

### METHODOLOGY

In order to develop an econometric model able to estimate the expected APR (dependent variable) of an FSP, an initial revision of the literature (see annex 1) has been made to establish those factors at macroeconomic, institution and loan level, that are relevant to determine the APR (independent variables). The following step consisted in verifying the statistical significance of the variables identified in the literature, preliminarily selected based on the availability of data, rejecting those that showed a poor contribution to the model. As a final step, the estimated APR of the institutions has been compared with the real one and the difference between these two values has been investigated to understand its nature. The data used for the analysis were taken from ATLAS. The final sample is composed of 121 observations (i.e. data of the same FSP in different years) of 95 FSPs. The analysis time span is from 2011 to 2018, even though the majority of data are from 2016.

As far as geographical diversification is concerned, the institutions in the sample are from 38 different countries all over the world.

### RESULTS

The following 5 factors are statistically significant in the determination of the APR: **ROA; Operating expense ratio; % of loan portfolio in trade sector; Financial expense ratio; Being a regulated financial institution.**

. reg apr roa opexratio trade finexratio regulated

Source	SS	df	MS	Number of obs	=	121
Model	9.94670874	5	1.98934175	F(5, 115)	=	116.69
Residual	1.96054737	115	.017048238	Prob > F	=	0.0000
				R-squared	=	0.8353
				Adj R-squared	=	0.8282
Total	11.9072561	120	.099227134	Root MSE	=	.13057

apr	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
roa	1.499785	.3083303	4.86	0.000	.889042	2.110528
opexratio	1.01656	.1011138	10.05	0.000	.8162729	1.216847
trade	.4099557	.058634	6.99	0.000	.2938131	.5260984
finexratio	1.391235	.2183301	6.37	0.000	.9587652	1.823705
regulated	.0775804	.0255048	3.04	0.003	.0270603	.1281005
_cons	-.0838948	.0265599	-3.16	0.002	-.1365049	-.0312847

The coefficient of determination ( $R^2$ ) reached by the econometric model is 83.53%. The individual marginal contribution of each variable to the APR is described below, with the operational expense ratio playing the most important role in estimating the APR (54,42%) to estimating APR<sup>1</sup>.

	ROA	Opex	%Trade	Finex	Regulated
<b>Mean</b>	8,81%	54,42%	35,73%	24,80	6,45%
<b>Std. Dev.</b>	15,82%	29,81%	23,14%	15,25%	10,56%
<b>Median</b>	7,29%	48,41%	32,16	22,87%	0%
<b>q 10</b>	6,24%	32,73%	12,21%	5,77%	0%
<b>q 90</b>	26,87%	77,51%	60,30%	46,16%	26,75%

Based on the regression presented above, the APR was estimated for each FSP considered and subsequently divide the sample in two groups: FSPs that present a real APR higher than the expected APR obtained using the model and those that present a real APR lower than the estimated one.

In order to explain these differences, the financial variables were studied to understand the different features of the two groups. The following table illustrates the indicators that resulted to be most characterizing and their respective levels assumed in the group of institutions with a real APR lower than the expected one and vice versa.

	Real APR < E(APR)	Real APR > E(APR)	Explanation
<b>Inflation</b>	Low	High	High inflation explains higher real APR
<b>Charter type</b>	Non Bank	Bank	Banks report a higher real APR
<b>Level of deposit</b>	Low	High	Banks with high deposits report higher real APR
<b>Financial expenses</b>	Low	High	High financial expenses explain higher real APR
<b>Operational expense</b>	Low	High	High operational expenses explain higher real APR

## LIMITATIONS AND SUGGESTIONS FOR FURTHER ANALYSIS

Some of the limitations of this study are: the length of data (most of the data used are from 2016, 2017 and 2018) and the small sample (121 FSPs). For a deeper analysis, a larger sample in terms of number of FSPs and periods available would help to increase the predictability of the model. For instance, a longer time series of data would allow to detect the effect that lagged values of independent variables have on the actual APR.

<sup>1</sup> The sum of the marginal contribution factors is greater than 100% because the correlation between the analyzed variable has not been taken into consideration

Determinant	Effect on APR	Literature
<b>Loan size</b>	The lower the loan the higher the needed APR to cover operating costs (administration,...). There is an inverse relationship between loan size and APR because of the fixed costs that MFIs have to face regardless the size of the loan.	Rosenberg et al. (2013): Microcredit Interest Rates and Their Determinants Mersland, R., Strøm, R.Ø., 2010. Microfinance mission drift? World Development, 38(1), 28- 36.
<b>Loan term</b>	There is also an inverse relationship between loan term and APR, due to the amortization of costs: if the term is short, costs must be amortized in shorter time and this is more expensive.	Qian / Kong / Dua (2019): Proximity, information, and loan pricing in internal capital markets: Evidence from China
<b>FSP size</b>	Larger firms benefit from economies of scale and scope: they might be more efficient and this enables larger institutions to charge lower interest rates.	Hermes / Hudon (2018): Determinants of the Performance of Microfinance Institutions: A Systematic Review
<b>Productivity</b>	High productivity leads to more efficiency and it could decrease costs. Consequently, lower interest rate is charged.	Hermes / Hudon (2018): Determinants of the Performance of Microfinance Institutions: A Systematic Review
<b>Credit risk</b>	The higher the risk the higher the APR will be. If borrowers are more experienced the credit risk decreases and also the APR. Lenders build a risk profile for the borrowers and adjust the interest rate according to this. However, default risks may be very low in microfinance and therefore the APR stays nearly unchanged.	Rosenberg, R. (2002): Occasional Paper: Microcredit Interest Rates; Rosenberg, R. et al (2013): Microcredit Interest Rates and Their Determinants; Rosenberg, R. / Gonzalez, A. / Narain, S. (2009): Are Microcredit Interest Rates Excessive?; Cotler, P. / Almazan, D. (2013): The Lending Interest Rates in the Microfinance Sector: Searching for its Determinants; Walke, A. / Fullerton, E. / Tokle, R. (2018): Risk-based loan pricing consequences for credit unions
<b>Financed sector</b>	Lenders adjust the interest rates according to the specific sectors. However, only a few sectors like agricultural, manufacturing or services have an influence.	Arnold, I. / Kool, C. / Raabe, K. (2011): Industry Effects of Bank Lending in Germany
<b>Portfolio growth</b>	Rapid portfolio growth influences the estimate of loan losses. The higher the growth the higher the tendency to underestimate the risk.	Rosenberg, R. (2002): Occasional Paper: Microcredit Interest Rates
<b>Cost of fund borrowed</b>	Cost of funds is included in the formula of APR: Interest rate should cover the cost of deposits, as well as operating expenses and cost of funds. It means that higher is the cost of funds, higher will be the APR charged because the interest rate should cover it.	Rosenberg, R. (2002): Occasional Paper: Microcredit Interest Rates
<b>Saving mobilization</b>	Voluntary savings mobilization has not necessarily low costs of funding (and consequently low APR). However, loan size tends to be higher for institutions that offer a lot of voluntary saving services than for those institutions that offer a little or not at all this kind of services.	Rosenberg et al. (2013): Microcredit Interest Rates and Their Determinants Branch, B.; Klaehn, J. (2002): Striking the Balance in Microfinance: a practical guide to mobilizing savings, World Council of Credit Unions, Washington DC.

<p><b>Profitability</b></p>	<p>The level of profitability of MFIs impacts the level of APR and vice versa</p>	
<p><b>Inflation</b></p>	<p>Possibility to justify the higher APR (decreasing the purchasing power parity of a nation). 2 types of effects: - POSITIVE (**inflation rate stays below a certain level, and depending from the definition of microfinance clients). (1) possibility for the clients to rise the output price, leading to more profits; (2) the real amount of the debt (borrowed money) decreases. - NEGATIVE. (1) economic slowdown (companies' collapses), raise their credit ceilings keeping in mind the real value of the loan, and may be required to increase the loan instalment process by some months to ease the likely pressure on clients; (2) difference between lower output and the expected profits; (3) rising of funding costs. **The positive effect of microfinance is largest for moderate rates of inflation and drops substantially for inflation rates above the threshold.</p>	<p>Zaidi, S.A., Farooqi, M., Naseem, A. (2008) "The Impact of Inflation on Microfinance Clients and its Implications for Microfinance Practitioners" ---- Muller, A. (2013) "A General Equilibrium Analysis of Inflation and Microfinance in Developing Countries"</p>
<p><b>Lending rate</b></p>	<p>Increasing the APR (directly related to profitability of the MFIs). High lending rate is an MFI choice, one that is largely decided by its lending to poor people and small businesses, and not by hunt for higher profits (used to increase the profit margin).</p>	<p>Strom, R. O., Merslan, R. (2013) "Microfinance: Costs, Lending Rates, and Profitability"</p>
<p><b>Market development stage</b></p>	<p>Higher competition may lead to lower APR. One the one side competition increases and on the other side decreases interest rates. The demand is also connected to the market development stage and the risk may be higher in declining or not very well developed economies.</p>	<p>Cotler, P. / Almazan, D. (2013): The Lending Interest Rates in the Microfinance Sector: Searching for ist Determinants; Rosenberg, R. / Gonzalez, A. / Narain, S. (2009): Are Microcredit Interest Rates Excessive?; Hermes / Hudon (2018): Determinants of the Performance of Microfinance Institutions: A Systematic Review</p>
<p><b>Leverage</b></p>	<p>Poorly capitalized lenders may need to have higher interest rates while highly capitalized ones support losses and maybe reduce interest rates. The higher the leverage the higher will also be the risk exposure. Less leveraged MFI perform financially better and therefore can use lower interest rates.</p>	<p>Arnold, I. / Kool, C. / Raabe, K. (2011): Industry Effects of Bank Lending in Germany; Franco, G. / Hope, O. / Lu, H. (2017): Managerial ability and bank loan pricing; Hermes / Hudon (2018): Determinants of the Performance of Microfinance Institutions: A Systematic Review</p>



### Business development services

It is in general very costly to provide the poor with services (because they mostly live in rural areas and it is costly and time-consuming to reach them).  
Moreover, the poor are also less willing to pay for these services.

Armendáriz / Morduch (2010): The Economics of Microfinance. in: Meyer (2013): INVESTING IN MICROFINANCE: AN ANALYSIS OF FINANCIAL AND SOCIAL RETURNS  
Kahan (2007): Business services in support of farm enterprise development: a review of relevant experiences

### Legal Form of the MFIs

Larger MFIs have higher profits, higher returns, and higher operational self-sufficiency rates than smaller MFIs, indicating that MFI growth could enable consolidation in the microfinance market. For smaller MFIs the way to consolidate and improve the indicators could be through assimilating or merging with other MFIs. Non-bank financial institutions and rural banks are able to serve more customers and that cooperatives provide smaller loans, causing a bigger social impact, and that they obtain higher returns and profits. Legal forms may be the most appropriate for the microfinance market.

Araújo da Costa, R. R. (2017) "The relationship between the performance and legal form of microfinance institutions"