Capital structure in microfinance institutions

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Why is the capital structure in MFIs so different from regular banks?

Our question is spurred by a simple observation:

- $Equity/(E + Debt) \approx 40\%$ in MFIs our sample.
- ► E/(E + D) < 10% in ordinary banks Admati and Hellwig (2013): Close to 2% in investments banks before financial crisis.

So:

- Why this large difference?
- Specifically: Why is the equity share so high in MFIs, and is this share stable?

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The costs of monitoring hypothesis

Building upon the Holmström and Tirole (1997) model of a credit intermediary and participants having limited liability, we develop three sub-hypotheses:

- The MFI has lower leverage the higher the operating costs relative to revenue is.
- The MFI has lower leverage the greater the number of borrowers in its portfolio.
- ► The MFI has higher leverage the higher the average loan is.

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Further from Holmström and Tirole (1997) is that a third, independent party can issue some certificate that the entrepreneur is sound. Faulkender and Petersen (2006) find that companies with credit ratings have higher leverage.

- 1. MFIs with higher credit ratings have higher leverage.
- 2. A higher credit rating induces an MFI to further increase future leverage.

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The signalling hypothesis

An MFI characteristic can be interpreted as a signal within the Holmström and Tirole (1997) model. We have sub-hypotheses:

- A regulated MFI has a higher borrowing capacity than an unregulated, and therefore, a higher leverage. Merton (1977): Banks have an implicit government license to assume high leverage.
- 2. The leverage in an MFI founded by an international founder is higher or lower than an MFI founded locally.
- 3. The MFI's ownership type is an uncertain predictor of leverage.
- 4. The longer the MFI has been in the microfinance business, the higher is the *debt level*
- 5. The higher the MFI's *profitability*, the higher is the MFI's *debt level*

The money generating hypothesis

Why is high leverage (D/E) advantageous for financial institutions? DeAngelo and Stulz (2015):

Financial institutions are able to "create money" with more leverage, on condition that the country has a well-developed financial sector that allows banks to hedge their risks.

The hypothesis is:

 Microfinance institutions operating in developing countries have higher leverage the larger the extent of the domestic credit market.

Variable name Definition

Debt fraction	Debt((Equity + Debt)
Leverage	Debt/Equity
Rate grade	The rating agency's judgment of the MFI, ranging from 0 to 1
Cost of sales	Operating costs on the financial revenue of the portfolio
Credit clients	The number of credit clients
Average loan	The loan portfolio divided by the number of credit clients
Regulated	An indicator variable being 1 if the MFI is under regulations by a local banking authority
Int. founder	A binary variable being 1 if the MFI is founded by an international organisation

Variable name	Definition			
Ownership type	The MFI can be a bank, a non-bank financial i stitution, a non-governmental organisation (NGC a cooperative, a state bank or other, indicated binary variables			
MFI age	The years since the MFI started as a microfinance institution			
Risk	Portfolio at risk. Fraction more than 30 days over- due			
Profitability	Return on assets, calculated before extraordinary items			
Competition	The Lerner index			
Domestic credit	The fraction of total credit in a country that the indigenous MFIs supply			
Inflation	The annual change in the price level			
HDI	Human Development Index from the World Bank			

The Mersland Data set

- Independent rating agencies visit the MFI and make on-site evaluations.
- Data source used in e.g. Garmaise and Natividad (2013) from one rating agency. We have data from five rating agencies, and the data spans years up to the present. About 3,500 observations on 655 unique MFIs.
- The rating agency makes a report covering 3 to 4 last years. Then we know the MFI's rating score in the following years.

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The Mersland Data set Descriptives

Variable	Mean	St.dev	Min	Median	Max	Obs
Debt level	0.572	0.248	0.000	0.625	1.000	3184
Leverage	3.800	15.635	0.000	1.660	460.326	3177
Rate grade	0.551	0.185	0.000	0.546	1.000	1475
Cost of sales	0.790	0.461	0.047	0.680	4.690	3113
Credit clients	22915	53275	10	7635	1046062	3201
Average loan	954	1225	20	533	9689	3201
Regulated	0.376	0.484	0.000	0.000	1.000	3163
Int. founder	0.394	0.489	0.000	0.000	1.000	3172
MFI age	11.281	7.863	0.000	10.000	79.000	3193
Profitability	0.010	0.166	-1.739	0.018	3.059	3176
Competition	0.782	0.123	0.013	0.811	1.000	3111
Domestic credit	36.881	28.441	-8.051	31.347	195.938	3185
Inflation	0.077	0.082	-0.190	0.060	1.130	3194
HDI	0.592	0.152	0.000	0.632	0.877	3201

The near constancy of debt level



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The debt level difference between MFIs



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Category	Mean	St.dev.	CV	Min	Median	Max	Ν
Ownership type	е						
Bank	0.625	0.202	0.322	0.000	0.667	0.989	163
NBFI	0.601	0.244	0.406	0.000	0.676	1.000	1,033
NGO	0.550	0.246	0.447	0.000	0.590	1.000	1,433
Cooperative	0.563	0.267	0.474	0.000	0.625	0.988	509
State bank	0.547	0.298	0.545	0.052	0.546	0.997	23
Other	0.398	0.220	0.552	0.043	0.417	0.701	20
Regulated							
Not regulated	0.546	0.253	0.464	0.000	0.593	1.000	1,961
Regulated	0.613	0.233	0.381	0.000	0.681	0.995	1,187
<i>t</i> -test	-7.593***						
International fo	International founder						
Local	0.603	0.236	0.391	0.000	0.654	1.000	1,908
International	0.523	0.260	0.497	0.000	0.563	0.986	1,248
<i>t</i> -test	8.737***						
Total	0.572	0.248	0.434	0.000	0.624	1.000	3,181

Econometric methods

The dynamic GMM model:

$$y_{it} = \alpha y_{i,t-1} + \beta X_{i,t-1} + c_i + u_{it} \tag{1}$$

y Variable to be explained, here D/(E + D).

 $X_{i,t-1}$ The vector of independent variables

ci The unobservable firm-specific effect ("firm fixed effects")

*u*_{it} The idiosyncratic error

The relationship (1) is usually differenced:

$$\Delta y_{it} = \alpha \Delta y_{i,t-1} + \beta \Delta X_{i,t-1} + \Delta u_{it}$$
⁽²⁾

Differencing removes the c_i term. The two relationships (1) and (2) are commonly estimated as a system (Blundell and Bond, 1998)

However, most of the variation in the material is in the cross-section, between MFIs. Hence, we rely on straightforward panel regression methods.

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- ► We vary the variables we include as independent.
- ► We add year indicators as year fixed effects.
- We try Debt/Äquity as dependent variable.

Econometric results

	(1)	(2)	(3)	(4)	(5)
Rate grade		0.171***	0.017		0.162***
Cost of sales	-0.068**	-0.111***			-0.176***
Credit clients	0.038***	0.030***			0.024***
Average loan	0.081***	0.057**			0.039*
Regulated			0.077***	0.094***	0.060***
Int. founder			-0.039***	-0.057***	-0.039***
MFI age			0.037**	0.073***	0.011
Risk			-0.127**	-0.001	-0.105*
Profitability			-0.096	-0.060	-0.166
Competition			0.167*	0.125*	-0.107
Domestic credit	0.037**	0.036**	0.037***	0.026*	0.028*
Inflation	0.019	-0.020	0.006	0.034	-0.006
HDI	0.249**	0.106	-0.025	0.127	0.082
Constant	-0.141	-0.034	0.238*	0.099	0.322
Year indicators?	No	No	No	No	No

Conclusions

- Monitoring Clear evidence that *debt level* is associated with the MFI's monitoring effort
- Certification A higher rate grade gives the MFI an opportunity to increase its debt level
 - Signalling Being regulated by a local banking authority means a higher *debt level* for the MFI
- Financial market A deeper domestic financial market is associated with a higher MFI *debt level*

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