

Competitive Environment and Financial Stability in the Peruvian Microfinance System

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Agenda

- 1 Competition and stability
- 2 Competitive environment of the MFIs
 - The Peruvian financial system
 - Relevant market
- 3 Competition in the MFS
 - Regulatory changes
 - Dynamism of MFS
 - Signals of the increasingly competitive environment
 - Signals of lower stability
- 4 Literature review
 - Stability and competition
 - Stability and competition indicators
- 5 Results
 - Competition structure
 - Evolution of competition
 - Competition and stability
- 6 Concluding remarks

Competition and stability



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The Peruvian financial system

Structure of the Peruvian financial system, June 2017

	Number of institutions	Assets	
		Amount (US\$ millions)	%
Banks	17	108,568	81.5
Finance companies	11	3,785	2.8
Non-banking Microfinance Institutions	27	8,075	6.1
Municipal Savings and Loans Institutions (CM)	12	6,990	5.2
Rural Savings and Loans Institutions (CRAC)	6	470	0.4
Micro-enterprise Development Entities (EDPYME)	9	615	0.5
State-owned companies	3	12,712	9.5
Banco de la Nación	1	8,269	6.2
Corporación Financiera de Desarrollo (Cofide)	1	3,942	3.0
Banco Agropecuario (Agrobanco)	1	500	0.4
Financial leasing companies	2	85	0.1
SUPERVISED FINANCIAL INSTITUTIONS	60	133,224	100.0

Source: SBS

Competitive environment of the MFIs

The MFIs

Relevant market: MFIs

	Types of institution	Number of institutions	MSE loans (%) 2003 - 2016
Commercial banks	1 bank	1	78
Deposit taking	12 CMs, 11 CRACs and 6 financial companies	29	67
Non-deposit taking	9 EDPYMEs	9	80

How to define the relevant market?

- **Product:** micro loans, small loans y consumption loans.
- **Criteria to identify competitors:** Maximum threshold for average loan ($\mu_{cp} + \sigma_{cp}$) and minimum threshold for lending interest rate ($\mu_i - \sigma_i$).

Relevant market: Non-MFIs

	Types of institution	Number of institutions
Commercial banks	8 banks	8
Deposit taking	2 CMs, 3 CRACs and 4 financial companies	9
Non-deposit taking	2 EDPYMEs	2

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Level playing field in the financial market:

- Allowing MFIs to open branches nationwide, beyond their original regional domains (2002).
- Authorizing MFIs to perform a wider range of operations (2008).

Promotion of information transparency in the financial market:

- Ensuring full disclosure of information about financial services and effective costs, promoting transparency and fairness in the contractual process (2002).
- Since 2004, the SBS's credit bureau has revealed information about performing borrowers in addition to the former practice of sharing information about the non-performing ones.

It has observed a dynamism in the microfinance market, through:

Downscaling

Incursion of some commercial banks in the microfinance market, motivated by the attractive profitability showed by MFIs.

Upgrading, mergers and acquisitions

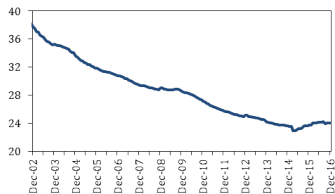
Growing strategies to achieve better market positioning.

Competition in the MFS

Some indicators may be interpreted as signals of the increasingly competitive environment for MFIs:

- Reduction of lending interest rates charged by MFIs.
- The increasing number of financial intermediaries in every Peruvian region.

MFS: Evolution of the lending interest rate*
(In percentage)



* Average implicit rates.

Source: SBS

Number of financial institutions by region
(Only includes the relevant market)

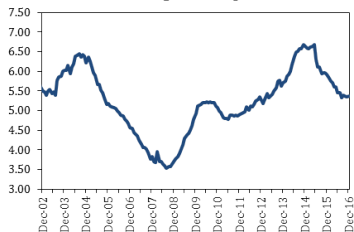
Region	Dec-02	Dec-16	Region	Dec-02	Dec-16
Amazonas	-	11	Lambayeque	11	27
Ancash	6	27	Lima	19	37
Apurímac	6	14	Loreto	4	17
Arequipa	11	32	Madre de Dios	2	9
Ayacucho	6	18	Moquegua	4	14
Cajamarca	7	24	Pasco	2	11
Callao	6	24	Piura	10	27
Cusco	6	27	Puno	6	25
Huancavelica	2	9	San Martín	5	20
Huánuco	2	18	Tacna	4	19
Ica	9	28	Tumbes	4	15
Junín	6	28	Ucayali	4	18
La Libertad	9	31	National	49	43

Source: SBS

Competition in the MFS

The decline in the main financial indicators is signal of lower stability.

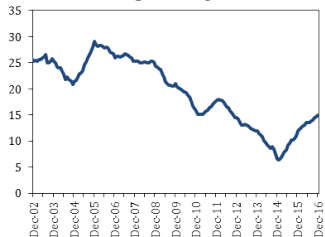
MFS: Evolution of past-due loans*
(In percentage)



* Seasonal adjustment.

Source: SBS

MFS: Evolution of the return on equity
(In percentage)



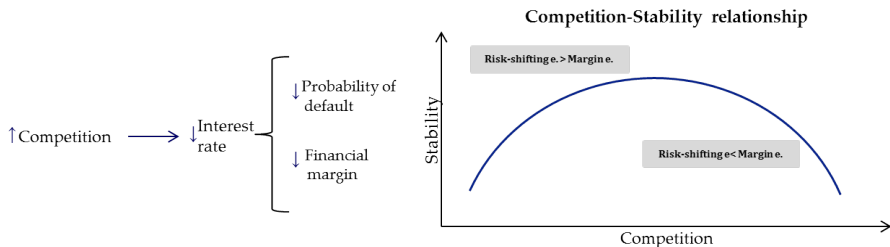
Fuente: SBS

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The relationship between competition and stability has been studied through the following methodologies:

- **Competition-fragility:** Higher competition is associated with higher risks and hence more fragility.
- **Competition-stability:** Banks are riskier in more concentrated markets.
- **Martínez-Miera y Repullo (2010):** Both scenarios are possible, considering the dual impact of changes in the interest rate (risk-shifting effect and margin effect).



Source: Martínez-Miera and Repullo (2010)

The following indicators are proxy for competition and stability:

Stability

Z-score:

$$Z = \frac{\overline{ROA} + C/A}{\sigma_{ROA}}$$

Competition

- **Boone indicator:**

$$\ln s = \alpha + \beta \ln CMg$$

- **Panzar and Rosse H-statistic:**

$$\ln P = \beta_0 + \beta_1 \ln w_1 + \beta_2 \ln w_2 + \beta_3 \ln w_3 + \beta_4 \ln w_4$$

$$H = \sum \frac{w_{j,it}}{P_{it}} \frac{\partial P_{it}}{\partial w_{j,it}} = \sum \frac{\partial \ln P_{it}}{\partial \ln w_{j,it}} = \beta_1 + \beta_2 + \beta_3 + \beta_4$$

Marginal cost should be estimated to determine the Boone indicator. Hence, we use a translog cost function:

$$\begin{aligned} \ln C_{it} = & \beta_0 + \sum_{k=1}^4 \beta_k \ln w_{k,it} + \beta_5 \ln y_{it} + \frac{1}{2} \sum_{k=1}^4 \sum_{j=1}^4 \delta_{kj} \ln w_{k,it} \ln w_{j,it} + \frac{1}{2} \delta_{55} \ln^2 y_{it} + \\ & \sum_{k=1}^4 \delta_{k5} \ln w_{k,it} \ln y_{it} + \theta_1 \ln Trend + \theta_2 \ln^2 Trend + Non - MFI + \varepsilon_{it} \end{aligned}$$

Symmetry and linearity constraints:

$$\delta_{kj} = \delta_{jk}; \sum_{k=1}^4 \beta_k = 1; \sum_{k=1}^4 \delta_{kj} = 0; \sum_{k=1}^4 \delta_{k5} = 0$$

$$MC_{it} = \frac{C_{it}}{y_{it}} (\beta_5 + \delta_{55} \ln y_{it} + \delta_{15} \ln w_{1,it} + \delta_{25} \ln w_{2,it} + \delta_{35} \ln w_{3,it} + \delta_{45} \ln w_{4,it})$$

Estimating the relationship between competition and stability:

Stability = F(Competition, Competition², control variables)

$$Z_{it} = \beta_0 + \beta_1 \text{Competition}_t + \beta_2 \text{Competition}_t^2 + \beta_3 \text{GDP}_t + \beta_4 \text{Inflation rate}_t + \beta_5 \text{MFI asset size}_{it} + \beta_6 \text{Specialization}_{it} + \beta_7 \text{Credit risk}_{it} + \beta_8 \text{Liquidity risk}_{it} + \beta_9 \text{Efficiency}_{it} + \varepsilon_{it}$$

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Competition: The market structure that best fits the microfinance system is monopolistic competition.

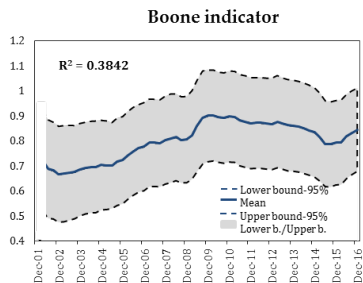
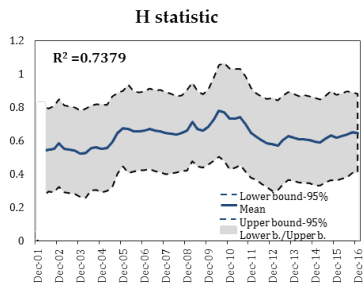
Variable	Coefficients
Ln (lab) β_1	0.375*** (0.0321)
Ln (fund) β_2	0.313*** (0.0253)
Ln (cap) β_3	0.0672** (0.0298)
Ln (prov) β_4	0.0086*** (0.00300)
Ln(exchange rate)	-0.126 (0.170)
Ln(interbank int. rate)	-0.0292 (0.0228)
Ln (capital/asset)	0.0527** (0.0213)
Constant	1.589*** (0.112)
N° observations	8,334
R ²	0.7525

$$H = \beta_1 + \beta_2 + \beta_3 + \beta_4 = 0.764$$

Robust standard errors in parentheses.

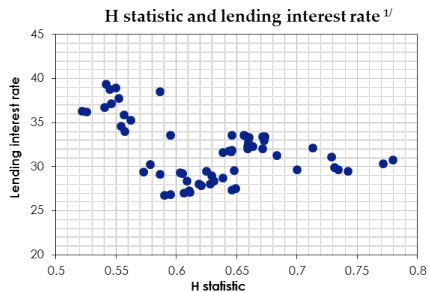
*** p<0.01, ** p<0.05, * p<0.1

Evolution of Competition: Both the H-statistic and the Boone indicator suggest an increasing competition in the MFS during 2003-2010; followed by less competitive pressures up to 2014. Then, competition has showed a declining trend since 2015.

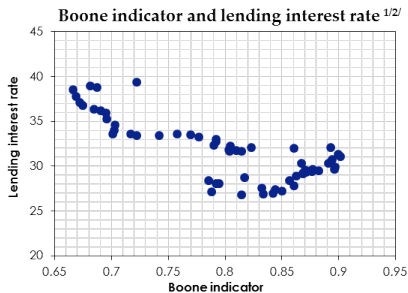


Results

The estimated competition indicators reflects reality, that is why competition indicators are negatively associated with the average lending interest rate.



^{1/}Quarterly lending interest rate.



^{1/}Quarterly lending interest rate.

^{2/}Negative of Boone indicator.

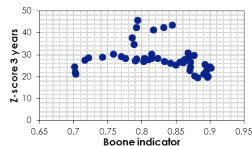
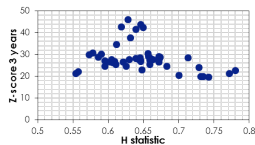
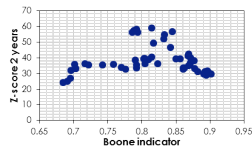
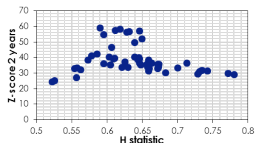
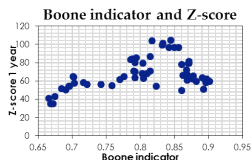
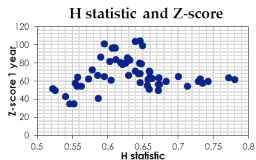
There is a non-linear relationship between competition and stability. Additionally, it is highlighted the importance of economies of scale, credit risk, liquidity risk and efficiency.

Variable	H-statistic			Boone indicator		
	Z ₁	Z ₂	Z ₃	Z ₁	Z ₂	Z ₃
Competition	814.6** (379.5)	717.2*** (257.4)	823.3*** (303.9)	1479** (571.4)	1267** (475.7)	1244*** (342.7)
Competition ²	-690.8** (288.8)	-596.8*** (197.0)	-651.3*** (231.4)	-992.5*** (347.0)	-850.7*** (296.6)	-812.2*** (215.5)
Size Ln(assets)	10.69*** (2.276)	4.268*** (1.274)	2.011* (1.046)	14.04*** (3.422)	8.208*** (1.481)	4.343*** (0.744)
Specialization (SME loans/total loans)	0.19 (0.128)	0.0661 (0.0623)	0.068* (0.0375)	0.232* (0.121)	0.111* (0.0654)	0.103** (0.0388)
Credit risk (past-due loans ratio)	-1.585*** (0.341)	-0.909*** (0.166)	-0.662*** (0.160)	-1.601*** (0.350)	-0.982*** (0.200)	-0.777*** (0.156)
Liquidity risk (liquidity ratio)	-0.0049*** (0.00127)	-0.0022* (0.00113)	-0.0008 (0.000783)	-0.0046*** (0.00133)	-0.0019* (0.00113)	-0.0005 (0.000806)
Efficiency (-Labour expenses/total loans)	1.139*** (0.231)	0.455*** (0.103)	0.217*** (0.0547)	1.037*** (0.229)	0.378*** (0.0986)	0.17*** (0.0501)
GDP	1.917 (140.9)	-19.37 (95.84)	48.86 (56.09)	26.53 (157.3)	51.27 (92.35)	121.5** (51.64)
Inflation rate	174.7 (307.9)	-7.453 (171.7)	-226.4** (111.2)	173.2 (316.2)	-41.91 (158.6)	-268.3*** (93.36)
Constant	-353.9*** (129.4)	-245.9*** (87.84)	-264.8** (112.9)	-728.3*** (205.2)	-576.9*** (181.8)	-525.2*** (141.5)
N° observations	1,837	1,683	1,533	1,837	1,683	1,533
Adjusted R ²	0.101	0.0799	0.0571	0.105	0.0958	0.0806
F-Test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Robust standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Inverted U-shaped relationship between competition and stability.



* Quarterly average Z-score.

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Concluding remarks

- The market structure that best fits the Peruvian MFS is monopolistic competition.
- The competition that MFIs face rises during 2003-2010; showing less competitive pressures up to 2014. Then, competition has showed an increasing trend since 2015.
- There is an inverted U-shaped relationship between competition and stability for MFIs during 2002-2016.
- On the regulatory-side: policies should maintain a balance between fostering competition (to improve financial inclusion and efficiency) and preserving stability.

- On the MFIs-side: (i) develop or improve an active customer relationship management; improve their screening processes that effectively take into account their customers' willingness to pay; and expand their scope into unserved markets; (ii) enhance credit risk, liquidity risk and efficiency management, because they are key instruments to achieve financial stability.
- SBS, financial institutions and other agents: financial literacy campaigns emphasizing in responsible management of personal finance, to help reduce delinquent borrowers and, consequently, to improve the MFIs stability.

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