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# Can Microfinance (Still) Reduce Portfolio Volatility?

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# Empirical analysis of 1998 to 2006 data of 325 leading MFIs suggests that microfinance can reduce portfolio volatility

Simplified illustration

	Correlation with Global Capital Markets		Correlation with Domestic Economy	
<b>Net operating income</b>	<b>S&amp;P 500 Equity Index</b>	-10%	<b>Domestic GDP</b>	-5%
	<b>Emerging Market Institutions</b>	-6%	<b>Emerging Market Institutions</b>	-19%
	<b>Emerging Market Commercial Banks</b>	-3%	<b>Emerging Market Commercial Banks</b>	-14%
	<b>Microfinance institutions</b>	No correlation found	<b>Microfinance institutions</b>	No correlation found
<b>Portfolio at Risk (&gt;30 days)</b>	<b>Emerging Market Commercial Banks</b>	+1%	<b>Emerging Market Commercial Banks</b>	+2.1%
	<b>Microfinance institutions</b>	No correlation found	<b>Microfinance institutions</b>	+1.4%

# Key results and conclusions

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## Key results

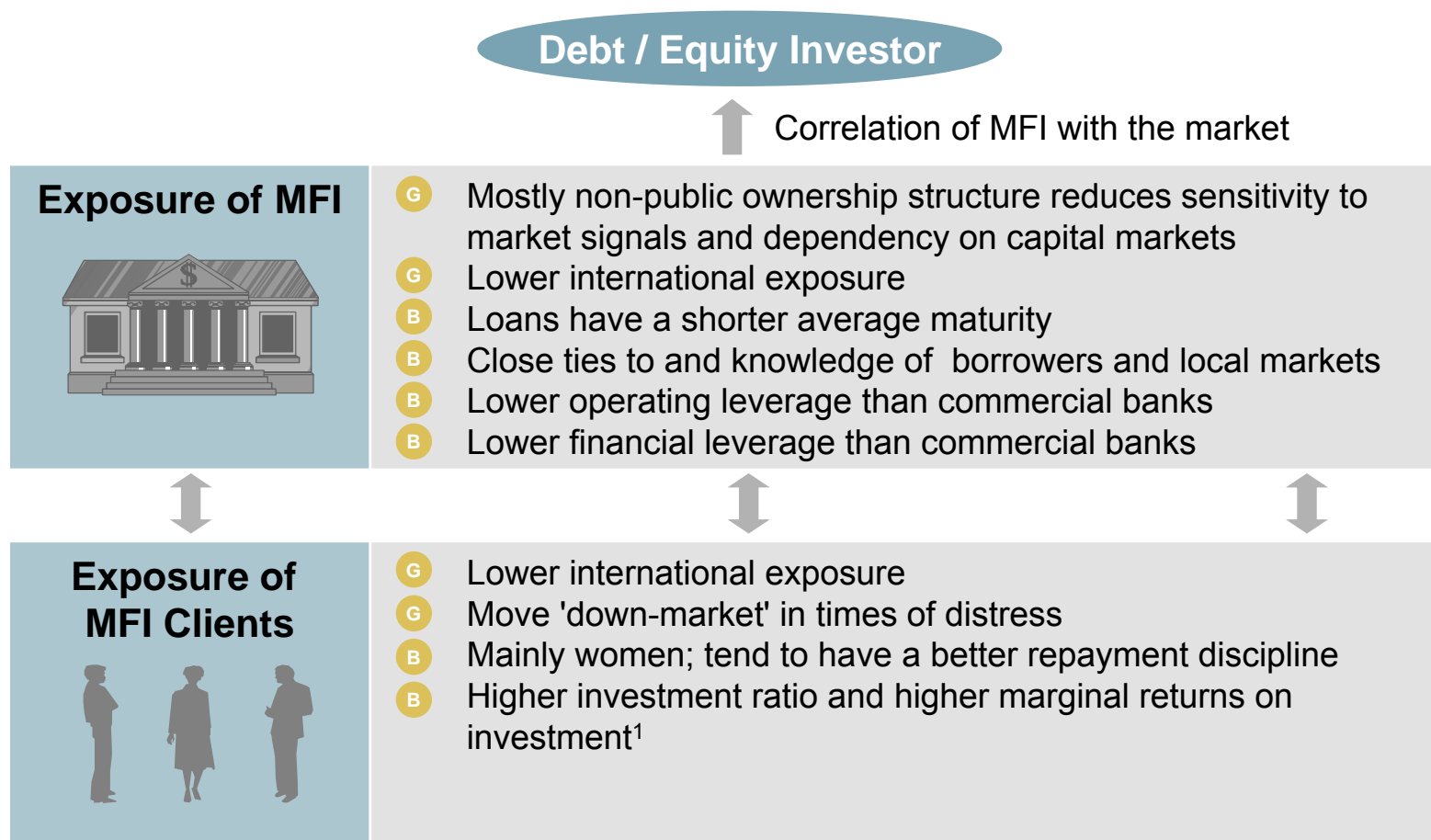
- MFIs display virtually no correlation with global capital markets
- MFIs display significant correlation with the domestic economy, however seem to be less exposed to the domestic economy than other types of institutions

## Conclusions

- Microfinance not a miracle – no negative or zero correlation
- Microfinance should be able reduce portfolio volatility for international portfolio investors with the ability to diversify country risk
- No significant portfolio diversification value for domestic emerging market investors without the ability to diversify country risk

Paper can be downloaded at  
[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=943786](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=943786)

# Why microfinance may be less exposed to market risk

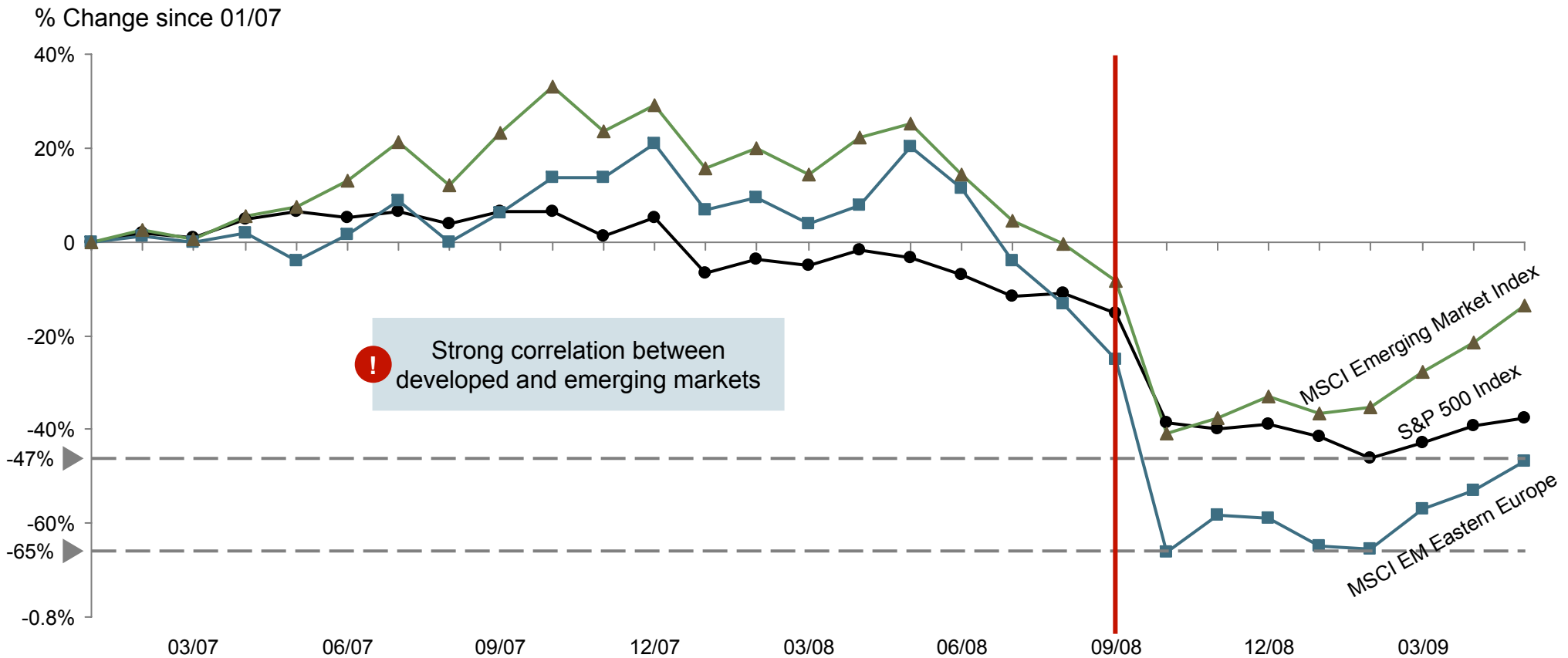


**Any mission drift is likely to increase systemic risk  
As microfinance industry matures market risk will increase**

**G** Characteristic providing advantage towards other EM corporations in general    **B** Characteristic providing advantage towards EM commercial banks

1. According to CGAP, studies covering India, Kenya, and the Philippines found an avg. annual ROI by microbusinesses ranged from 117 to 847 percent

# Additionally, since September 2008 the world has changed



1. Do findings hold true as industry has matured?
2. Do findings hold true in light of the current financial crisis?

# We don't know yet – however, differentiating factors & current qualitative evidence indicate cont. resilience of microfinance

## Many differentiating factors will persist for true entrepreneurial microfinance

### Exposure of MFIs

- ✗ Mostly non-public ownership structure
- ✗ Lower international exposure
- ✗ Close ties to and knowledge of borrowers and local markets
- ✗ Lower financial leverage than commercial banks
- ✓ Lower operating leverage than commercial banks
- ✓ Loans have a shorter average maturity

### Exposure of MFI clients

- ✓ Lower international exposure
- ✓ Move 'down-market' in times of distress
- ✓ Higher investment ratio and higher marginal ROI
- ✓ Mainly women; tend to have a better repayment discipline

## Qualitative evidence on top tier MFIs

Worldwide – while growth has stopped – size of MFI assets and loan portfolio has been relatively stable

However, some deposit taking institutions witnessed deposit outflows, which most of them countered by shrinking their loan portfolio

While MFIs find it more difficult to obtain funding, few are insolvent

Many MFI clients have been hit hard and experience more problems of repaying their (foreign-denominated) debt

However, overall PAR levels seems stable<sup>1</sup>. Some funds report increases of in PAR by some MFIs of 3%-5%

**As a result, most microfinance investment funds experience impressively uncorrelated returns compared to the rest of the market**

**New empirical analysis of ~100 MFIs with monthly data from 2007 and 2008 will hopefully confirm this**

- ✗ Factor at risk of converging towards traditional banking as industry matures
- ✓ Factor that will most likely remain differentiating factor as industry matures

1. Symbiotics 50 benchmark, which tracks large MFIs worldwide, denotes no major changes in terms of profitability or risk (Symbiotics 2009)

# Appendix

# Approaches to measuring market risk

## Historical Market Beta

Standard approach of est. correlation of a listed asset/asset class

- Regress the returns of an asset class over a certain period of time against the returns of a benchmark index
- Impossible with microfinance, since not enough listed MFIs

## Fundamental Beta

Standard approach of est. correlation of an unlisted asset/asset class

- Analyze the types of businesses in which a firm operates, identify publicly traded firms in these businesses, and obtain their regression betas as a proxy
- Impossible with microfinance, as no comparable listed peer group

## Accounting Beta

Possible approach of est. correlation of an unlisted asset/asset class with no comparable listed peer group

- Changes in earnings of a firm, can be related to changes in earnings of the market over a comparable period
- Approach suffers from biases due to earnings-smoothing and can be influenced by non-operating factors such as changes in depreciation or inventory valuation and by allocation of corporate expenses at the divisional level

**Accounting Beta currently only possible approach for microfinance**

# Minimizing the shortcomings of accounting data

- 1 Accounting Beta**
  - Net Operating Income (NOI)
- 2 Fundamentals**
  - Profitability Indicators
    - Return of Equity (ROE)
    - Profit Margin
  - Asset Growth Indicators
    - $\Delta$  Total Assets
    - $\Delta$  Gross Loan Portfolio
  - Asset Quality Indicator
    - Portfolio at Risk (PAR 30)
- 3 Emerging market institutions and emerging market commercial banks as a benchmark**

**Additionally maximize data quality**

# Description of dataset

## Annual data from 1998-2006

### Sample:

- 325 leading<sup>1</sup> MFIs (75% audited) based in 65 emerging market economies (source: Micro Banking Bulletin)
- 325 leading<sup>2</sup> emerging market firms based in 23 EM countries (source: ORBIS)
- 325 leading<sup>2</sup> emerging market commercial banks based in 49 EM countries (source: BankScope)

**Proxies for global markets:** S&P 500, MSCI World Index and MSCI EM Index (source: Bloomberg)

**Proxy for domestic economy:** GDP % change (source: Economist Intelligence Unit)

Dependent Variables	Top 325 MFIs				Top 325 Emerging Market Institutions				Top 325 Emerging Market Commercial			
	# Obs.	# Inst.	Median	Std. Dev.	# Obs.	# Inst.	Median	Std. Dev.	# Obs.	# Inst.	Median	Std. Dev.
Net operating Income % change	786	312	28.5%	145%	1908	314	17.4%	88%	1591	325	21.9%	61%
Return on Equity	1475	325	5.8%	27%	2183	314	15.8%	17%	1920	325	16.3%	20%
Profit Margin	1482	325	8.2%	33%	2314	325	12.7%	18%	1920	325	13.2%	16%
Total Assets % change	1161	325	32.7%	35%	1968	314	9.1%	28%	1594	325	19.8%	33%
Loan Portfolio % change	1169	325	36.9%	44%	N/A	N/A	N/A	N/A	1589	325	26.0%	40%
Portfolio at Risk %	1406	321	2.5%	5%	N/A	N/A	N/A	N/A	1483	281	5.4%	8%

All numbers and ratios used are calculated from U.S. dollar conversion of local currency financial information

- (1) assuming that MFIs with the highest reporting standards represent - in terms of earnings - the leading institutions  
 (2) in terms of 2006 earnings

# Correlation with S&P 500 Index

	Top 325 MFIs	Top 325 EMIs	MFIs vs. EMIs	Top 325 EMCBs	MFIs vs. EMCBs
NOI % change (Accounting beta)	Coefficient: -.72 (-1.33) r-sq: 0.0034	Coefficient: .58 (3.62) <sup>***</sup> r-sq: 0.0080	Coefficient: 1.30 (3.02) <sup>**</sup> r-sq: 0.0058	Coefficient: .28 (2.48) <sup>*</sup> r-sq: 0.0048	Coefficient: 1.00 (2.59) <sup>**</sup> r-sq: 0.0028
ROE	Coefficient: .02 (0.58) r-sq: 0.0003	Coefficient: .06 (3.54) <sup>***</sup> r-sq: 0.0067	Coefficient: .04 (1.17) r-sq: 0.0035	Coefficient: .15 (6.09) <sup>***</sup> r-sq: 0.0227	Coefficient: .13 (3.02) <sup>**</sup> r-sq: 0.0129
Profit Margin	Coefficient: .05 (1.06) r-sq: 0.0010	Coefficient: .12 (6.84) <sup>***</sup> r-sq: 0.0230	Coefficient: .07 (1.74) r-sq: 0.0099	Coefficient: .19 (10.13) <sup>***</sup> r-sq: 0.0605	Coefficient: .14 (3.32) <sup>***</sup> r-sq: 0.0209
Total Assets % change	Coefficient: .00 (0.02) r-sq: 0.0000	Coefficient: .37 (10.39) <sup>***</sup> r-sq: 0.0613	Coefficient: .37 (5.10) <sup>***</sup> r-sq: 0.0376	Coefficient: .47 (10.76) <sup>***</sup> r-sq: 0.0837	Coefficient: .46 (5.85) <sup>***</sup> r-sq: 0.0496
Gross Loan Portfolio % change	Coefficient: .08 (0.89) r-sq: 0.0009	N/A	N/A	Coefficient: .48 (8.76) <sup>***</sup> r-sq: 0.0573	Coefficient: .41 (4.07) <sup>***</sup> r-sq: 0.0340
PAR 30	Coefficient: .01 (1.57) r-sq: 0.0023	N/A	N/A	Coefficient: -.09 (-10.43) <sup>***</sup> r-sq: 0.0830	Coefficient: -.10 (-8.49) <sup>***</sup> r-sq: 0.0592

\* = 95% level of confidence    \*\*\* = 99% level of confidence    \*\*\* = 99.9% level of confidence

# Correlation with MSCI World Index

	Top 325 MFIs	Top 325 EMIs	MFIs vs. EMIs	Top 325 EMCBs	MFIs vs. EMCBs
NOI % change (Accounting beta)	Coefficient: -.82 (-1.53) r-sq: 0.0045	Coefficient: .51 (3.43) <sup>***</sup> r-sq: 0.0072	Coefficient: 1.33 (3.16) <sup>**</sup> r-sq: 0.0059	Coefficient: .28 (2.53) <sup>*</sup> r-sq: 0.0050	Coefficient: 1.10 (2.89) <sup>**</sup> r-sq: 0.0022
ROE	Coefficient: .04 (1.06) r-sq: 0.0010	Coefficient: .09 (5.17) <sup>***</sup> r-sq: 0.0141	Coefficient: .05 (1.42) r-sq: 0.0076	Coefficient: .17 (7.28) <sup>***</sup> r-sq: 0.0322	Coefficient: .13 (3.14) <sup>**</sup> r-sq: 0.0186
Profit Margin	Coefficient: .10 (2.18) <sup>*</sup> r-sq: 0.0041	Coefficient: .14 (8.46) <sup>***</sup> r-sq: 0.0348	Coefficient: .04 (1.08) r-sq: 0.0166	Coefficient: .21 (11.97) <sup>***</sup> r-sq: 0.0825	Coefficient: .12 (2.71) <sup>**</sup> r-sq: 0.0303
Total Assets % change	Coefficient: -.05 (-0.76) r-sq: 0.0007	Coefficient: .34 (10.31) <sup>***</sup> r-sq: 0.0605	Coefficient: .40 (5.57) <sup>***</sup> r-sq: 0.0373	Coefficient: .44 (10.60) <sup>***</sup> r-sq: 0.0814	Coefficient: .50 (6.35) <sup>***</sup> r-sq: 0.0485
Gross Loan Portfolio % change	Coefficient: .01 (0.07) r-sq: 0.0000	N/A	N/A	Coefficient: .49 (9.34) <sup>***</sup> r-sq: 0.0646	Coefficient: .49 (4.99) <sup>***</sup> r-sq: 0.0379
PAR 30	Coefficient: .01 (0.87) r-sq: 0.0007	N/A	N/A	Coefficient: -.10 (-12.48) <sup>***</sup> r-sq: 0.1148	Coefficient: -.11 (-9.21) <sup>***</sup> r-sq: 0.0812

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# Correlation with MSCI Emerging Markets Index

	Top 325 MFIs	Top 325 EMIs	MFIs vs. EMIs	Top 325 EMCBs	MFIs vs. EMCBs
NOI % change (Accounting beta)	Coefficient: -.27 (-0.68) r-sq: 0.0009	Coefficient: .19 (1.96)* r-sq: 0.0024	Coefficient: .46 (1.50) r-sq: 0.0017	Coefficient: .31 (2.97)** r-sq: 0.0069	Coefficient: .59 (1.94) r-sq: 0.0025
ROE	Coefficient: .03 (1.46) r-sq: 0.0018	Coefficient: .04 (3.85)*** r-sq: 0.0079	Coefficient: .01 (0.34) r-sq: 0.0049	Coefficient: .10 (5.60)*** r-sq: 0.0193	Coefficient: .07 (2.37)* r-sq: 0.0117
Profit Margin	Coefficient: .04 (1.51) r-sq: 0.0020	Coefficient: .05 (4.43)*** r-sq: 0.0098	Coefficient: .00 (0.09) r-sq: 0.0051	Coefficient: .14 (9.78)*** r-sq: 0.0566	Coefficient: .09 (3.20)** r-sq: 0.0203
Total Assets % change	Coefficient: -.06 (-1.32) r-sq: 0.0021	Coefficient: .12 (5.47)*** r-sq: 0.0178	Coefficient: .18 (3.75)*** r-sq: 0.0117	Coefficient: .37 (9.03)*** r-sq: 0.0605	Coefficient: .43 (7.09)*** r-sq: 0.0367
Gross Loan Portfolio % change	Coefficient: -.05 (-0.84) r-sq: 0.0008	N/A	N/A	Coefficient: .40 (7.69)*** r-sq: 0.0447	Coefficient: .45 (5.84)*** r-sq: 0.0266
PAR 30	Coefficient: .00 (0.22) r-sq: 0.0000	N/A	N/A	Coefficient: -.07 (-10.60)*** r-sq: 0.0856	Coefficient: -.07 (-8.33)*** r-sq: 0.0604

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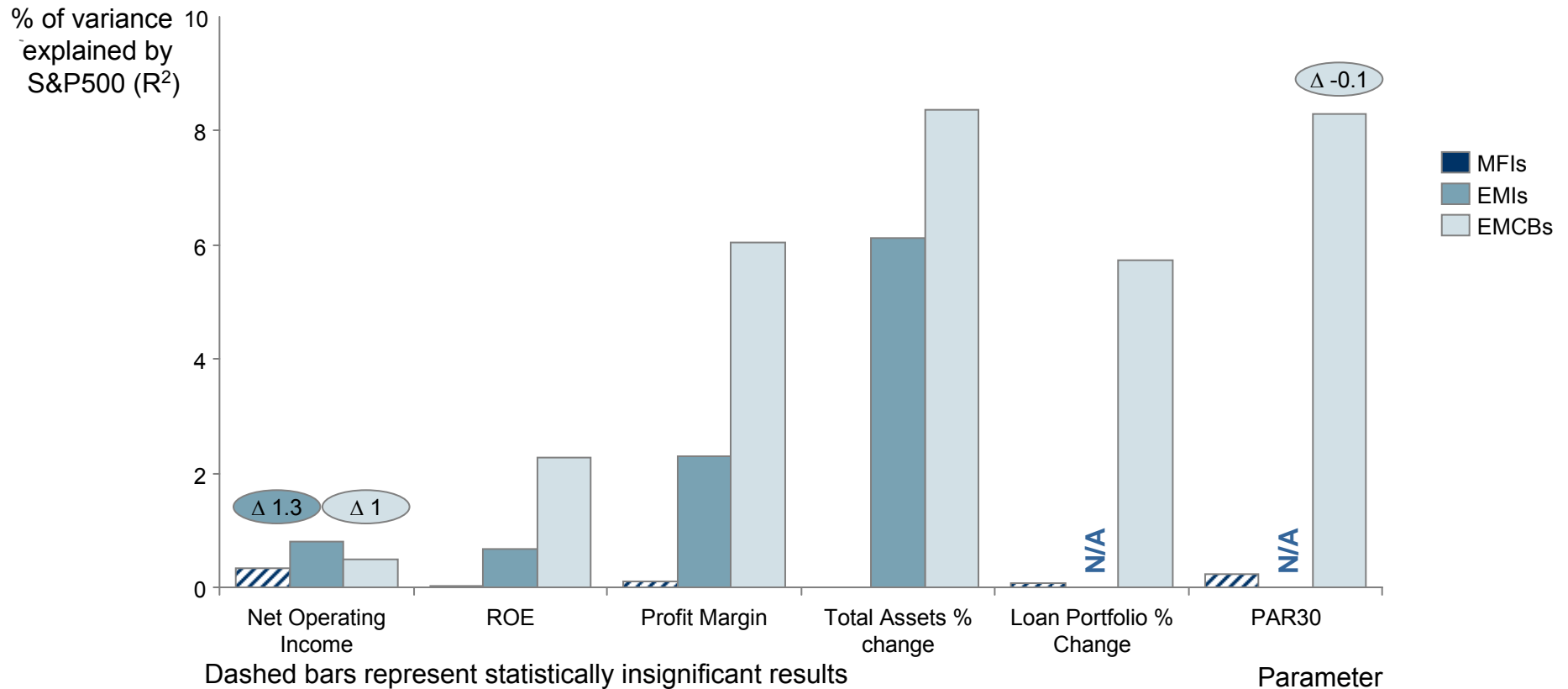
# Correlation with Domestic GDP

	Top 325 MFIs	Top 325 EMIs	MFIs vs. EMIs	Top 325 EMCBs	MFIs vs. EMCBs
NOI % change (Accounting beta)	Coefficient: -1.13 (-0.25) r-sq: 0.0002	Coefficient: 3.78 (3.30) <sup>***</sup> r-sq: 0.0068	Coefficient: 4.91 (1.44) r-sq: 0.0001	Coefficient: 2.87 (4.13) <sup>***</sup> r-sq: 0.0144	Coefficient: 3.99 (1.36) r-sq: 0.0021
ROE	Coefficient: .98 (4.42) <sup>***</sup> r-sq: 0.0191	Coefficient: 1.16 (9.25) <sup>***</sup> r-sq: 0.0451	Coefficient: .18 (0.77) r-sq: 0.0332	Coefficient: 1.21 (7.93) <sup>***</sup> r-sq: 0.0407	Coefficient: .23 (0.87) r-sq: 0.0320
Profit Margin	Coefficient: 2.07 (7.65) <sup>***</sup> r-sq: 0.0548	Coefficient: 1.27 (10.91) <sup>***</sup> r-sq: 0.0580	Coefficient: -.81 (-3.16) <sup>**</sup> r-sq: 0.0562	Coefficient: 1.00 (8.65) <sup>***</sup> r-sq: 0.0480	Coefficient: -1.07 (-4.08) <sup>***</sup> r-sq: 0.0523
Total Assets % change	Coefficient: 1.34 (2.82) <sup>**</sup> r-sq: 0.0110	Coefficient: 1.91 (7.33) <sup>***</sup> r-sq: 0.0323	Coefficient: 0.57 (1.08) r-sq: 0.0252	Coefficient: 1.62 (5.94) <sup>***</sup> r-sq: 0.0294	Coefficient: 0.28 (0.50) r-sq: 0.0228
Gross Loan Portfolio % change	Coefficient: 1.94 (3.25) <sup>**</sup> r-sq: 0.0146	N/A	N/A	Coefficient: 3.14 (9.67) <sup>***</sup> r-sq: 0.0747	Coefficient: 1.2 (1.78) r-sq: 0.0522
PAR 30	Coefficient: -.27 (-6.16) <sup>***</sup> r-sq: 0.0388	N/A	N/A	Coefficient: -.42 (-9.21) <sup>***</sup> r-sq: 0.0707	Coefficient: -.15 (-2.23) <sup>*</sup> r-sq: 0.0616

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# MFIs without significant exposure to global capital markets

## Correlations with S&P 500 index across metrics

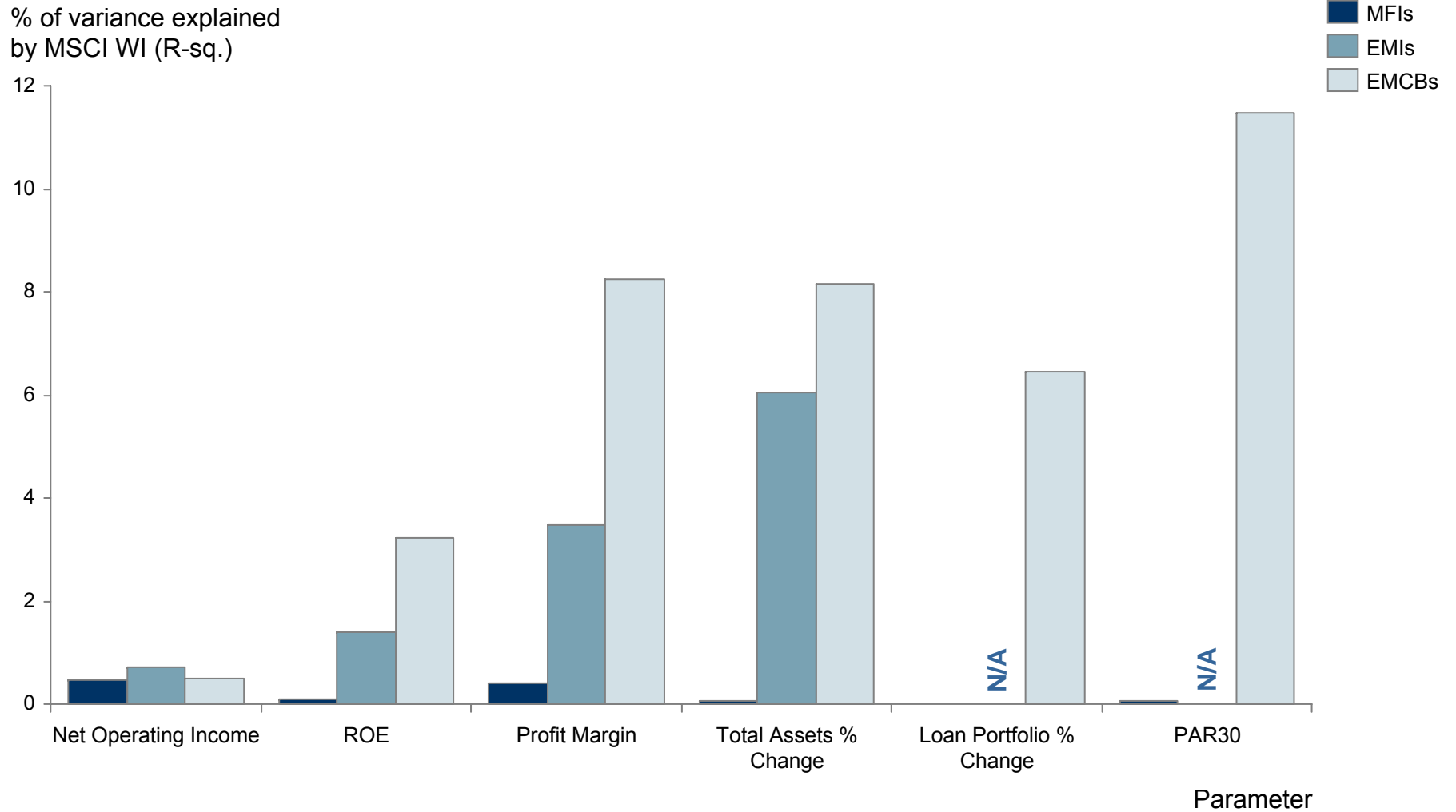


- **MFIs:** Consistently insignificant correlation
- **EMIs and EMCBs:** Consistently highly significant correlation
- **MFIs vs. EMIs:** MFIs significantly less correlation regarding NOI and Total Assets
- **MFIs vs. EMCBs:** MFIs consistently significantly less correlation than EMCBs

○ Difference in beta coefficient

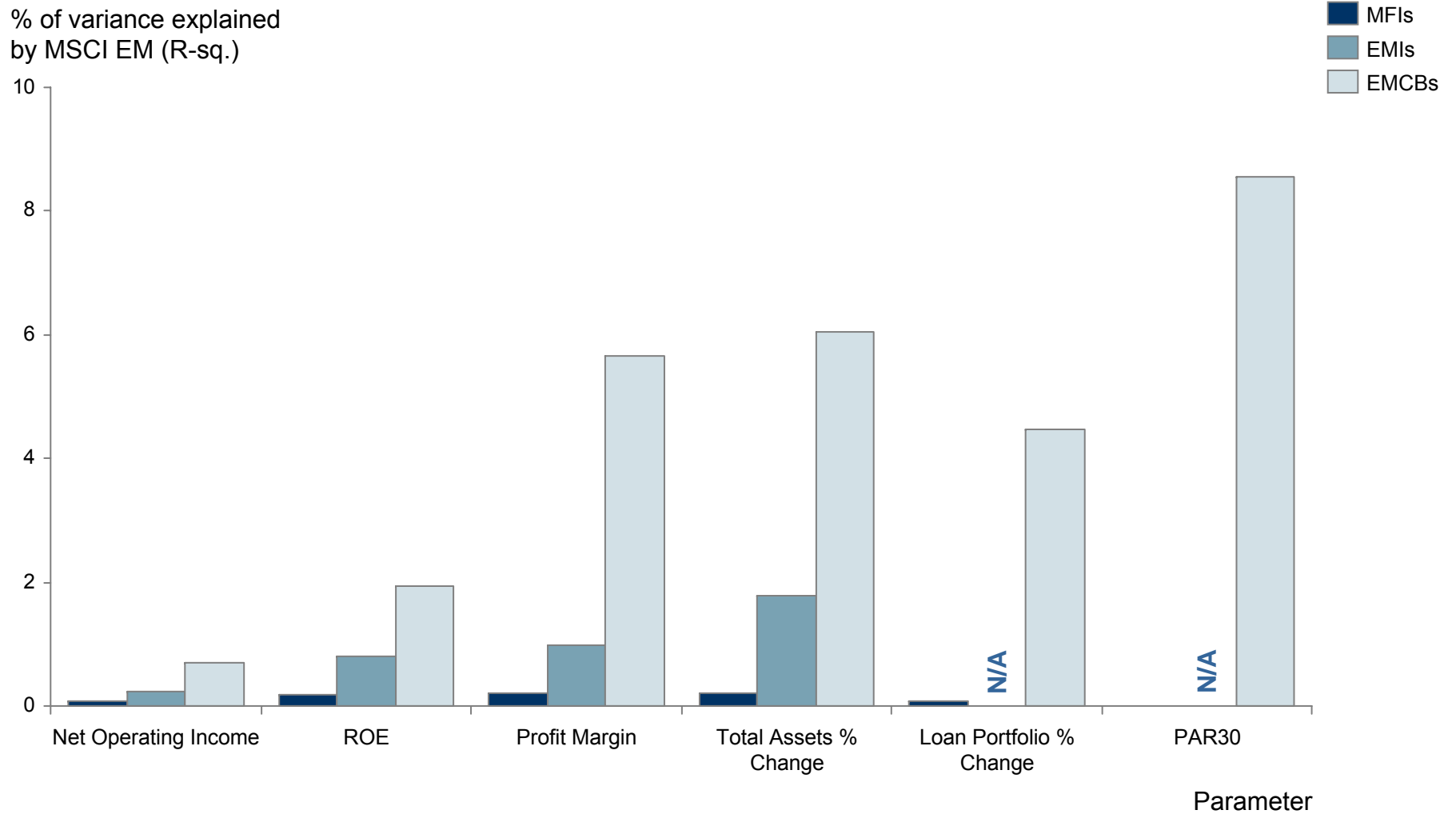
# MFIs without significant exposure to global capital markets

## Correlations with MSCI World Index across metrics



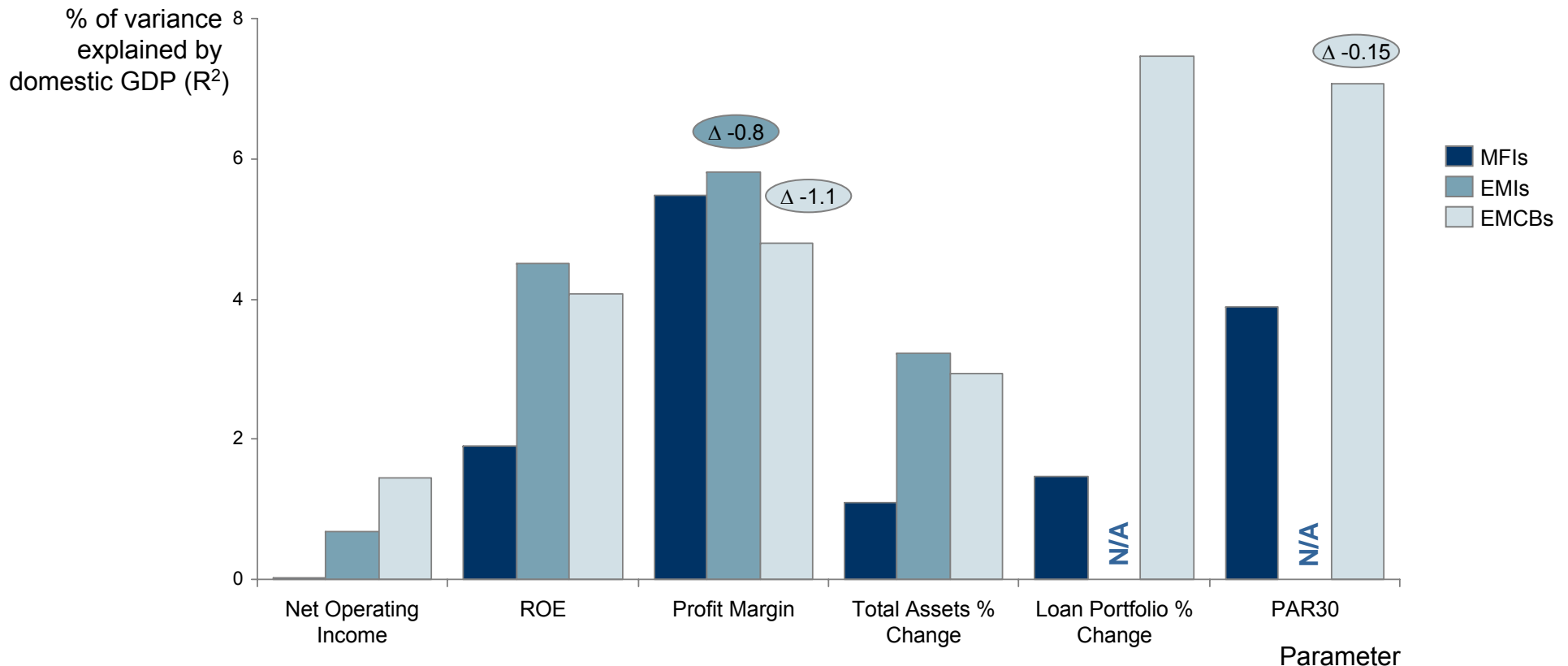
# MFIs without significant exposure to global capital markets

## Correlations with MSCI Emerging Market Index across metrics



# MFIs with significant exposure to domestic economy

## Correlations with domestic GDP across metrics



- **MFIs:** Significant correlation regarding all fundamental parameters analyzed
- **EMIs and EMCBs:** Consistently highly significant correlation
- **MFIs vs. EMIs:** MFIs with significantly more correlation regarding Profit Margin
- **MFIs vs. EMCBs:** MFIs with highly significantly more correlation regarding Profit margin, but with significantly less correlation regarding PAR30

○ Difference in beta coefficient

# Statistically significant correlations

## Summary of results

Top 325 MFIs					
<i>Parameters tested</i>	S&P 500	MSCI World Index	MSCI EM Index	Domestic Stock Index	Domestic GDP
NOI					
ROE					+
Profit Margin		+			+
Total Assets % change					+
Loan Portfolio % change					+
PAR 30					+

+ Statistically significant regression coefficient

Top 325 Emerging Market Institutions (EMIs)					
<i>Parameters tested</i>	S&P 500	MSCI World Index	MSCI EM Index	Domestic Stock Index	Domestic GDP
NOI	+	+	+	+	+
ROE	+	+	+	+	+
Profit Margin	+	+	+	+	+
Total Assets % change	+	+	+	+	+
Loan Portfolio % change	N/A	N/A	N/A	N/A	N/A
PAR 30	N/A	N/A	N/A	N/A	N/A

+ Statistically significant regression coefficient

Top 325 Emerging Market Commercial Banks (EMCBs)					
<i>Parameters tested</i>	S&P 500	MSCI World Index	MSCI EM Index	Domestic Stock Index	Domestic GDP
NOI	+	+	+		+
ROE	+	+	+		+
Profit Margin	+	+	+		+
Total Assets % change	+	+	+		+
Loan Portfolio % change	N/A	N/A	N/A	N/A	N/A
PAR 30	N/A	N/A	N/A	N/A	N/A

+ Statistically significant regression coefficient

# Statistically significant difference of MFIs, EMIs & EMCBs

## Summary of results

MFIs vs. EMIs					
Parameters tested	S&P 500	MSCI World Index	MSCI EM Index	Domestic Stock Index	Domestic GDP
NOI	+	+	+		
ROE			+		
Profit Margin			+		-
Total Assets % change	+	+	+		
Loan Portfolio % change	N/A	N/A	N/A	N/A	N/A
PAR 30	N/A	N/A	N/A	N/A	N/A

+ MFIs significantly less sensitive; - EMIs / EMCBs significantly less sensitive

MFIs vs. EMCBs					
Parameters tested	S&P 500	MSCI World Index	MSCI EM Index	Domestic Stock Index	Domestic GDP
NOI	+	+			
ROE	+	+	+		
Profit Margin	+	+	+		-
Total Assets % change	+	+	+		
Loan Portfolio % change	+	+	+		
PAR 30	+	+	+		+

+ MFIs significantly less sensitive; - EMIs / EMCBs significantly less sensitive

### Global Market Risk

- MFIs show significantly less correlation than EMIs and EMCBs for all parameters analyzed

### Domestic Market Risk

- MFIs display significantly higher regression coefficient than other institutions regarding their profit margin
- MFIs display significantly lower regression coefficient than EMCBs regarding their PAR
- R-squared values indicate that MFIs are less exposed to domestic market movements