

A thick black L-shaped frame surrounds the text. The top-left corner is a horizontal bar extending to the right, then a vertical bar extending downwards. The bottom-right corner is a horizontal bar extending to the left, then a vertical bar extending upwards.

MACRO-PRUDENTIAL TOOLS AND FIRM FINANCING

Meghana Ayyagari, Thorsten
Beck and Maria Soledad
Martinez Peria

Motivation: SME financing

- **constraints** Advanced countries: aftermath of the Great Recession: SMEs continue to experience credit constraints, potentially delaying the economic recovery
- Emerging markets: SME finance continues as challenge
- At forefront of policy debate and agenda
 - *Maya Declaration*
 - *G20 Peer Learning Program for Financial Inclusion (Los Cabos 2012, Mexico G20 Presidency).*
 - *The UN Secretary General's High Level Panel on the post-2015 Development Agenda*
- How do financial sector policies affect firm financing, especially SMEs' financing?

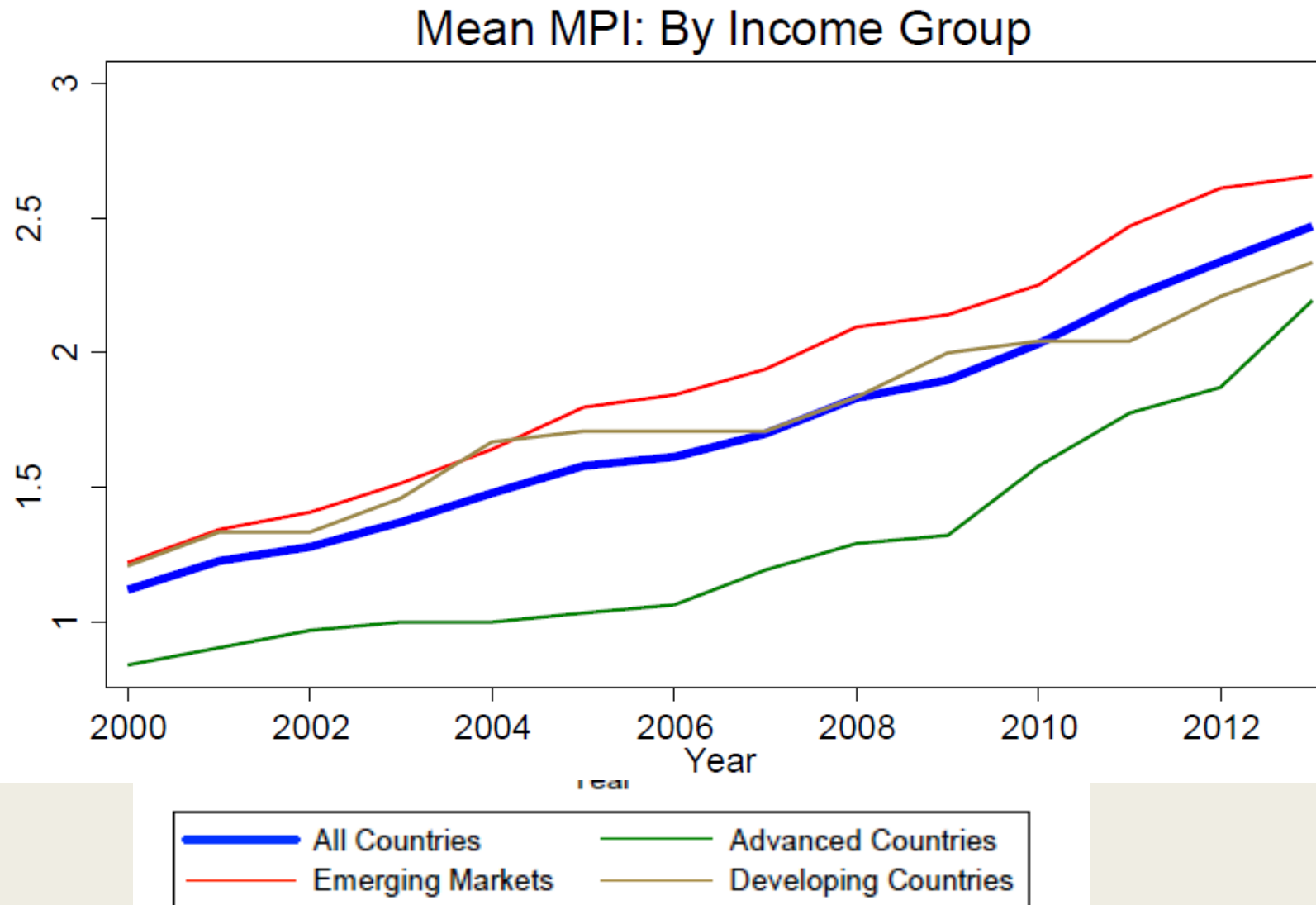
Motivation: Macro-pru – new kid on the block

- Price vs. asset inflation
- Mopping up vs. creating moral hazard
- Micro-prudential is enough vs. fallacy of composition
 - *The focus of regulators was on micro-prudential regulation that involves ensuring no individual bank takes large risks*
 - *Fallacy of composition: if all individual financial institutions are safe, this does NOT imply systemic stability*
- But how new is this kid?
 - *Financial repression in new clothes?*
- How effective are these regulatory tools? Are there “distributional” implications?

Deepening/inclusion vs. stability

- Trade-off between more efficient and more inclusive financial systems and financial stability
- Lending to “marginal” borrowers shows this trade-off.
 - *Household lending – lower market segments (e.g., subprime mortgage)*
 - *Small business lending – collateral, information frictions etc.*
- Literature has shown stronger effect of (i) financial underdevelopment and (ii) restrictive monetary and regulatory policies on small business funding
- **What is the effectiveness of macro-prudential policies?**

Macro-pru: Development over



Source: Cerutti, Claessens, and Laeven (2014)

Problems with aggregate data when assessing macro-pru

- Endogeneity concerns, demand vs. supply impact
- Cannot assess channels and mechanisms
- Needed: micro-level data, such as credit registry or firm-level data
- Micro-level data allow differentiate between
 - *Extensive and intensive margins*
 - *Volume and risk-taking effects*
- Country-studies vs. cross-country studies
 - *Detailed indicators of specific macro-pru measures over time vs. crude measures of application of different macro-pru measures*
 - *Internal vs. external validity*
 - *Spain, Korea, UK etc. papers*

This paper

- Sample of 56 countries (advanced and emerging)
- Detailed data on which macro-prudential tools were used in which country in which year
- Firm-level data on financing growth
 - *Allows to differentiate between firms of different sizes and age*
- Assess the relationship between macro-prudential rules and firm financing, controlling for other macroeconomic trends/policies and firm-time-invariant characteristics

Data

- Macro-prudential database: Global Macroprudential Policy Instruments (GMPI) (Cerutti, Claessens and Laeven, 2015): 12 different measures of policy tools
 - *MPI: macro-prudential index*
 - *Borrower-targeted: loan-to-value and debt-to-income ratios*
 - *Financial institution targeted: dynamic loan-loss provisioning, counter-cyclical capital buffers, leverage ratio, capital surcharge for systemically important financial institutions, limits on interbank exposures, concentration limits, limits on foreign or domestic currency loans, reserve requirement ratios and taxes or levies on financial institutions*
- Orbis: firm-level data, both listed and private firms
 - *Restrictions: non-financial firms only; countries with at least 25 firms; drop M&A cases; drop outliers (negative assets etc.)*
 - *1.3 million firms*
- Combined sample period: 2002-2011

Descriptive statistics

	Mean	Median	Standard deviation	Minimum	Maximum	Observations
Short-term financing growth	0.0319	0.0258	0.5354	-1.6546	1.6877	3,143,321
Long-term financing growth	-0.0656	-0.0773	0.4399	-1.3659	1.3607	3,143,321
Overall financing growth	-0.0155	-0.0335	0.2960	-0.7135	0.8944	3,143,321
Log (Total assets)	14.3372	14.2395	1.6434	11.4746	17.3467	3,143,321
GDP growth	3.5350	3.7689	4.0179	-14.8142	15.2404	411
Real policy rate	0.2087	0.3433	4.6918	-16.9571	25.6001	411
MPI	1.7348	1	1.7711	0	8	411
BOR	0.3723	0	0.6553	0	2	411
FIN	1.3625	1	1.4081	0	6	411

Methodology

$$y_{ijt} = \alpha_1 + \beta_1 \text{Macro-pru}_{jt-1} + \beta_2 \text{Firm Size}_{it-1} + \beta_3 \text{Macro}_{jt-1} + \beta_4 \text{GFC}_t + \eta_i + \varepsilon_{ijt}$$

- Y: short-term funding growth, long-term funding growth, overall funding growth
- Macro: Growth, real policy rate, GFC dummy
- Firm-fixed effects (changes in firms over time as macro-pru changes)
- Winsorized at 5th and 95th percentiles
- Weighted regressions
- Clustered error terms on country-level
- Overall sample,
 - *Size interaction: less than 50 employees*
 - *Age interaction: less than three years since incorporation*

SME vs. large; emerging vs. advanced – short-term borrowing

	Short-term financing growth	Short-term financing growth	Short-term financing growth	Short-term financing growth	Short-term financing growth	Short-term financing growth
	Emerging	Advanced	Emerging	Advanced	Emerging	Advanced
GDP growth	0.015*** (0.004)	0.009*** (0.003)	0.015*** (0.004)	0.009** (0.003)	0.015*** (0.004)	0.009** (0.003)
Real policy rate	0.005* (0.003)	-0.005 (0.004)	0.005* (0.003)	-0.004 (0.004)	0.005* (0.003)	-0.005 (0.004)
GFC	-0.123*** (0.014)	-0.033** (0.016)	-0.123*** (0.012)	-0.034** (0.016)	-0.118*** (0.017)	-0.033** (0.016)
MPI	-0.054*** (0.016)	-0.041*** (0.011)				
MPI for SME	-0.013 (0.015)	-0.022*** (0.006)				
BOR			-0.095*** (0.018)	-0.076*** (0.010)		
BOR for SME			-0.013 (0.019)	0.017 (0.015)		
FIN					-0.051 (0.035)	-0.042** (0.018)
FIN for SME					-0.018 (0.025)	-0.049*** (0.013)
N	185646	2634590	185646	2634590	185646	2634590
adj. R-sq	-0.032	-0.033	-0.031	-0.033	-0.033	-0.033
countries	24.000	31.000	24.000	31.000	24.000	31.000

SME vs. large; emerging vs. advanced – long-term borrowing

	Long-term financing growth	Long-term financing growth	Long-term financing growth	Long-term financing growth	Long-term financing growth	Long-term financing growth
	Emerging	Advanced	Emerging	Advanced	Emerging	Advanced
GDP growth	0.016*** (0.003)	0.009** (0.003)	0.016*** (0.003)	0.009** (0.003)	0.016*** (0.003)	0.009** (0.003)
Real policy rate	0.007** (0.003)	-0.007* (0.004)	0.007** (0.003)	-0.006 (0.004)	0.007** (0.003)	-0.007* (0.004)
GFC	-0.112*** (0.018)	0.002 (0.021)	-0.112*** (0.018)	0.002 (0.021)	-0.106*** (0.020)	0.003 (0.020)
MPI	-0.059** (0.022)	-0.073*** (0.017)				
MPI vs SME	-0.025*** (0.006)	-0.007 (0.014)				
BOR			-0.101*** (0.029)	-0.109*** (0.009)		
BOR vs SME			-0.029*** (0.003)	0.046** (0.017)		
FIN					-0.058 (0.038)	-0.080** (0.030)
FIN vs SME					-0.033*** (0.011)	-0.052*** (0.009)
N	185646	2634590	185646	2634590	185646	2634590
adj. R-sq	0.074	0.059	0.074	0.058	0.071	0.059
countries	24.000	31.000	24.000	31.000	24.000	31.000

SME vs. large; emerging vs. advanced – overall funding

	Overall financing growth	Overall financing growth	Overall financing growth	Overall financing growth	Overall financing growth	Overall financing growth
	Emerging	Advanced	Emerging	Advanced	Emerging	Advanced
GDP growth	0.015*** (0.004)	0.009** (0.003)	0.014*** (0.004)	0.009** (0.003)	0.014*** (0.003)	0.009** (0.003)
Real policy rate	0.005* (0.003)	-0.006 (0.004)	0.005* (0.003)	-0.005 (0.004)	0.005** (0.003)	-0.006 (0.004)
GFC	-0.121*** (0.017)	-0.016 (0.018)	-0.121*** (0.016)	-0.016 (0.018)	-0.116*** (0.019)	-0.015 (0.018)
MPI	-0.052** (0.019)	-0.055*** (0.012)				
MPI of SME	-0.017* (0.008)	-0.011 (0.010)				
BOR			-0.093*** (0.024)	-0.077*** (0.010)		
BOR of SME			-0.015** (0.006)	0.028* (0.016)		
FIN					-0.046 (0.036)	-0.060** (0.023)
FIN of SME					-0.028** (0.012)	-0.050*** (0.008)
N	185646	2634590	185646	2634590	185646	2634590
adj. R-sq	0.103	0.074	0.104	0.072	0.098	0.074
countries	24.000	31.000	24.000	31.000	24.000	31.000

Young vs. old; emerging vs. advanced – short-term borrowing

	Short-term financing growth	Short-term financing growth	Short-term financing growth	Short-term financing growth	Short-term financing growth	Short-term financing growth
	Emerging	Advanced	Emerging	Advanced	Emerging	Advanced
GDP growth	-0.005 (0.008)	0.006** (0.002)	-0.004 (0.007)	0.006** (0.002)	-0.004 (0.007)	0.006** (0.002)
Log(Total Assets)	-0.108** (0.042)	-0.108*** (0.024)	-0.103** (0.041)	-0.108*** (0.024)	-0.114** (0.043)	-0.110*** (0.024)
Real Policy Rate	-0.012 (0.010)	-0.004 (0.003)	-0.012 (0.010)	-0.004 (0.003)	-0.012 (0.010)	-0.004 (0.002)
GFC	-0.119* (0.069)	-0.050*** (0.018)	-0.121* (0.068)	-0.050*** (0.018)	-0.120* (0.069)	-0.050*** (0.018)
MPI	-0.019 (0.036)	0.000 (0.017)				
MPI ^{Young}	0.016 (0.051)	-0.072*** (0.025)				
BOR			-0.082 (0.067)	-0.015 (0.020)		
BOR ^{Young}			0.009 (0.075)	-0.057 (0.034)		
FIN					-0.002 (0.044)	0.008 (0.021)
FIN ^{Young}					0.043 (0.077)	-0.092*** (0.029)
N	203183	2888236	203183	2888236	203183	2888236
adj. R-sq	0.083	-0.025	0.084	-0.025	0.083	-0.025
countries	25.000	31.000	25.000	31.000	25.000	31.000

Young vs. old; emerging vs. advanced – long-term borrowing

	Long-term financing growth	Long-term financing growth	Long-term financing growth	Long-term financing growth	Long-term financing growth	Long-term financing growth
	Emerging	Advanced	Emerging	Advanced	Emerging	Advanced
GDP growth	0.001 (0.006)	0.008*** (0.001)	0.001 (0.006)	0.008*** (0.001)	0.001 (0.006)	0.008*** (0.001)
Log Total Assets	-0.179*** (0.032)	-0.125*** (0.017)	-0.177*** (0.033)	-0.125*** (0.017)	-0.184*** (0.033)	-0.127*** (0.017)
Real Policy Rate	-0.001 (0.003)	-0.003 (0.003)	-0.001 (0.003)	-0.003 (0.003)	-0.001 (0.003)	-0.003 (0.003)
GFC	-0.051* (0.026)	-0.050*** (0.014)	-0.053* (0.027)	-0.050*** (0.014)	-0.051* (0.027)	-0.050*** (0.014)
MPI	-0.031* (0.015)	-0.007 (0.019)				
MPI*Young	-0.005 (0.015)	-0.052*** (0.012)				
BOR			-0.090* (0.049)	-0.014 (0.019)		
BOR*Young			0.016 (0.045)	-0.055*** (0.011)		
FIN					-0.022 (0.024)	-0.003 (0.026)
FIN*Young					-0.014 (0.036)	-0.049** (0.019)
N	203183	2888236	203183	2888236	203183	2888236
adj. R-sq	0.191	0.096	0.191	0.096	0.190	0.095
countries	25.000	31.000	25.000	31.000	25.000	31.000

Young vs. old; emerging vs. advanced – overall funding

	Overall financing growth	Overall financing growth	Overall financing growth	Overall financing growth	Overall financing growth	Overall financing growth
	Emergin	Advance	Emergin	Advance	Emergin	Advance
GDP growth	0.000 (0.005)	0.007*** (0.002)	0.000 (0.005)	0.007*** (0.002)	0.000 (0.005)	0.007*** (0.002)
Log Total Assets	-0.131*** (0.038)	-0.133*** (0.016)	-0.128*** (0.037)	-0.134*** (0.015)	-0.135*** (0.038)	-0.134*** (0.015)
Real policy rate	-0.003 (0.003)	-0.004* (0.002)	-0.003 (0.003)	-0.004* (0.002)	-0.003 (0.003)	-0.004* (0.002)
GFC	-0.074*** (0.026)	-0.041*** (0.013)	-0.075*** (0.026)	-0.041*** (0.013)	-0.074** (0.026)	-0.040*** (0.013)
MPI	-0.020 (0.012)	-0.006 (0.013)				
MPI*Young	0.005 (0.015)	-0.045*** (0.012)				
BOR			-0.064*** (0.019)	-0.009 (0.009)		
BOR*Young			0.003 (0.013)	-0.054*** (0.020)		
FIN					-0.012 (0.016)	-0.004 (0.018)
FIN*Young					0.017 (0.030)	-0.036* (0.019)
N	203183	2888236	203183	2888236	203183	2888236
adj. R-sq	0.200	0.106	0.201	0.106	0.199	0.105
countries	25.000	31.000	25.000	31.000	25.000	31.000

Results so far

- Negative relationship between macro-prudential and firm financing
- Stronger for small firms (< 50 employees)
- Some evidence for differentiation according to firm age in advanced economies
- Stronger results for borrower-targeted policies in overall sample
- Different results in emerging vs. advanced countries

Broader implications

- Results in line with monetary policy literature: small firms are affected most
- Results clearly show the trade-off between deepening and stability
- Macro-pru can be effective, though it has important “distributional” implications

THANK YOU

Thorsten Beck
www.thorstenbeck.com

