



# Macro-Prudential Policies to Mitigate Financial System Vulnerabilities (Claessens, Ghosh and Mihet)

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We need empirical evaluation of regulatory policies at work, not just in emerging markets but also in developed (submerging!) markets

The paper uses micro/bank-level data across countries to examine a range of macro-prudential tools in place and see their effectiveness – over the cycle – in limiting asset, leverage, and non-core leverage growth

## **Origins/causes of the 2008 financial crisis**

- Financial sector took one-way, leveraged bets on housing sector
- Financial sector well-capitalized by regulatory standards, but undertook “tail” risks: asset commonality and resulting liquidity risk

## **International response to the crisis: Basel III**

- Higher capital ratio against risk-adjusted assets, simple leverage ratio, liquidity surcharges, countercyclical charges
- Basel III is thus still largely micro prudential in focus  
(E.g.: Low risk weights on systemically risky assets such as housing, risky sov debt)

## **Why regulation needs to take a broader perspective**

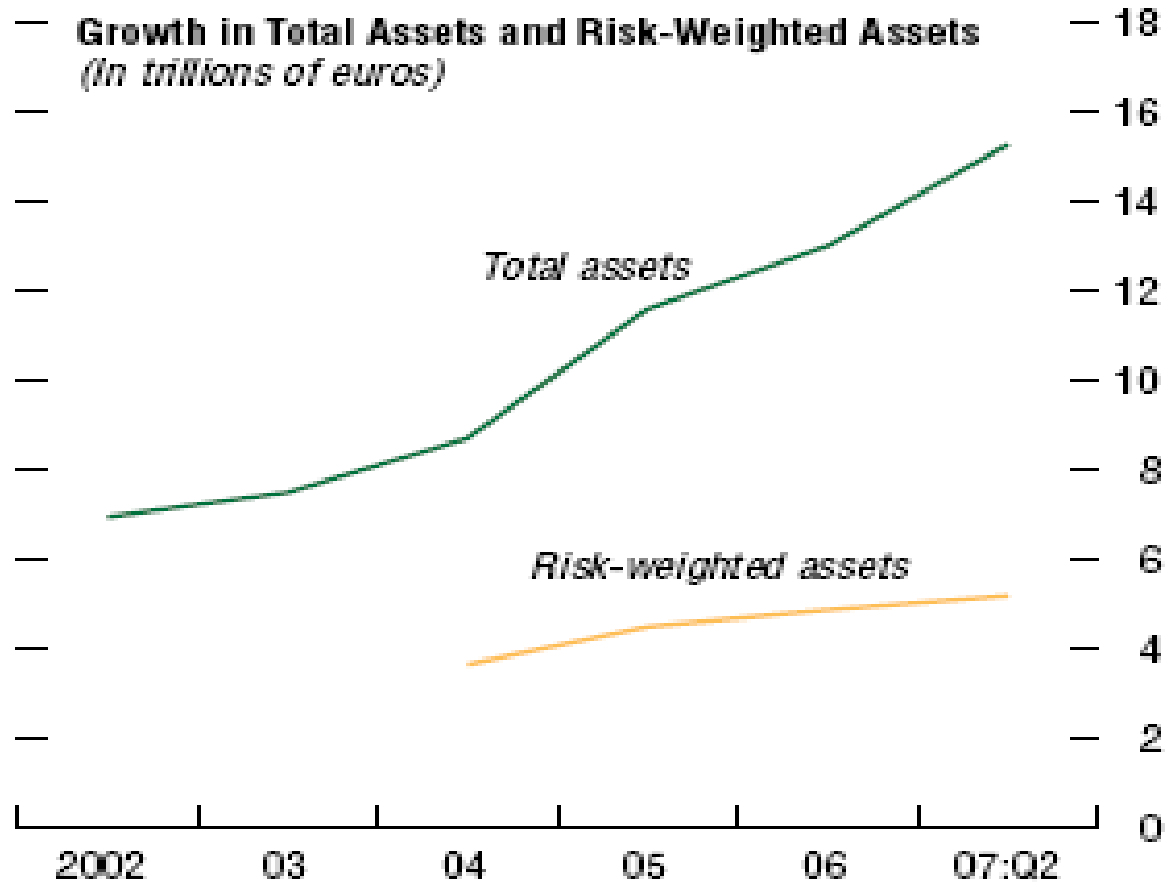
- Micro prudential needs to be adjusted for macro-prudential risks
- These risks arise through various forms of externalities  
(asset commonality, leverage, fire sales, and resulting government guarantees)

# Is Basel the right macro-prudential approach? Lack of Pricing of Systemic Risk

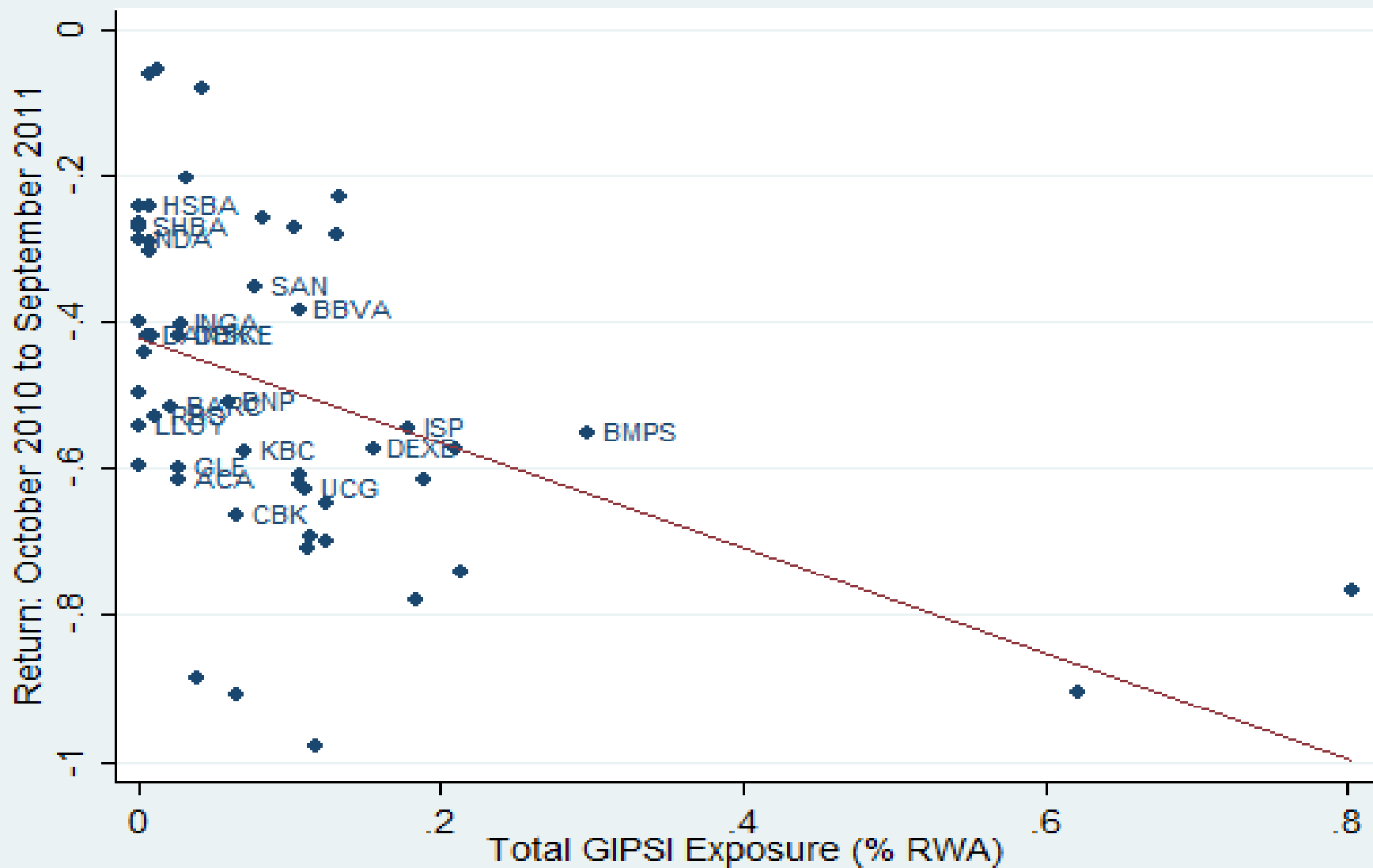
Common exposure risk, if not priced, will keep fueling “bubbles”

- Basel approach: static over-the-cycle/historically-calibrated risk-weights
  - Level of capital requirements raised by riskiest assets are endogenously those that have the lowest or no risk-weights!
  - Lack of dynamic sector weight-adjustment a serious limitation
1. Housing risk weights over time got anchored to the GSE-backed MBS risk-weight of 20%, fueling a credit bubble in housing
  2. Lack of adjustment in sovereign bond risk-weights allowed weak Eurozone countries' borrowing to remain unchecked (see next two slides)
- Basel III capital ratio: more of the same thing, but risk weights inadequate
  - Basel III liquidity ratios, countercyclical capital: improvements over the past

# Low Growth in Risk-Weighted Assets (Source: IMF GFSR April 2008)



# GIPSI exposure and bank performance



# Principles for Regulation

1. Efficient pricing of government guarantees
  - Deposit insurance; Too Big To Fail guarantees; Implicit (now explicit) guarantees of state-owned enterprises; Loan guarantees and liquidity facilities during a crisis
2. Resolution authority
  - Legislative authority over resolution; Prompt corrective action; Living wills, “bail-in” debt (subordinated debt that converts into equity), ...
3. Transparency
  - Asset/liability maps, Funding risks, Contingent liabilities – lines of credit, derivatives margin calls, ...
4. “Tax” or capital surcharge for systemic risk contributions
  - Market-based measures: Higher leverage, beta, size, illiquidity...
  - Example: [NYU Stern Systemic Risk Rankings](#), Stress tests, Countercyclical enforcement
5. “Tax” on complexity
  - Volcker rule, Vickers, Liikanen – separate trading from commercial and investment banking

NO ATTEMPTS TO DIRECTLY REGULATE ASSET QUALITY OR FOREIGN FLOWS

RESERVE REQUIREMENTS NOT AT WORK DUE TO LARGE SHARE OF NON-BANK

DEPOSITS (SHADOW BANKING)

## **Emerging markets/developing countries face some specific challenges**

- Economic and financial sector features

### **Specific questions to be addressed:**

**How to address the macro prudential aspects for emerging markets?**

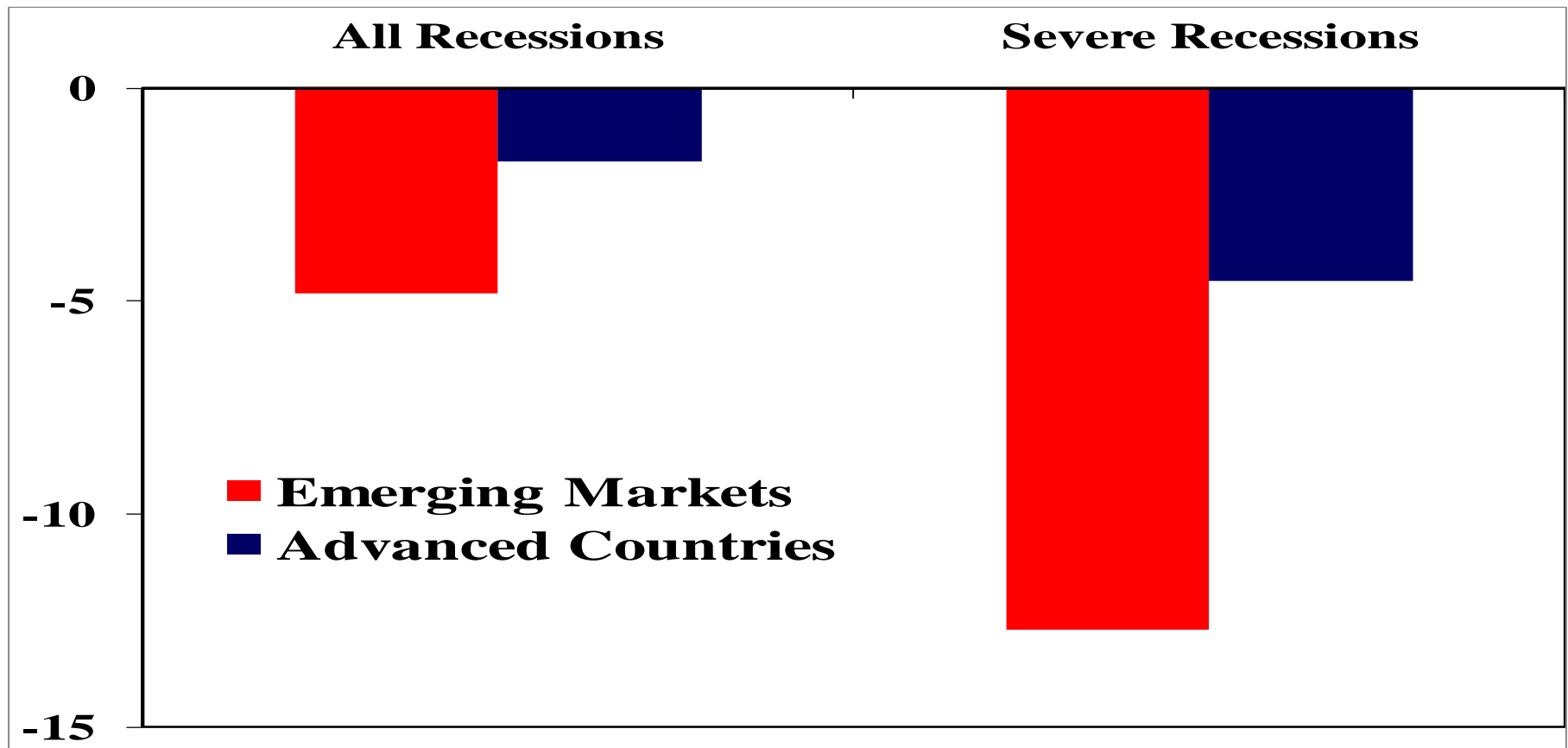
**Current situation in emerging markets**

**Emerging sources of spillover of foreign risks**



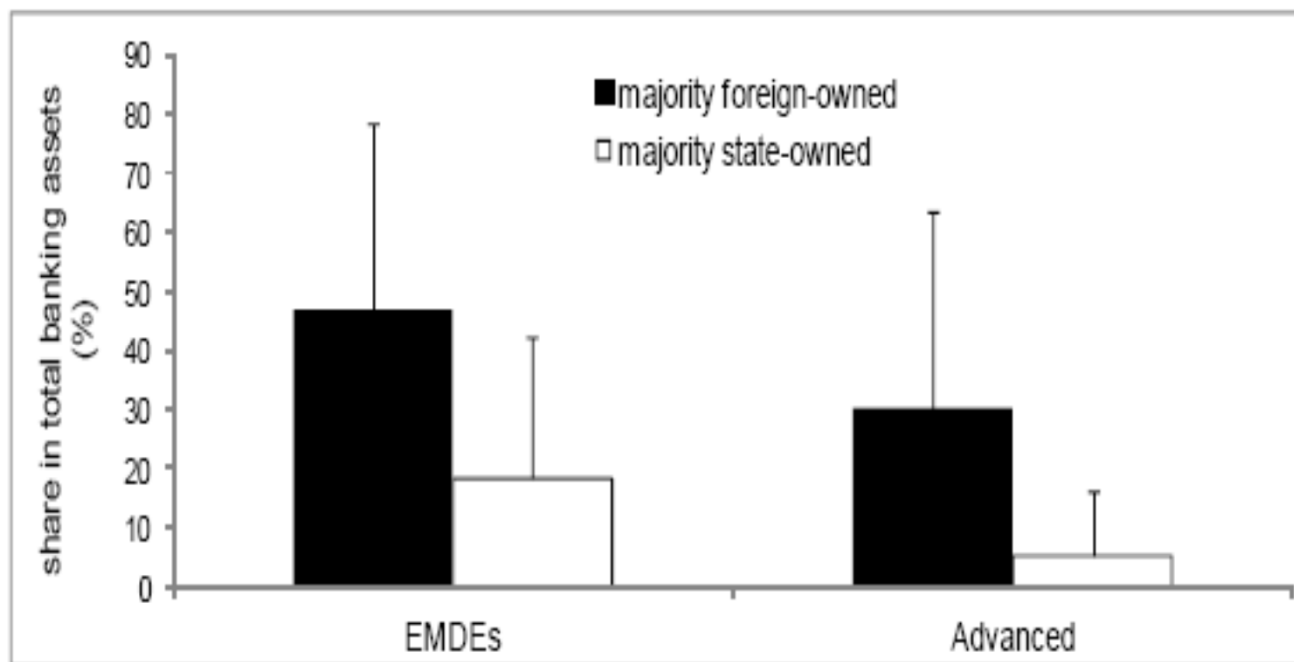
## Greater risks/volatility in emerging markets

- Greater domestic financial market and other imperfections—which can result in more extreme business and financial cycles.
- Recessions Deeper in Emerging Markets (percent change in GDP from peak to trough)



## Large presence of state-owned banks in emerging markets

- Traditionally, emerging markets have primarily had state-owned banking, and even today, presence is large in many countries (China, India, ...)



Sources: World Bank Banking Regulation and Supervision database.

## Several weaknesses in institutional environment

- Deficiencies in quality of financial sector regulatory framework
- Weaker legal rights in general, including for resolution of financial firms
- Less adequate disclosure and transparency requirements for corporate firms, although information availability improving
- Less deep, simpler financial systems
- More state owned banks (see figure earlier)
- Weak supervision of the NBFIs sector
  - Inadequate regulatory framework, fast growth in NBFIs (India, China, ...)
  - Weaker supervisory capacity
  - Potentially greater regional/political influence in some cases

# Need for macro prudential measures in EM

- Given higher volatility of capital inflows and greater amplitude of business-financial cycles, arguably macro prudential approaches are even more important for emerging markets.
- The good news is that emerging markets are already more familiar with the use of macro prudential measures.

	Caps on LTV	Caps on DTI	Caps on FX loans	Caps on credit	Limits on net open FX position or currency mismatch	Limits on maturity mismatch	Reserve requirements	Counter-cyclical capital	Time varying dynamic provisions	Restriction on profit distribution
Number of Countries	14	10	8	7	19	9	19	9	12	7
Percent of sample	29	20	16	14	39	18	39	18	24	14

Source: IMF Financial Stability and Macro prudential Survey 2010

# What other macro prudential measures for emerging markets should consider? Tradeoffs?

- Charge banks for guarantees and systemic risk contributions
  - Conditioning tax on a macro/stress event effectively lends the policy macro-prudential, though seems micro-prudential
  - Forms: Deposit insurance premium, systemic risk surcharge, capital requirement for systemic risk contributions of financial firms
  - How to calculate the “tax” or the premium?
    1. Market data (downside beta, leverage, illiquidity, ...)
      - See NYU-Stern Systemic Risk Rankings
    2. Use regulatory stress tests
    3. Better still, use both...

## Macro prudential measures for EM(cont'd)

- Market data may be unavailable (private banks), and stress tests could get compromised/captured
- Alternatives:
  - Revise risk-weights sectorally over time to reflect lending concentrations (e.g., Reserve Bank of India)
  - Leverage ratio (un-weighted, but 3% is too low) – JPMorgan, HSBC, Rabobank ... over 6% even at peak of crises
  - Limits on foreign banking, short-term debt funded by foreign capital, non-core to core deposit liabilities, ...
  - Asset-level leverage ratio, Debt to income ratios – LTV < 80%, e.g.
  - Reserve requirements – e.g., 2% of deposits at central bank

# Regression results (2000-2010)

Explanatory Variables	Leverage growth				Asset growth				NCC growth			
	(1)	(2)	(3)	(4) (Simultaneous)	(5)	(6)	(7)	(8) (Simultaneous)	(9)	(10)	(11)	(12) (Simultaneous)
Lao Dependent Variable	-0.118*** [0.031]	Yes	Yes	Yes	-0.533*** [0.017]	Yes	Yes	Yes	-0.467*** [0.018]	Yes	Yes	Yes
Lao Real GDP Growth	0.257*** [0.055]	Yes	Yes	Yes	0.213** [0.085]	Yes	Yes	Yes	0.284* [0.161]	Yes	Yes	Yes
Lao CB Rate Growth	-0.018* [0.009]	Yes	Yes	Yes	-0.032** [0.013]	Yes	Yes	Yes	-0.113*** [0.032]	Yes	Yes	Yes
Lao NEER Growth	-0.334* [0.180]	Yes	Yes	Yes	0.743*** [0.132]	Yes	Yes	Yes	1.412*** [0.270]	Yes	Yes	Yes
FX Rate Arrangement	4.000** [1.888]	Yes	Yes	Yes	1.739 [1.507]	Yes	Yes	Yes	0.121 [0.336]	Yes	Yes	Yes
Lao Capital Adeq. Ratio	0.013*** [0.005]	Yes	Yes	Yes	0.010*** [0.003]	Yes	Yes	Yes	0.028* [0.015]	Yes	Yes	Yes
Lao Liquidity Ratio	0.024 [0.098]	Yes	Yes	Yes	-0.074 [0.048]	Yes	Yes	Yes	-0.728* [0.389]	Yes	Yes	Yes
Other MaPP		-1.531*** [0.391]	-1.433*** [0.403]	-0.911* [0.810]		-1.647** [0.678]	-1.781*** [0.651]	-0.235* [0.108]		-10.239*** [3.494]	-9.008*** [3.401]	-11.675* [6.122]
LTV		-0.939* [0.403]	-0.977* [0.486]	-4.845* [2.667]		-2.162*** [0.774]	-2.333*** [0.752]	-0.687 [1.694]		-15.854*** [5.123]	-13.027*** [5.023]	-29.251 [24.872]
LTV X Lao Dependent Var			-0.683*** [0.200]	0.918 [0.789]			-0.091 [0.123]	-1.153 [2.083]			-0.493*** [0.097]	-5.885 [7.295]
DTI		-5.476** [2.514]	-5.905** [2.496]	(omitted)		-3.915* [2.218]	-4.189* [2.214]	(omitted)		-3.983*** [1.526]	-1.819* [0.909]	(omitted)
DTI X Lao Dependent Var			-1.638*** [0.356]	-1.596 [1.469]			0.257 [0.221]	1.381 [2.835]			-2.065*** [0.160]	4.061 [10.118]
CG		-0.021 [0.396]	0.250 [0.390]	-1.472* [0.876]		-0.648*** [0.204]	-0.729*** [0.225]	-0.930 [1.109]		-1.912 [1.565]	0.692 [0.933]	-3.766 [2.839]
CG X Lao Dependent Var			-0.831*** [0.205]	-0.122 [0.702]			-0.449*** [0.116]	-2.015 [2.057]			-1.000*** [0.076]	-8.061* [4.606]
FC		-1.831*** [0.654]	-1.722*** [0.593]	(omitted)		-0.971* [0.437]	-1.656** [0.706]	(omitted)		0.498 [0.325]	0.182 [0.345]	(omitted)
FC X Lao Dependent Var			-6.496* [3.761]	(omitted)			3.958 [3.186]	(omitted)			-0.915*** [0.076]	(omitted)
KK		-0.279* [0.148]	-0.151 [0.133]	-0.946** [0.430]		-0.087* [0.048]	-0.041 [0.073]	-0.280** [0.134]		-0.216 [2.894]	-0.33 [2.895]	-2.252*** [0.591]
KK X Lao Dependent Var			-0.581*** [0.166]	0.109 [0.270]			-0.762*** [0.136]	1.497*** [0.339]			0.186 [0.507]	-6.786 [4.326]
DP		-0.074 [0.224]	-0.021 [0.230]	-0.915* [0.494]		-0.536*** [0.122]	-0.534*** [0.124]	-1.568* [0.830]		-1.74 [4.677]	-1.604 [4.382]	-2.669 [4.036]
DP X Lao Dependent Var			0.854 [0.884]	-2.659 [3.175]			-0.745** [0.352]	-14.262** [6.235]			0.86 [0.650]	5.196 [67.746]
PRD		2.907 [2.332]	3.188 [2.264]	-1.008 [1.417]		-3.192 [3.056]	-1.24 [2.103]	0.665 [1.579]		3.166 [6.590]	4.569 [5.693]	4.988 [6.411]
PRD X Lao Dependent Var			2.476* [1.446]	3.296 [6.362]			2.412 [1.577]	10.423 [8.685]			0.635 [0.389]	-14.528 [66.233]
Observations	5,676	4,091	4,091	4,091	5,695	4,107	4,107	4,107	5,695	4,107	4,107	4,107
Number of banks	1,290	939	939	939	1,292	940	940	940	1,292	940	940	940

# Conclusions from the results

Effectiveness in economic terms	Non-core to core liabilities			Bank assets			Bank leverage		
	(1) Growth	(2) Pro-cyclicality	(3) Simultaneous	(1) Growth	(2) Pro-cyclicality	(3) Simultaneous	(1) Growth	(2) Pro-cyclicality	(3) Simultaneous
1	Loan to Value Caps (LTV)	Debt to Income Caps (DTI)	Credit Growth Caps (CG)	Debt to Income Caps (DTI)	Reserve Requirements (RR)	Dynamic Provisioning (DP)	Debt to Income Caps (DTI)	Limits on Foreign Lending (FC)	Loan to Value Caps (LTV)
2	Debt to Income Caps (DTI)	Credit Growth Caps (CG)	Reserve Requirements (RR)	Loan to Value Caps (LTV)	Dynamic Provisioning (DP)	Reserve Requirements (RR)	Limits on Foreign Lending (FC)	Debt to Income Caps (DTI)	Credit Growth Caps (CG)
3	Other MaPP	Limits on Foreign Lending (FC)	Other MaPP	Limits on Foreign Lending (FC)	Credit Growth Caps (CG)	Other MaPP	Loan to Value Caps (LTV)	Credit Growth Caps (CG)	Reserve Requirements (RR)

1= Most effective in economic terms. 3= Less effective in economic terms.

	Most frequently effective
	2nd most frequently effective
	3rd most frequently effective



# Some questions and suggestions

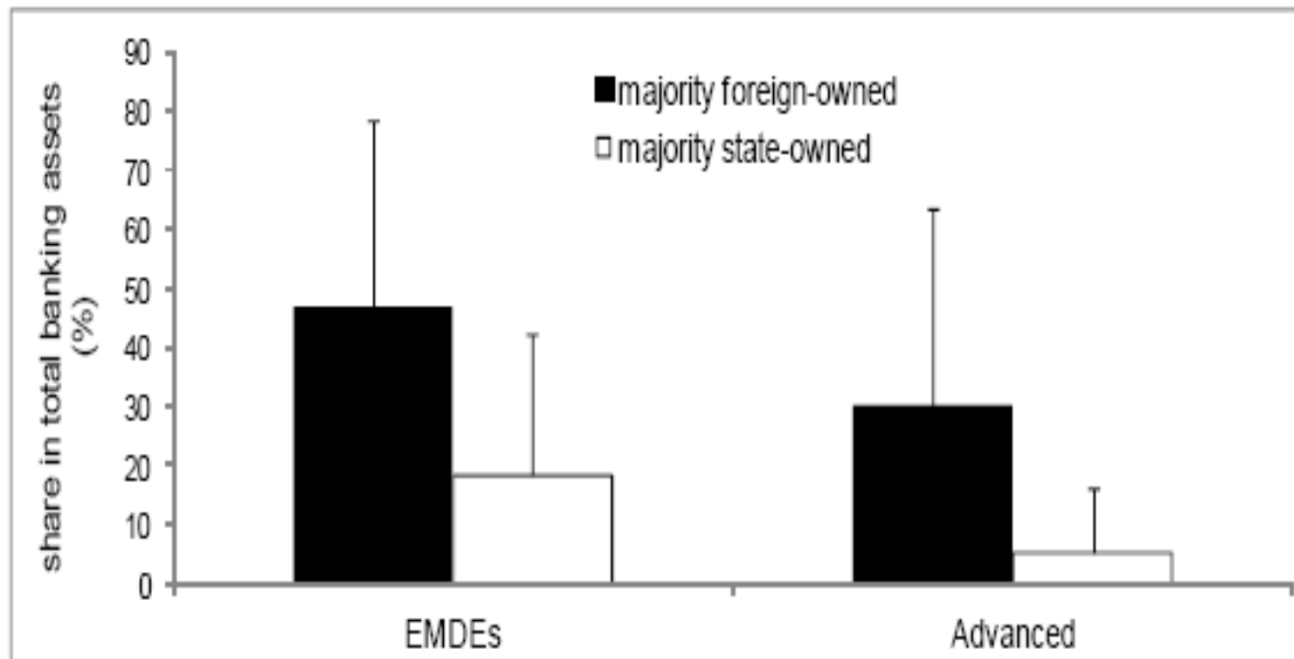
1. Does the organization structure of the banking sector matter?
  - State-owned banks, e.g., are an attractive way to stimulate economies, serve political objectives
  - How large are banks in overall credit creation? Conversely, shadow banks?
2. Regressions do not account for closed versus open capital a/c's
3. Are certain combinations of macro-prudential policies more commonly deployed, and more effective?
  - DTI/LTV + Capital requirements based on average asset quality without DTI/LTV could “repress” the financial sector leverage
4. Which policies work better when public debt to GDP is too high and sovereign credit risk is itself a substantial cyclical concern?

# All countries seem coupled

- Global finance and trade imply that growth in one part of the world crucial to sustaining risk appetite for other world's risk
  - As financial intermediaries hit capital or risk limit constraints, they withdraw funding from riskier assets (in equilibrium re-price them)
    1. Money market funds – highly leveraged – can withdraw sudden funding from banks
    2. Banks, in turn, could withdraw lines of credit from (global) corporations
    3. Corporations could cut back on trade-credit and trade could collapse...
  - 1. Banks hit by losses could refuse to buy low-grade corporate paper
    2. Corporations may withdraw their savings from money market funds
    3. Money market funds may now freeze commercial paper lending...

## Increasing risk/volatility due to foreign shocks

- Also due to increasing presence of foreign banks —which can lead to greater dependence on developments in advanced economies/parent banks



Sources: World Bank Banking Regulation and Supervision database.

# Current situation in emerging markets

- Strengths as well as weaknesses
  - Higher growth prospects
  - Better capital, lower leverage, liquidity.
  - Lower public debt, greater fiscal headroom.
  - Other weaknesses may emerge as foreign linkages get stronger, foreign policies remain distorted to encourage investments, shadow banking emerges, ...