

An Anatomy of Credit Booms and their Demise

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This paper reflects only the authors' views, and not those of the IMF

Motivation and objectives



- Conventional wisdom holds that “bad times” often follow “credit booms,” but yet until recently we had
 1. Limited evidence on CBs, and their macro/micro linkages
 2. Lacked robust method for identifying & measuring credit booms
- Mendoza & Terrones (2008) proposed a new “thresholds” method to study credit booms, but with a sample ending in 2006 we *missed all the fun!!!*
- In this paper:
 1. Review/upgrade our methodology to identify/measure CBs
 2. Examine macro dynamics around CB episodes
 3. Conduct frequency analysis of CBs, crises and triggers
 4. Examine linkages between CBs and firm & bank indicators

Main findings



1. Using 1960-2010 data for 61 ICs & EMs, we find 35 credit booms in each group (16 around recent crisis), 2.8% overall frequency
2. Booms synchronized globally, centered around “big” events
3. Three striking similarities across EMs and ICs:
 - a) Similar duration and magnitude (normalized by s.d. of credit)
 - b) Banking crises, currency crises or Sudden Stops often follow credit booms, and with similar frequencies in EMs and ICs
 - c) Credit booms follow financial reforms, surges in capital inflows and TFP, and are far more common w. managed ex. rates
4. CBs feature clear cyclical pattern in production, absorption, current account, capital flows, real ex. rates (in EMs), asset prices and firm- and bank-level financial indicators

Mendoza-Terrones Thresholds Method



- Country i is in a credit boom if:

$$l_{i,t} \geq \phi \sigma(l_i)$$

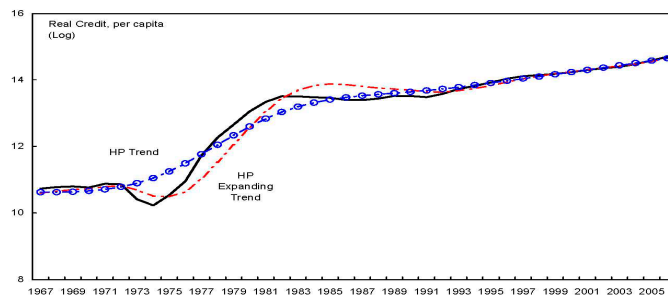
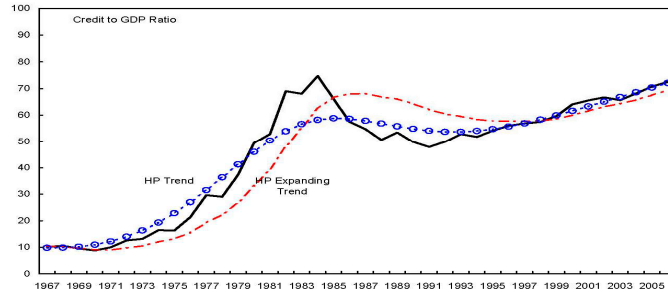
$\phi = 1.65$ boom threshold, set to std. Normal $\Pr(l_{i,t} / \sigma(l_i) \geq 1.65) = 0.05$

l_{it} deviation from HP trend in log real credit per capita

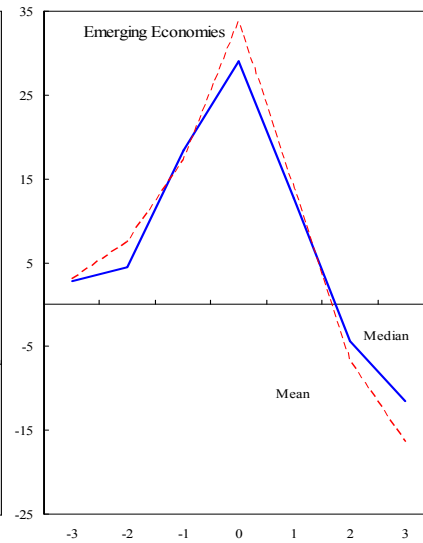
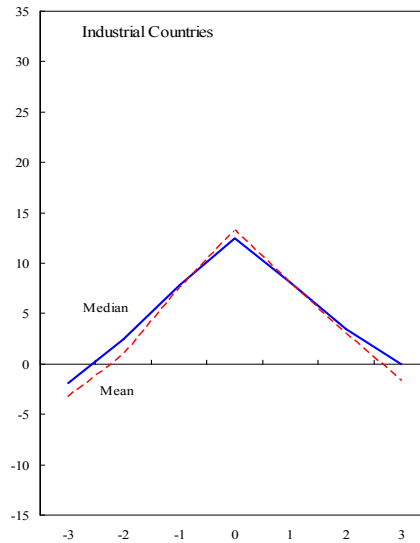
$\sigma(l_i)$ standard deviation of l_{it}

- Key differences with Gourinchas et al.01
 1. Country-specific lower bound ($\phi \sigma(l_i)$)
 2. Standard HP detrending, not “expanding trend”
 3. Credit measured as real credit per capita, not share of GDP
- Significant quantitative implications: robust to credit measure, unbiased credit trends, macro/crises linkages

Comparing methods: The case of Chile



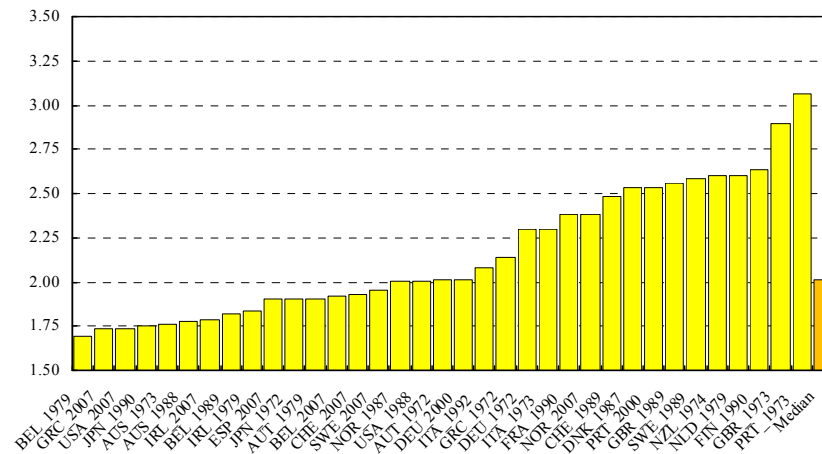
Credit booms: seven year event windows (Cross-country means and medians of cyclical component of credit)



Normalized credit boom episodes (relative to s.d. of credit in each country)



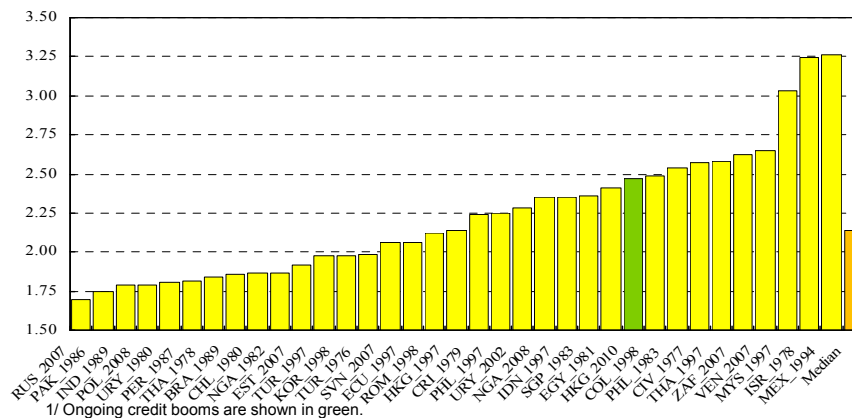
INDUSTRIAL COUNTRIES



Normalized credit boom episodes (relative to s.d. of credit in each country)

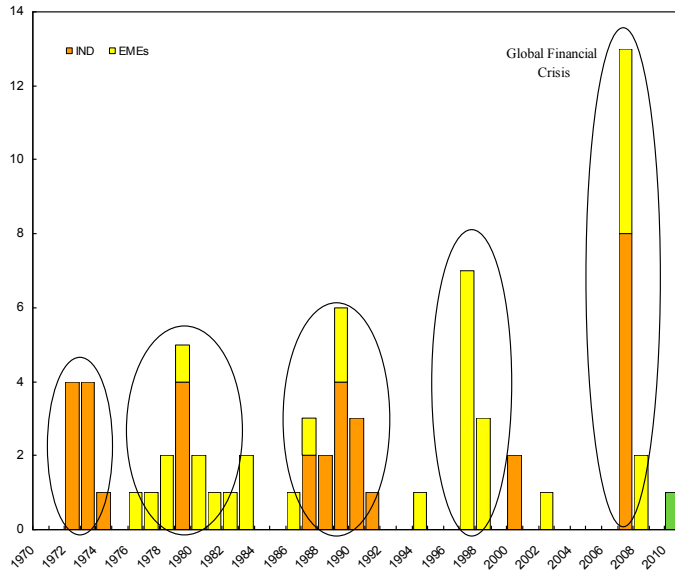


EMERGING MARKET ECONOMIES^{1/}



^{1/} Ongoing credit booms are shown in green.

CBs are synchronized around “big events”



¹ Ongoing credit booms are shown in green.

Duration statistics

Starting and Ending Thresholds	Emerging Market Economies			Industrial Countries		
	Duration	Fraction spent in		Duration	Fraction spent in	
		Upswing	Downturn		Upswing	Downturn
B. Median						
0.00	6.00	0.50	0.33	5.50	0.36	0.45
0.25	5.00	0.40	0.20	5.00	0.40	0.40
0.50	5.00	0.20	0.20	4.00	0.25	0.50
0.75	4.00	0.25	0.25	4.00	0.25	0.50
1.00	3.00	0.33	0.33	3.00	0.33	0.33

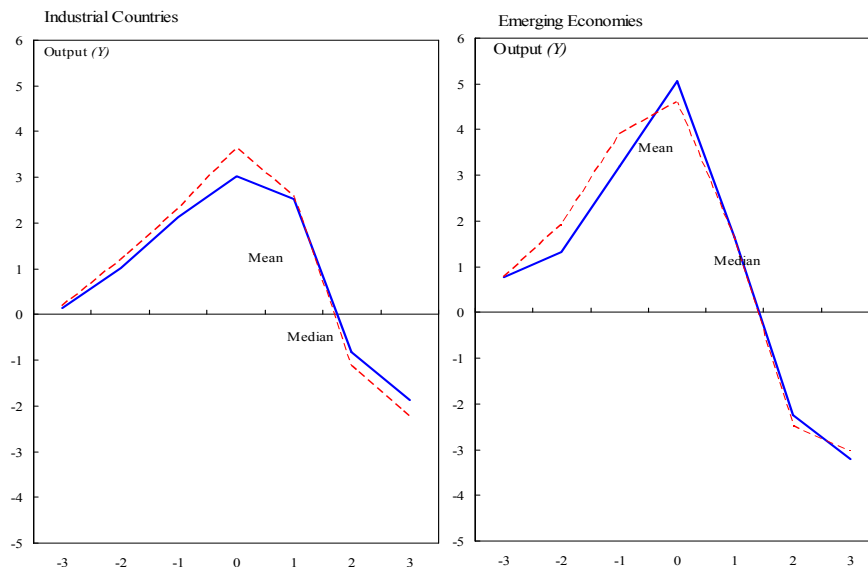
Macro “credit cycles”



- Seven-year event windows centered at CB peaks
- Clear “credit cycle” pattern similar across EMs and ICs
 1. Y, C, I, YN, KI (and RER & G in EMs) rise above trend in upswing, move below trend in downswing
 2. CAY shifts from deficit to surplus
 3. Normalized by standard deviations fluctuations are similar (except YN and RER larger in EMs)
 4. Minor changes in inflation and in ICs little change in RER & G
 5. Equity prices rise 25-30%, housing prices rise 10-15% followed by price crashes in downswing
- 50% of CBs feature *booms* in Y & C in EMs and ICs (60%/34% are I booms and 31%/46% are YN booms in ICs/EMs)

Output credit cycles

(Cross-country means and medians of cyclical component of GDP)



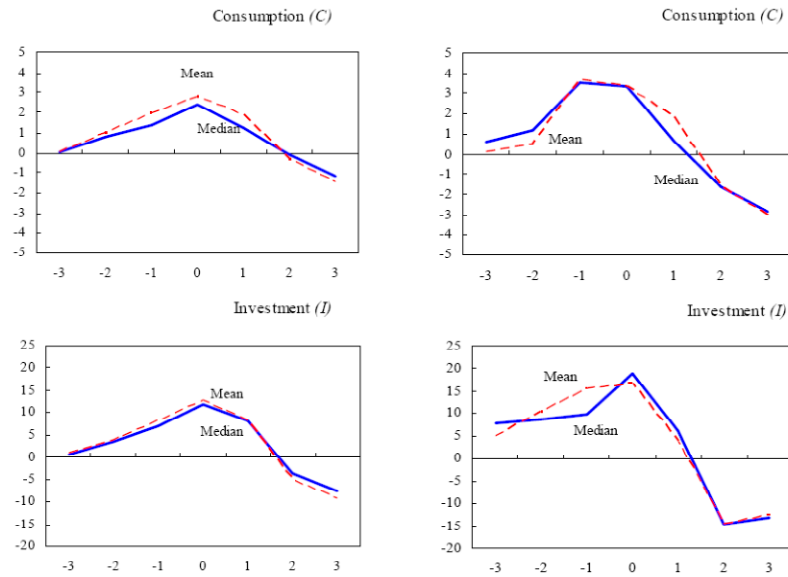
Credit cycles in absorption

(Cross-country means and medians of cyclical components)



Industrial Countries

Emerging Economies



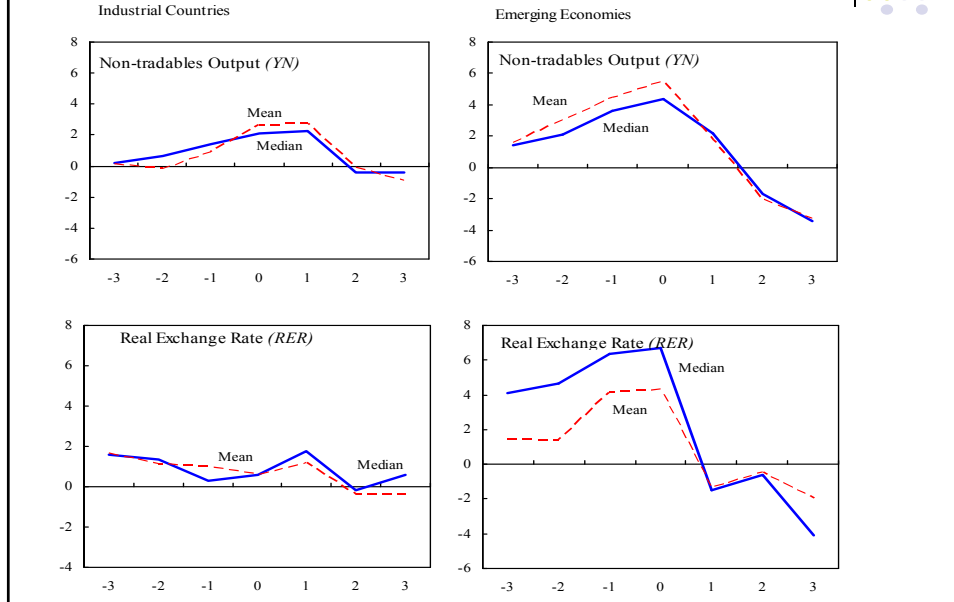
CB & Output/Absorption Booms



	Industrial Countries	Emerging Economies
Output	0.49	0.46
Non-tradable output	0.31	0.46
Consumption	0.49	0.46
Investment	0.60	0.34

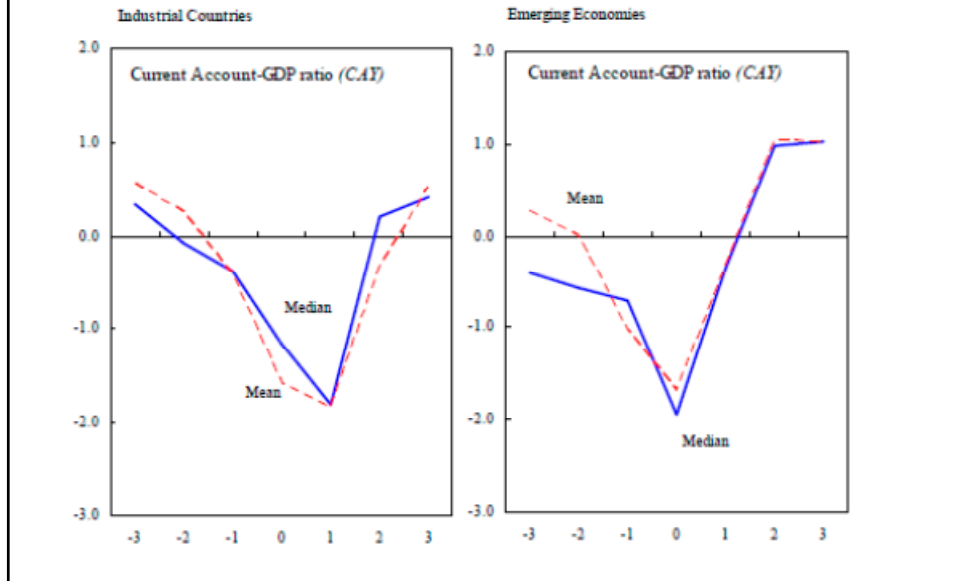
Credit cycles in YN & RER

(Cross-country means and medians of cyclical components)



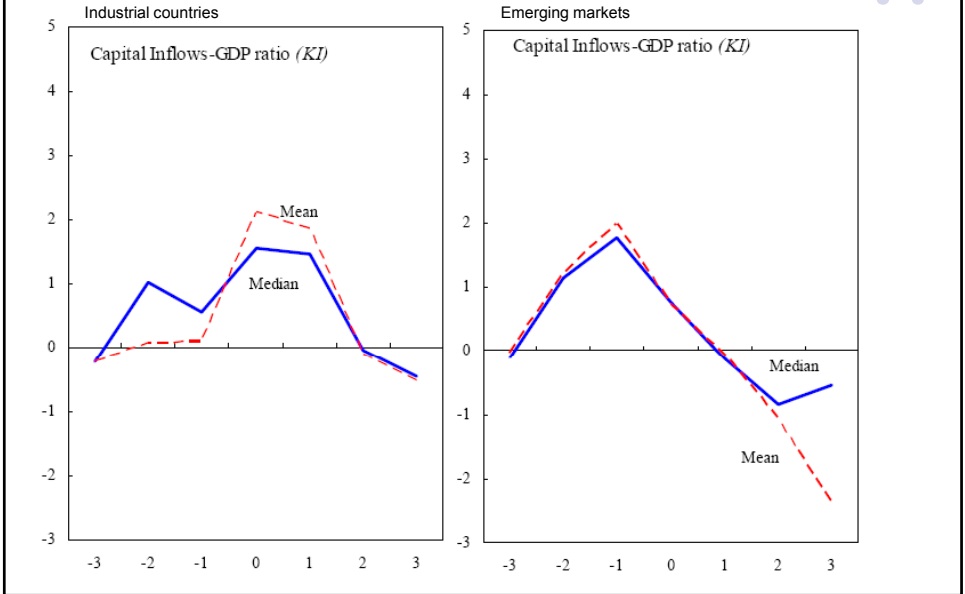
Credit cycles in the current account

(Cross-country means and medians of cyclical component of CA)



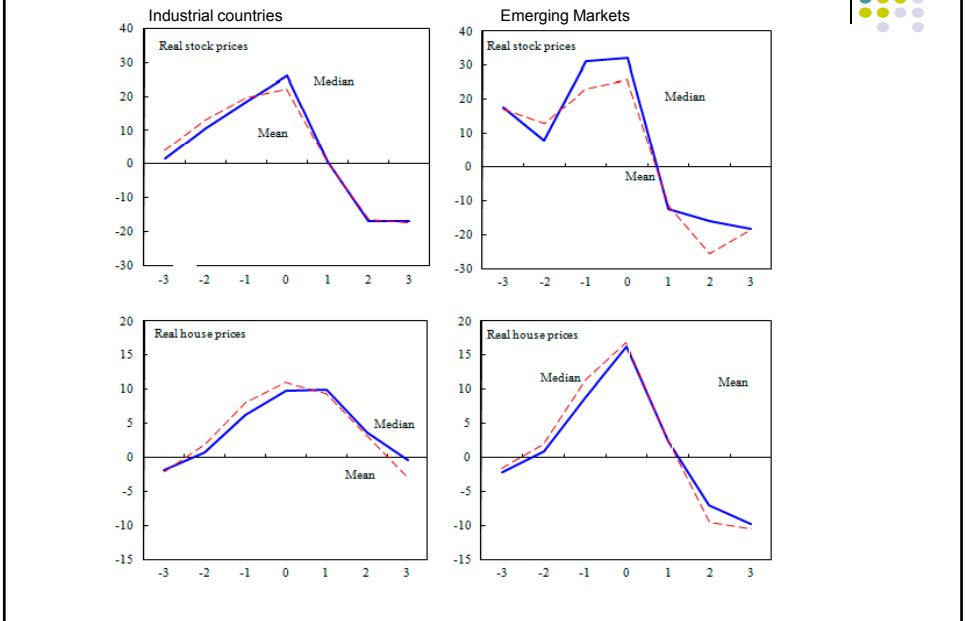
Credit cycles in net capital inflows

(Cross-country means and medians of cyclical component)



Credit cycles in asset prices

(Cross-country means and medians of cyclical component)

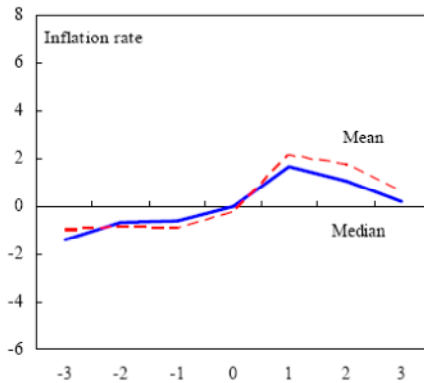


Credit cycles and inflation

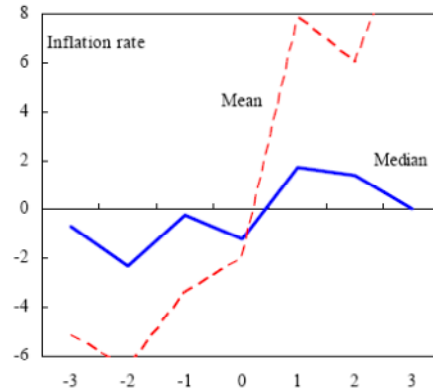
(Cross-country means and medians of cyclical component)



Industrial Countries



Emerging Markets



Credit cycles: regional features

(Cross-country medians of cyclical component)



1. Industrial Countries: G7 vs Nordic Countries

		t=0
Real credit	G7	8.421
	Nordic	19.280
Output (Y)	G7	2.886
	Nordic	3.679
Non-tradable Output (YN)	G7	2.011
	Nordic	2.533
Consumption (C)	G7	2.380
	Nordic	3.306
Investment (I)	G7	9.988
	Nordic	16.522
Real Exchange Rate (RER)	G7	-3.049
	Nordic	3.600
Current Account-GDP ratio (CAY)	G7	-1.161
	Nordic	-0.598

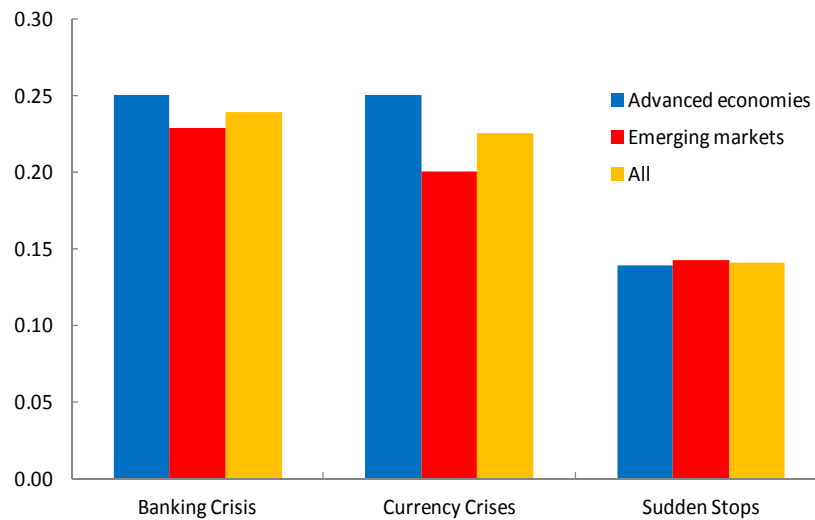
Credit cycles: regional features

(Cross-country medians of cyclical component)

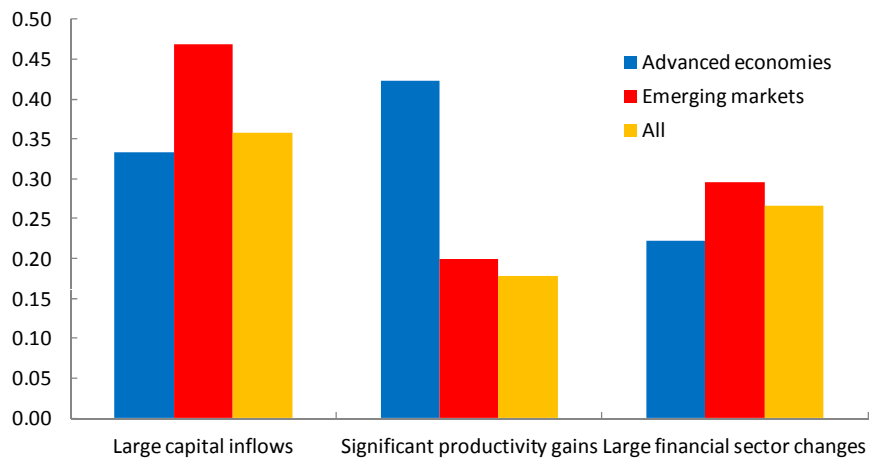


2. Emerging Economies: Latin America (LA) vs Asia vs Transition		
		t=0
Real credit	LA	51.891
	Asia	24.175
	Transition	23.218
Output (<i>Y</i>)	LA	7.729
	Asia	5.727
	Transition	7.081
Non-tradable Output (<i>Y_N</i>)	LA	10.031
	Asia	4.387
	Transition	4.632
Consumption (<i>C</i>)	LA	8.541
	Asia	2.230
	Transition	2.381
Investment (<i>I</i>)	LA	20.947
	Asia	18.064
	Transition	20.471
Real Exchange Rate (<i>RER</i>)	LA	9.238
	Asia	6.725
	Transition	6.582
Current Account-GDP ratio (<i>CAY</i>)	LA	-2.299
	Asia	-2.233
	Transition	-1.789

Financial crises after credit boom peaks (frequency analysis)



Credit booms and potential triggers (frequency analysis)

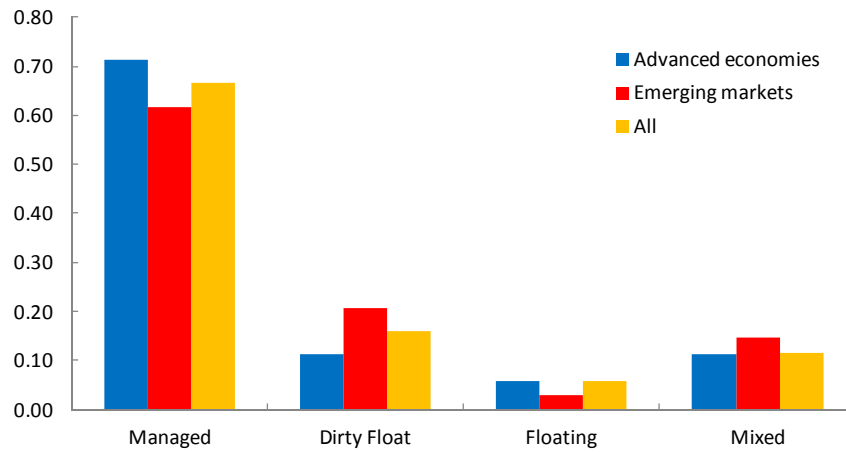


Logit analysis of CB triggers

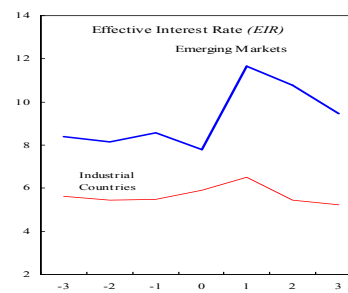
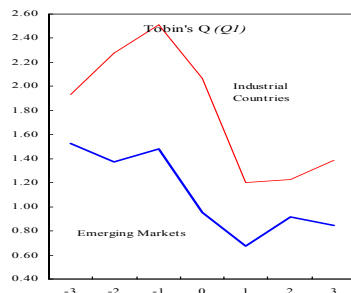
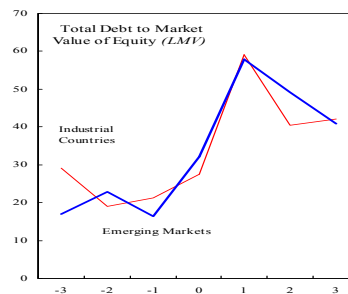
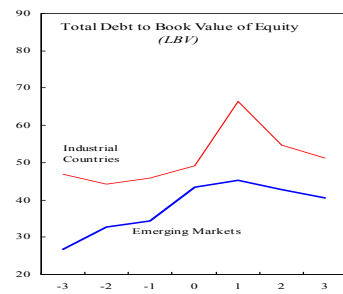


Explanatory Variables	(1)	(2)	(3)	(4)
Lagged Net Capital Inflows (percent of GDP, five-year average of yearly changes)	0.305*** [0.107]			0.319*** [0.116]
Lagged Financial Sector Reform (five-year average of yearly changes)		0.152 [0.266]		0.124 [0.278]
Lagged Total Factor Productivity Growth (five-year average)			0.109* [0.060]	0.024 [0.062]
Lagged Total Factor Productivity Growth x Advanced Country Dummy				0.392** [0.173]
Advanced Country Dummy				0.113 [0.295]
Constant	-3.460*** [0.116]	-3.468*** [0.166]	-3.473*** [0.128]	-3.707*** [0.204]
<i>Memorandum</i>				
Number of Observations	1244	1244	1244	1244
Log Likelihood	-173.04	-176.69	-175.69	-169.616
AUC	0.64	0.50	0.62	0.68

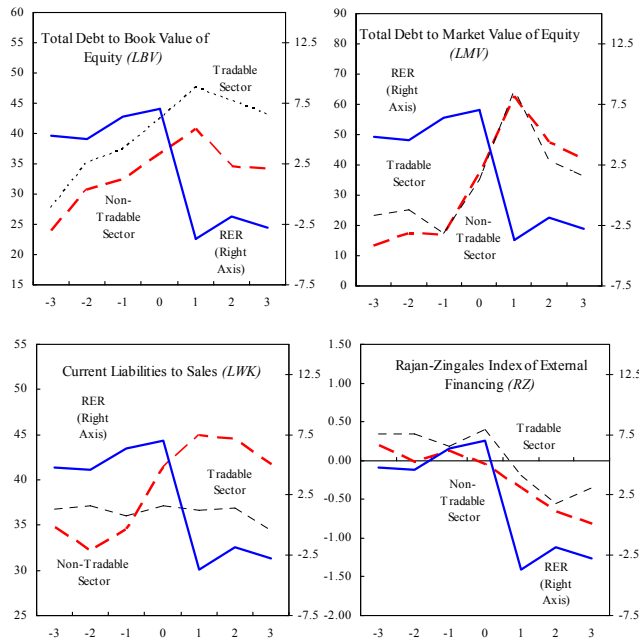
Credit booms and exchange rate regimes (frequency analysis)



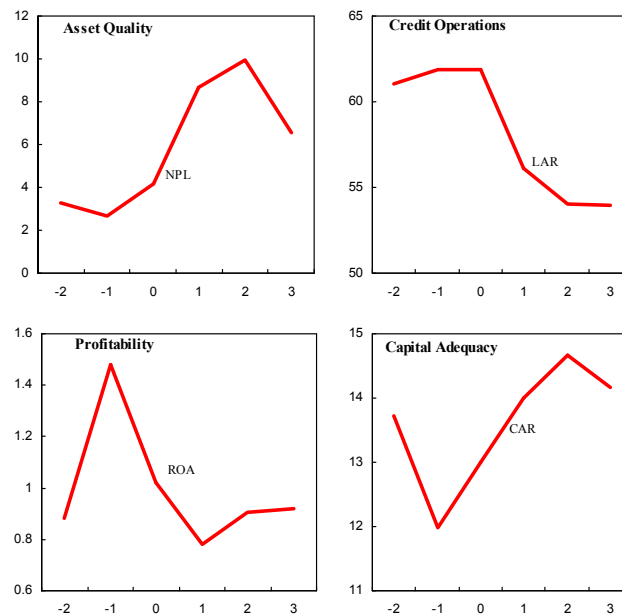
Micro credit cycles: corporate financial indicators (firm-level medians averaged across countries)



EM corporations: Tradables v. Nontradables



Bank-level indicators



Conclusions



- M-T method to study CBs in a sample of 61 countries for 1960-2010 period yields six main findings
 1. 35 CBs in ICs and 35 in EMs, aggregate frequency: 2.8%
 2. Similar size, duration and macro fluctuations, w. regional diffs.
 3. CBs associated with surges in capital inflows, large TFP gains, fin. reforms, and managed exchange rates
 4. CBs followed by financial/currency/SS crises
 5. CBs aligned with fluctuations in firm-level fin. indicators
 6. CBs aligned with changes in banking fragility
- These are stylized facts that need to be explained (both upswing and downswing of credit booms matter)
- Monitoring tool for tracking CBs & macro/micro finance linkages