Investing in Local Currency Bond Markets

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Motivation: A Tale of Two Crises

- Late 1990s: Emerging Asia, Russia, Argentina
  - Underdeveloped local currency bond markets (LCBMs) led to currency mismatches.
  - Reliance on foreign currency debt linked to increased likelihood and severity of financial crises.
  - Debate over Original Sin
  - For investors LCBMs off the radar, not a serious asset class.

- Recent global crisis linked in part to global imbalances.
  - CFG (2008)-lack of reliable financial inst. in EMs drove flows to developed markets esp. US/UK (also MQRR 2009)

- So the development of LCBMs should lead to improved financial stability in *individual countries*, but also perhaps has implications for *global* financial stability.

Motivation: Key Questions

1. How have LCBMs evolved in the past decade? To what extent have currency mismatches been reduced? What are the returns characteristics of these markets?

2. To what extent are cross-border investors willing to participate in LCBMs? Are EMs now able to borrow from abroad in local currency?

3. What factors are related to cross-border participation?

4. What are the implications for global financial stability?

What we do: addressing the key questions

- Document the evolution (2001-2008) of LCBM development across a wide range of countries.
  - Examine amounts outstanding as well as returns characteristics (from the perspective of a global, USD-based investor)
- Analyze cross-border investment in LCBMs
  - Because of a dearth of quality data on cross-border investment in bonds, limit the focus to U.S. investors' positions in LCBMs. (Not optimal, but data limitations are severe.)
  - Focus on the roles of investability, the mean variance and skewness of expected returns, and potential diversification benefits.
- Discuss implications for global financial stability.

Preview of main results

- Original Sin is dead.
  - LCBM development has proceeded quite nicely across a wide range of emerging markets.
  - Foreign participation in EM LCBM is on the rise.
- Emerging LCBMs have reasonably attractive returns characteristics (although negative skewness in some).
- Countries with greater investability (to be defined below) have greater cross-border investment in their LCBMs.
- Thus, one path to improved global financial stability goes through investability.

Description of LCBM Development, Returns Characteristics, and US Investment

- 1. LCBM Development
  - Advanced Economies: High growth in the 2000s, exceptionally so in some countries (Ireland, Italy, Spain, Iceland before its crash). Currency mismatch not a problem in most countries (notable exception is Iceland).
  - Emerging Markets: Some growth, especially in mid-2000s. Importantly, currency mismatches becoming less severe in most countries.
- 2. Returns Characteristics: Pre-crisis but also during the crisis emerging LCBs had reasonably attractive returns characteristics (high mean, low corr w/ US, vol and neg skew but not exorbitant).
- 3. U.S. Investment in LCBMs: US investors have reduced their positions in advanced economies (especially in some eurozone countries, but have increased investment in emerging LCBMs.

1a. LCBM Development (Advanced Economies):

High growth in the 2000s, exceptionally so in some countries (Ireland, Italy, Spain, Iceland before its crash). Currency mismatch not a problem in most countries (notable exception is Iceland).

	Local Currency Denominated Bonds					
	% of GDP			% of Total		
	2001	2006	2008	2001	2006	2008
ADVANCED ECONOMIES	**105**	**130**	**137**	**93**	**91**	**90**
USA	**130**	**150**	**162**	**98**	**96**	**96**
Euro Area	**96**	**139**	**140**	**89**	**91**	**92**
Germany	95	118	102	92	91	90
Greece	74	106	111	89	97	98
Ireland	46	235	336	65	74	78
Italy	119	162	171	96	97	98
Portugal	65	110	133	90	98	100
Spain	60	156	169	93	97	97
Other	**81**	**100**	**106**	**87**	**82**	**81**
Denmark	138	177	174	88	85	85
Iceland	91	396	104	66	60	27
Japan	110	158	187	99	99	99

1b. LCBM Development (Emerging Markets):

Some growth, especially in mid-2000s. Importantly, currency mismatches becoming less severe in most countries.

	% of GDP			% of Total		
	2001	2006	2008	2001	2006	2008
EMERGING ECONOMIES	**19**	**24**	**23**	**70**	**81**	**85**
Europe	**17**	**20**	**14**	**64**	**72**	**70**
Latin America	**16**	**19**	**16**	**51**	**67**	**72**
Argentina	14	30	17	29	50	49
Brazil	20	15	16	59	69	79
Chile	45	24	23	77	71	75
Mexico	16	26	24	59	79	81
Asia	**23**	**29**	**31**	**90**	**93**	**95**
China	18	28	32	95	98	99
India	26	32	30	97	95	92
Indonesia	27	15	10	96	87	80
Malaysia	57	61	67	77	79	86
Philippines	22	27	21	48	50	53
Thailand	30	51	52	81	92	95

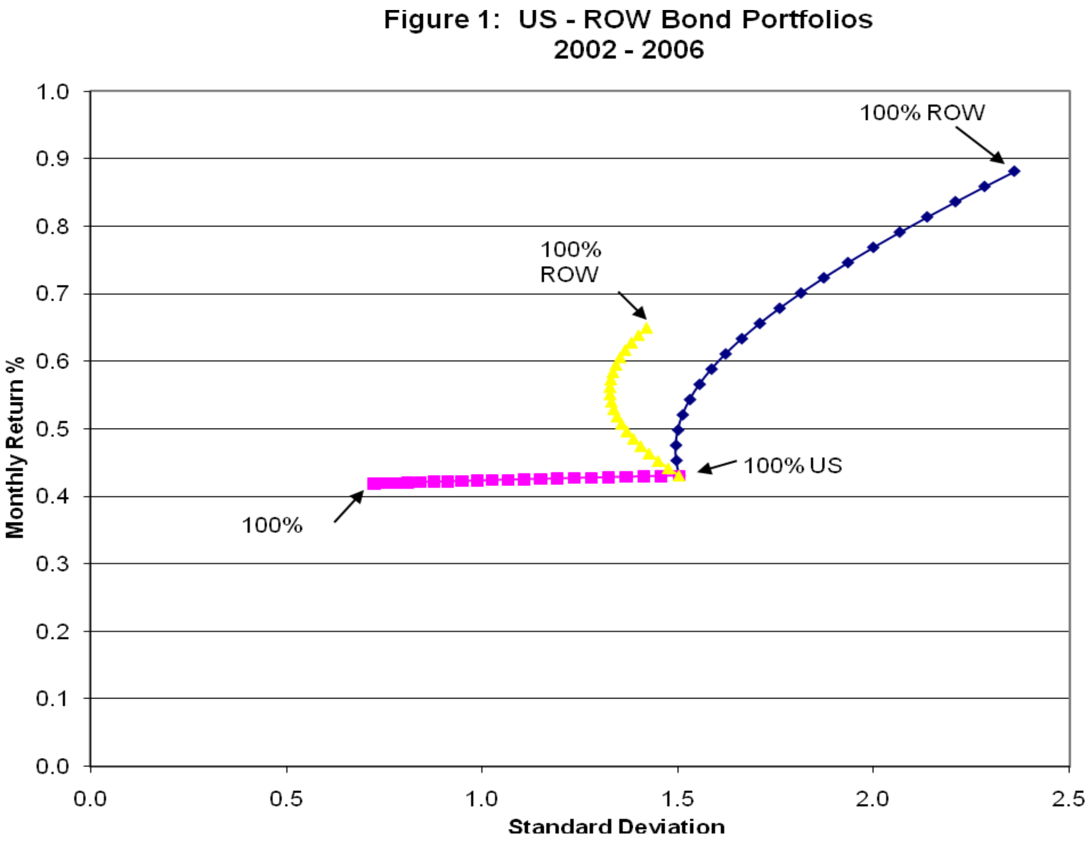
2a. Returns Characteristics:

Pre-crisis but also during the crisis emerging LCBs had reasonably attractive returns characteristics (high mean, low corr w/ US, vol and neg skew but not exorbitant).

	Mean Monthly Return (%)	Variance	Skewness	Correlation with U.S. returns
Pre-Crisis (2002 to 2006)				
U.S. Bonds	0.40	2.34	-0.70	
Industrial Countries	1.04	6.60	0.79	0.42
Emerging Markets	1.22	4.21	-0.30	0.23
Crisis Period (2007-2009)				
U.S. Bonds	0.52	2.96	0.44	
Industrial Countries	0.60	9.72	-0.17	0.60
Emerging Markets	0.61	12.30	-0.75	0.09

2b. Returns Characteristics:

In the mid-2000s, foreign bonds had very favorable returns characteristics. This is, however, sample dependent (depending in particular on whether USD is appreciating or depreciating).



3. U.S. Investment in LCBMs:

US investors have reduced their positions in advanced economies (especially in some Eurozone countries), but have increased investment in emerging LCBMs.

	2001	2006	2008			2001	2006	2008
EMERGING ECONOMIES	**0.17**	**0.81**	**0.81**		**ADVANCED ECONOMICS**	**1.17**	**0.93**	**0.81**
Europe	**0.51**	**1.08**	**0.96**		**Euro Area**	**1.37**	**0.72**	**0.65**
Hungary	1.15	1.20	2.56		France	1.34	1.18	0.88
Poland	1.46	3.35	2.27		Germany	2.12	1.12	1.47
Latin America	**0.15**	**2.03**	**2.60**		Greece	1.42	0.41	0.21
Argentina	0.20	3.73	0.61		Ireland	1.01	1.13	0.58
Brazil	0.07	2.93	3.32		Italy	0.72	0.20	0.22
Chile	0.04	0.00	0.04		Netherlands	1.19	0.87	0.64
Mexico	0.27	0.85	1.53		Portugal	0.22	0.14	0.07
Asia	**0.01**	**0.21**	**0.23**		Spain	1.56	0.19	0.14
China	0.00	0.00	0.01		**Other**	**1.00**	**1.20**	**1.02**
India	0.00	0.00	0.00		Australia	2.84	1.95	2.26
Indonesia	0.01	2.01	3.47		Canada	4.38	4.79	4.91
Malaysia	0.03	1.10	1.75		Singapore	0.13	4.41	1.94
Philippines	0.05	0.14	0.13		South Korea	0.06	0.26	0.44
Thailand	0.08	0.54	0.34		Sweden	2.93	2.25	1.20

Model of US investment in country *i*'s LCBM

$$\upsilon_i^{US} = f(\overset{+}{x}, \overset{-}{V}_x, \overset{+}{S}_x, \overset{-}{Barriers}, \overset{-}{Corr})$$

υ_i^{US} is the percentage of country *i*'s local currency bond market held by US investors;

x_i, V_i, and S_i are the expected mean, variance, and skewness of returns;

Barriers is a measure of impediments to cross-border investment in country *i*'s LCBM;

Corr is the correlation of the bond returns of country *i* with U.S. bond returns.

Factor 1: Expected Mean Var and Skew

- We posit that global LCBM investors have a 1yr horizon and so predict one year expected mean var and skew of each country's returns.
- Methodology: System GMM (Blundell and Bond 1998)

$$y_{it} = \sum_{j=1}^{p} \alpha_j y_{i,t-j} + x_{it}\beta_1 + w_{it}\beta_2 + \nu_i + \varepsilon_{ti}$$

Factor 1: Modeling E(Mean), E(Var), and E(Skew)

Higher mean returns predicted by higher yields, lower inflation, and larger CAB.

Variance and Skewness best predicted by own lags.

DepVar:	Mean	Stdev	Skew
DepVar			
Lag1	0.346*	0.089*	-0.173**
Lag2	0.837***	0.030	0.211***
yield	0.007***		
Lag1	0.001		
Lag2	-0.000		
exchange rate	0.088***		
Lag1	0.114***		
Lag2	0.016**		
inflation	-0.001***		
Lag1	-0.000		
Lag2	-0.000		
current account balance	0.001**		0.027
Lag1	-0.000		0.045*
Lag2	0.001		-0.081***
GDP growth	-0.000		
Lag1	-0.000		
Lag2	0.001*		
#observations	210	479	244
#groups	39	39	39
Wald	130	3.17	29.85
correlation of predicted w/actual	0.38	0.47	0.25

Factor 2: LCBM Investability (inverse of *Barriers*)

- Capital Controls (25%)
- Liquidity and efficiency (25%)
- Regulatory Quality and Creditor Rights (15%)
- Market Infrastructure (15%)
- Taxation (10%)
- Domestic Investor Base (10%)

- Crisil (2008, 2009) provides for 20 Gemloc countries (34 in 2009 report). We supplement for industrial countries.

Tobit regression analyzing determinants of US investment in country *i*'s LCBM

$$\upsilon_i^{US} = \alpha_0 + \alpha_1 Investability_i + \alpha_2 x_i + \alpha_3 V_i + \alpha_4 S_i + corr_i + \varepsilon_i$$

υ_i^{US} is the percentage of country *i*'s local currency bond market held by US investors;

$Investability_i$ is a measure of country *i*'s investability;

x_i, V_i, and S_i are the expected mean, variance, and skewness of returns;

$corr_i$ is the correlation of the bond returns of country *i* with U.S. bond returns.

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Main Results:
US investment in LCBM is higher in countries where investor-friendly institutions and policies have been established.

2008 Regressions

Investability Measure:	Aggregate	CA Open	Liq Eff	Reg_CR	Mkt St	Tax	DomInv
Investability	0.0518**	0.0994**	0.200**	0.280**	0.293***	0.0921	0.384**
	(0.0202)	(0.0463)	(0.0823)	(0.124)	(0.102)	(0.115)	(0.143)
exp_mean08	0.0353	0.0735	-0.0858	0.0923	-0.0562	0.00527	0.0223
	(0.165)	(0.190)	(0.183)	(0.185)	(0.136)	(0.211)	(0.128)
exp_sd08	1.159	0.441	2.140	1.058	1.741	0.850	1.473
	(1.155)	(1.061)	(1.271)	(1.253)	(1.131)	(1.044)	(1.251)
exp_skew08	0.0156	0.0150	0.0185	0.0140	0.0211	0.0181	0.0180
	(0.0129)	(0.0139)	(0.0135)	(0.0128)	(0.0124)	(0.0141)	(0.0123)
corr3yr08	-0.0312*	-0.0189	-0.0392*	-0.0217	-0.0369**	-0.0149	-0.0283**
	(0.0166)	(0.0146)	(0.0197)	(0.0137)	(0.0163)	(0.0136)	(0.0132)
Observations	36	36	36	36	36	36	36

On Global Financial Stability: Investability in the BRICs

Small LCBMs, and much room for improvement in investability categories. Path forward is clear enough.

	Brazil	Russia	India	China	Top Score	
Local Currency Bonds (% GDP)	16	3	30	32	67	Malaysia
Investability Scores						
CA Openness	44	75	49	29	100	Hungary
Liquidity/Efficiency	66	63	64	69	75	Malaysia
Reg./Creditor Rights	46	50	57	50	84	Slovakia
Market Infrastructure	66	58	68	44	75	South Africa
Taxation	55	100	31	83	100	Hungary
Dom Investor Base	80	40	50	60	90	South Africa

Summary

- Original Sin is dead.
  - LCBM development has proceeded quite nicely across a wide range of emerging markets.
  - US investors have increased holdings in emerging LCBMs.

- Emerging LCBMs have reasonably attractive returns characteristics (although negative skewness in some).

- Countries with greater investability have greater cross-border investment in their LCBMs.

- One path to improved global financial stability goes through investability (LCBM development helps address global asset shortage and foreign participation helps reduce imbalances).