Emerging Local Currency Bond Markets

by

John D. Burger Sellinger School of Business, Loyola University Maryland

Francis E. Warnock Darden Business School, University of Virginia NBER, IIIS, Dallas Fed

Veronica Cacdac Warnock Darden Business School, University of Virginia

Macro/Finance Group 9th Research Meeting National Institute of Public Finance & Policy March 15-16, 2012

Earlier version "Investing in Local Currency Bond Markets" NBER Working Paper 16249 (August 2010)





Motivation

- » From the investment perspective
 - > Even in 1990s, local currency bond markets (LCBMs) were off investors' radar, were not a serious asset class.
- » From the financial development perspective
 - > Underdeveloped LCBMs led to currency mismatches (assets in local currency, debts in foreign currency).
 - > Reliance on foreign currency debt linked to increased likelihood and severity of financial crises.
 - > Original sin hypothesis raised the possibility that the underdevelopment of LCBMs would never change.



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 EMEs now able to borrow from abroad in local currency?
- 3. What factors are related to cross-border participation?



What we do: Addressing the key questions

- » Document the evolution (2001-2008) of LCBM development across a wide range of countries.
 - > Examine size (amounts outstanding, as % of GDP, as % of all bonds) as well as returns characteristics (mean variance skewness 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.





An Aside: Bond Market Development and Original Sin

- Original Sin is "... a situation in which the domestic currency cannot be used to borrow abroad or to borrow long term, even domestically." --Eichengreen & Hausmann (1999)
- Original Sin Hypothesis implies that developing countries suffer from currency mismatch through no fault of their own —
 Eichengreen, Hausmann, and Panizza (2002) find that original sin is exogenous to a country's current conditions — and countries can do nothing to improve the situation.



It's Not Original, Just Sin: Countries with high inflation volatility and poor protection of legal rights have smaller bond markets



Similar findings in Burger & Warnock (2006); Claessens, Klingebiel, & Schmukler (2007); BIS (2007); Eichengreen & Pipat (2008); others



Description of LCBM Development, Returns Characteristics, and US Investment

- 1. LCBM Development
 - > Advanced Economies: High growth in the 2000s, perhaps too much in some countries (Ireland, Italy, Spain, Iceland before its crash). Currency mismatch not a problem in most advanced economies (notable exception is Iceland).
 - > Emerging Market Economies: Some growth, especially in mid-2000s. Importantly, currency mismatches becoming less severe in most countries.
- 2. Returns Characteristics: Emerging LCBs had attractive returns characteristics over the Jan02 to May11 period, and the returns characteristics were even favorable during the Aug07-May11 crisis period (although with higher volatility)
- 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. Local Currency Bond Market 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	at 90+	
ADVANCED ECONOMIES	105	130	137	93	91	90	(allow	
USA	130	150	162	98	96	96	excen	
Euro Area	96	139	140	89	91	92	скеер	
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. Local Currency Bond Market Development (EMEs): Some growth, especially in mid-2000s. Importantly, reduced reliance on foreign currency borrowing in most countries.

							norcont	
	% of GDP				% of Total			
	2001	2006	2008	2001	2006	2008	for some	
							exception	
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	Prograss is	
Brazil	20	15	16	59	69	79	heing mad	
Chile	45	24	23	77	71	75	being maa	
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		





Would like to see this

at 90+

1c. Local Currency Bond Market Development:
Evolution of Maturities in EME bonds
EMEs now able to issue longer maturity local currency bonds.

	Domestic Central Government Debt Outstanding								
	Origina	Maturity	/ (years)	Remaining Maturity (year					
	2001	2006	2008	2001	2006	2008			
Emerging									
Europe	4.0	6.1	7.2	2.8	3.8	3.9			
Latin America	5.1	13.7	14.5	3.0	4.0	4.9			
Asia	10.6	13.0	11.9	4.6	7.8	7.9			

Source: BIS





2. Returns Characteristics:

Emerging LCBs had attractive returns characteristics over the Jan02 to May11 period, and the returns characteristics were even favorable during the Aug07-May11 crisis period (although with higher volatility)

	Mean (%)	Variance	Skewness	Correlation with US Govt Bonds
Jan 2002 to May 2011				
EMEs				
Unhedged	1.01	5.50	-0.54	0.16
Hedged	0.46	0.98	0.78	0.45
AEs				
Unhedged	0.81	6.85	0.00	0.53
Hedged	0.39	0.80	-0.07	0.91
US Corporate Bonds	0.59	2.45	-0.45	0.57
EME Equities	1.66	50.85	-0.87	-0.20
Aug 2007 to May 2011				
EMEs				
Unhedged	0.61	9.96	-0.42	0.20
Hedged	0.36	2.05	1.35	0.50
From Table 3 of paper.				





3. U.S. Investment in LCBMs:

US investors have reduced their positions (as a percent of outstanding) 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 ECONOMIES	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

Note that US EME holdings : US AE holdings were about 1:100 (1.1%) in 2001, but 1:10 (10.3%) by 2008.



LCBM Development, Returns Characteristics, and US Investment

1. Local Currency Bond Market Development

- > Advanced Economies: High growth in the 2000s, perhaps too much in some countries (Ireland, Italy, Spain, Iceland before its crash). Currency mismatch not a problem in most Advanced Economies (notable exception is Iceland).
- > Emerging Markets: Some growth, especially in mid-2000s. Importantly, currency mismatches becoming less severe in most countries.
- 2. *Returns Characteristics*: Emerging LCBs had attractive returns characteristics over the Jan02 to May11 period, and the returns characteristics were even favorable during the Aug07-May11 crisis period (although with higher volatility)
- 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.

What explains the amount of US investment in a country's LCBM?



Model of US investment in country i's LCBM

$$v_i^{US} = f(x, V_x, S_x, Barriers, Corr)$$

 v_i^{US} is 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. Gets at a potential **diversification** motive.





Factor 1: Expected Mean, Var, and Skew

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

$$y_{it} = \sum_{j=1}^{p} \alpha_{j} y_{i,t-j} + x_{it} \beta_{1} + w_{it} \beta_{2} + v_{i} + \varepsilon_{ti}$$



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

Higher mean returns predicted by higher yields; more positive, larger CAB; and slower growth (or lower inflation).

Variance and Skewness best predicted by own lags.

DepVar:	Mean	Standard deviation	Skewness
DepVar			
Lag 1	-0.226***	0.084*	-0.173**
Lag 2			0.211***
Yield	0.005***		
Lag 1	-0.000		
Inflation	0.000		
Lag 1	0.001		
Current Account Balance	0.001***		0.027
Lag 1	-0.000		0.045
Lag 2			-0.081***
GDP Growth	-0.001**		
Lag 1	-0.000		
# observations	275	520	244
# groups	41	41	39
Wald Statistic	87.8***	3.3*	29.9***
Correlation of predicted and actual	0.504***	0.513***	0.251***





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

$$\upsilon_{i}^{US} = \alpha_{0} + \alpha_{1} Investability_{i} + \alpha_{2} x_{i} + \alpha_{3} V_{i} + \alpha_{4} S_{i} + \alpha_{5} corr_{i} + \varepsilon_{i}$$

 v_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





Main Results:

2008 Regressions

US investment in LCBM is higher in countries where investor-friendly institutions and policies have been established. Also some (not very robust) evidence of diversification motive.

	A					-	
Investability Measure:	Aggregate	CA Open	Liq Eff	Reg_CR	MKt St	lax	DomInv
Investability	0.0510**	0.0884*	0.202**	0.261***	0.300***	0.0985	0.382***
	(0.0202)	(0.0495)	(0.0823)	(0.118)	(0.101)	(0.127)	(0.137)
	, <i>,</i>	. ,	. ,	. ,	. ,		. ,
exp_mean08	-0.0885	-0.0546	-0.205	0.017	-0.191	-0.106	-0.0201
	(0.232)	(0.251)	(0.275)	(0.238)	(0.208)	(0.286)	(0.196)
exp_sd08	1.159	0.832	2.404	1.393	2. 115	1.064	1.697
	(1.403)	(1.259)	(1.549)	(1.422)	(1.354)	(1.210)	(1.450)
exp_skew08	0.0161	0.0155	0.0195	0.0146	0.0211*	0.0184	0.0186
	(0.0124)	(0.0132)	(0.0134)	(0.0121)	(0.0123)	(0.0135)	(0.0121)
corr3yr08	-0.0360**	-0.0237	-0.0428**	-0.0249*	-0.0415**	-0.0194	-0.0302**
	(0.0173)	(0.0150)	(0.0202)	(0.0146)	(0.0162)	(0.0142)	(0.0142)
Observations	36	36	36	36	36	36	36





An Aside: On Global Financial Stability

- » Those results interesting enough—suggest what countries should do to attract outside investors, to be able to borrow in their own currencies.
- » The debate on the recent crisis and Global Imbalances suggests more implications of our work.
 - > In one view, the Global Savings Glut (Bernanke 2005) view
 - + Excess global savings funneled to US/UK financial centers, keeping long-term rates too low and fanning the flames of the bubble (that then burst).
 - > Savings Glut is mirrored by Global Asset Shortage
 - + Caballero, Farhi, and Gourinchas 2008 (CFG) suggest root cause of imbalances is shortage in many EMEs of sound & liquid financial instruments to serve as store of growing global wealth.
 - Asian crises damaged financial development in emerging markets. Deepest markets (US,UK) attracted bulk of flows.
- » Development of Local Bond Markets and ability of EMEs to attract outside investors could help address the global asset shortage.





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: Key Questions and Findings

1. How have LCBMs evolved in the past decade? To what extent have currency mismatches been reduced?

LCBM development has proceeded quite nicely across a wide range of emerging markets, reducing potentially damaging currency mismatches.

What are the returns characteristics of these markets?

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



Summary: Key Questions and Findings

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

US investors have increased holdings in emerging LCBMs.

3. What factors are related to cross-border participation? Countries with greater investability have greater cross-border investment in their LCBMs.

In addition, the implications for global financial stability are:

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



