Dollar credit and capital flows through EME non-financial corporates

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*The views expressed here are mine, not necessarily those of the Bank for International Settlements.
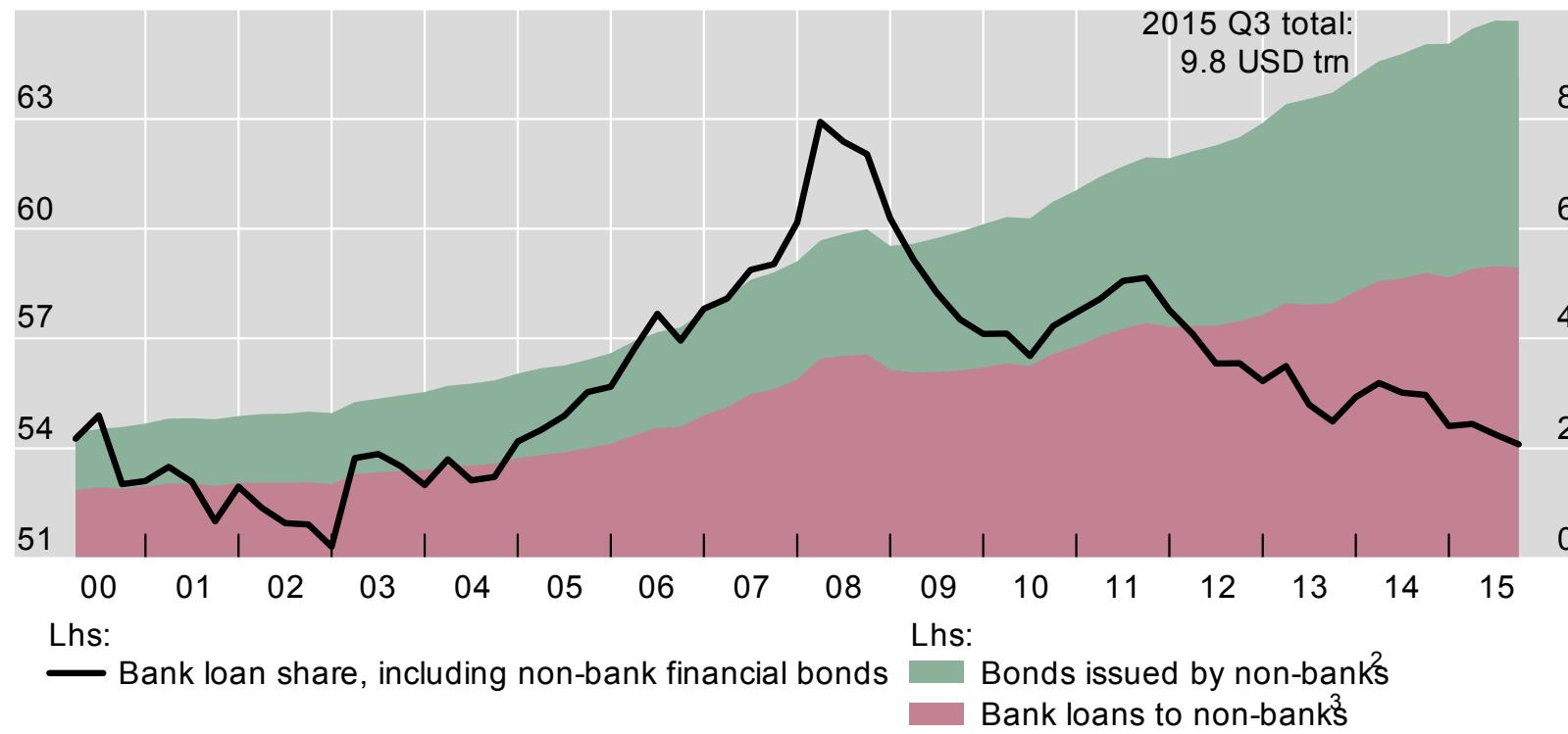
Figure 1. US dollar credit to non-banks outside the United States (Source: BIS global liquidity indicators)
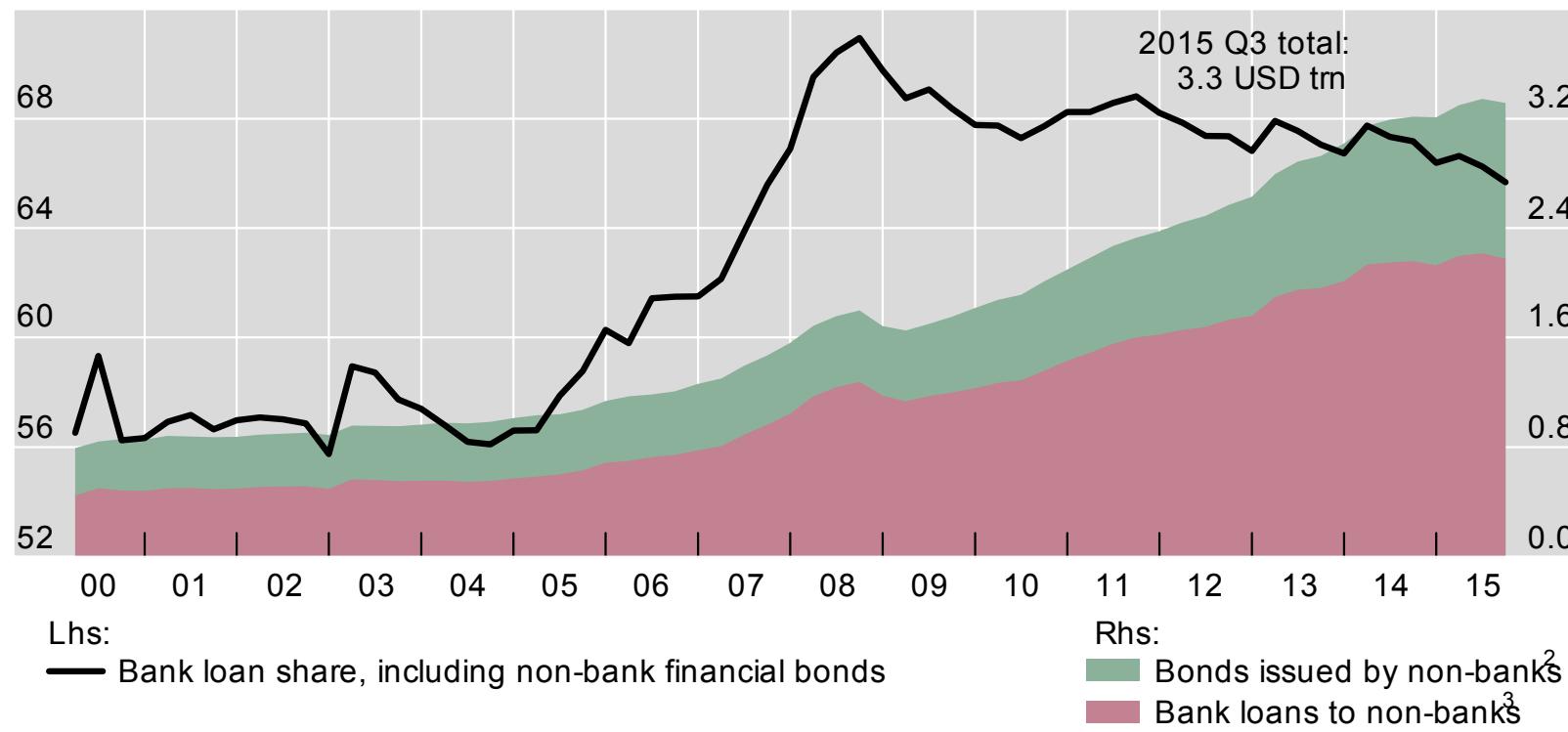
Figure 2. US dollar credit to non-banks in EMEs (Source: BIS global liquidity indicators)
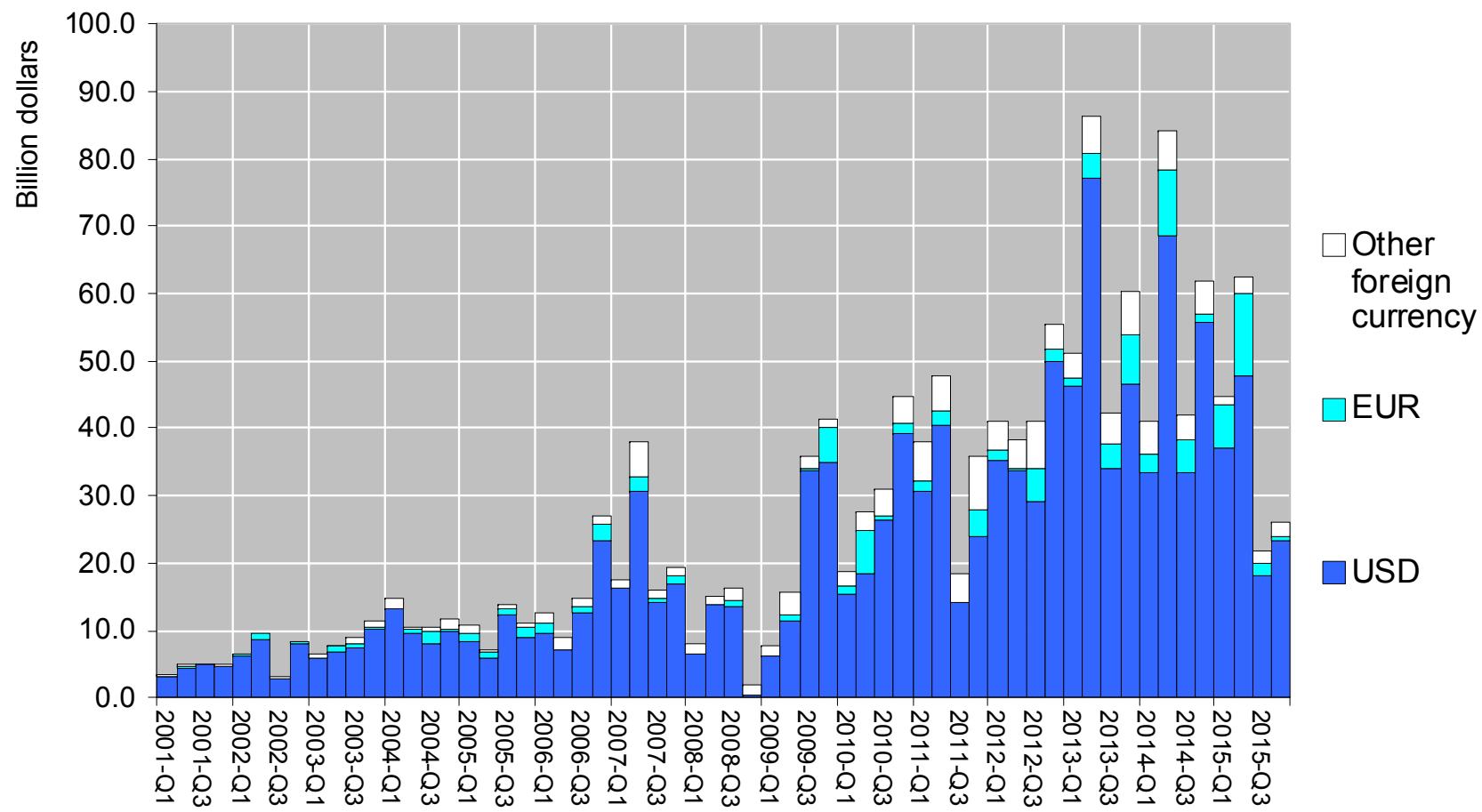
Figure 3. Gross issuance of international debt securities in foreign currency by EME non-financial corporates
(Source: BIS international debt securities statistics by nationality)

Why dollar bonds?

Why do so many non-US firms issue bonds denominated in US dollars?

Why dollar bonds?

Why do so many non-US firms issue bonds denominated in US dollars

- International role of the dollar for trade invoicing and transactions

  - Goldberg and Tille (2009), Chinn and Ito (2013), Gopinath (2015)
  - Mostly short-term (< 1 year) rather than long term

Why dollar bonds?

Why do so many non-US firms issue bonds denominated in US dollars

- International role of the dollar for trade invoicing and transactions

- Fund real assets and inventory of firms in tradeable sector

  - Cashflow in dollars, as invoicing is in dollars (eg. oil sector)
  - Spillover from invoicing role of dollar
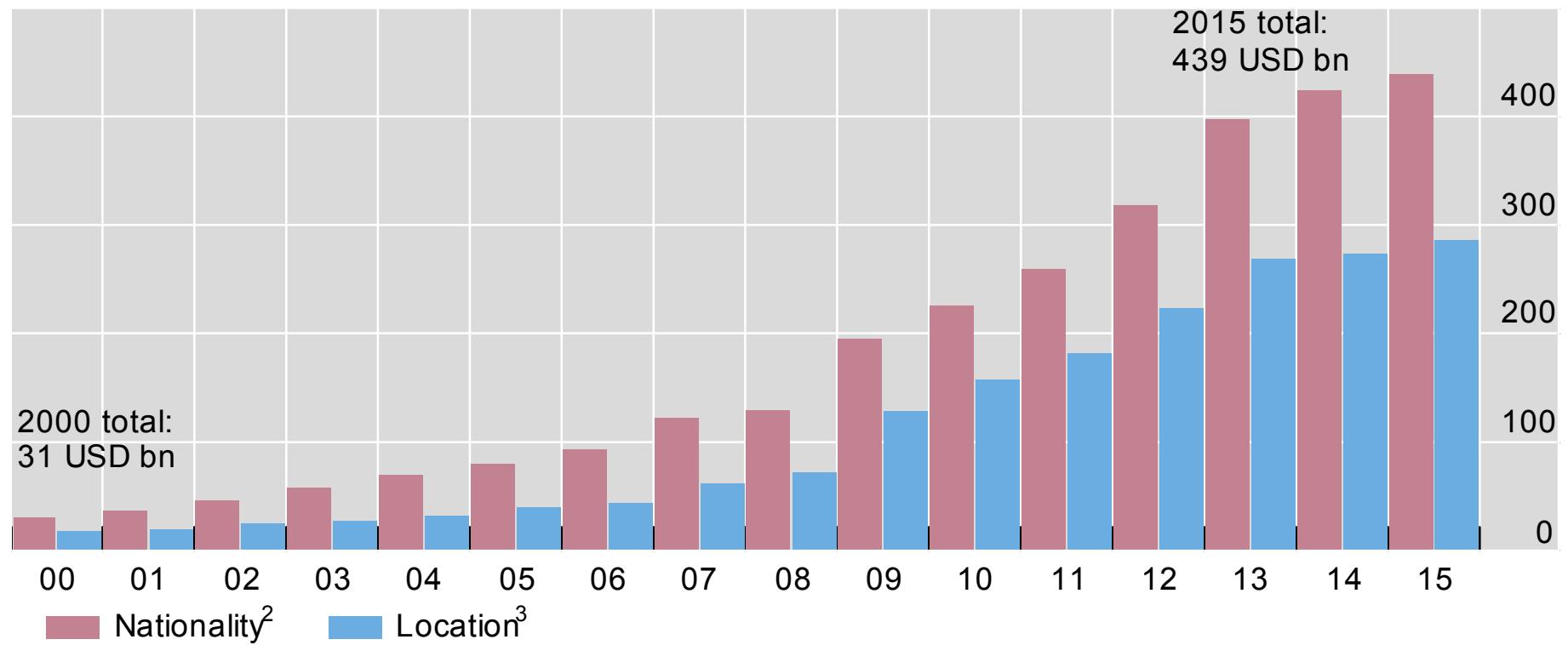
Figure 4. EME oil and gas sector international debt securities outstanding (Source: BIS international debt securities statistics)

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- International role of the dollar for trade invoicing and transactions

- Fund real assets and inventory of firms in tradeable sector

- Accumulate financial assets, too?
    - Cash and short-term financial assets in local currency
    - Way to circumvent capital controls
    - "Carry trades" by non-financial firms (Bruno and Shin (2015, 2016))

Rethinking traditional boundaries

- Traditionally, international finance rests on "triple coincidence" of

  - GDP boundary, which defines "external" vs "internal
  - Decision-making unit
  - Currency area

"Economic territory" 1   "Economic territory" 2

Output 1   Output 2
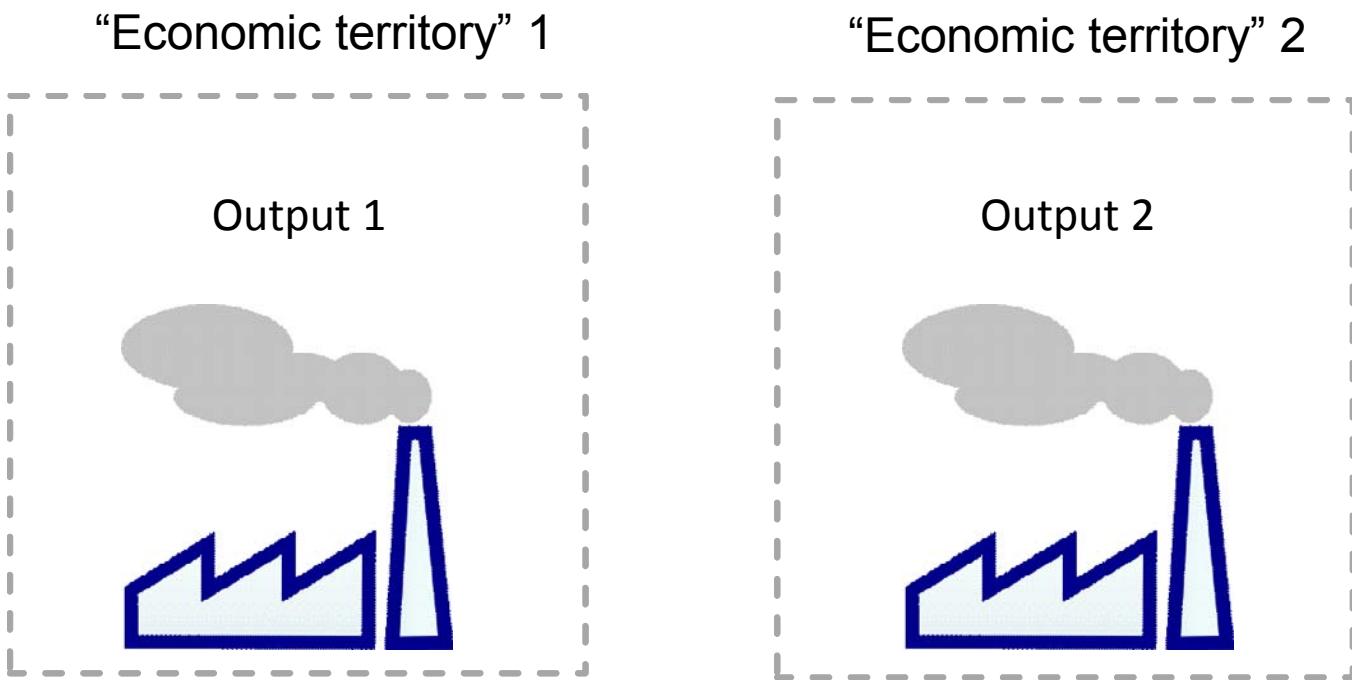
Figure 5. Boundary for national income accounting defines "economic territory"
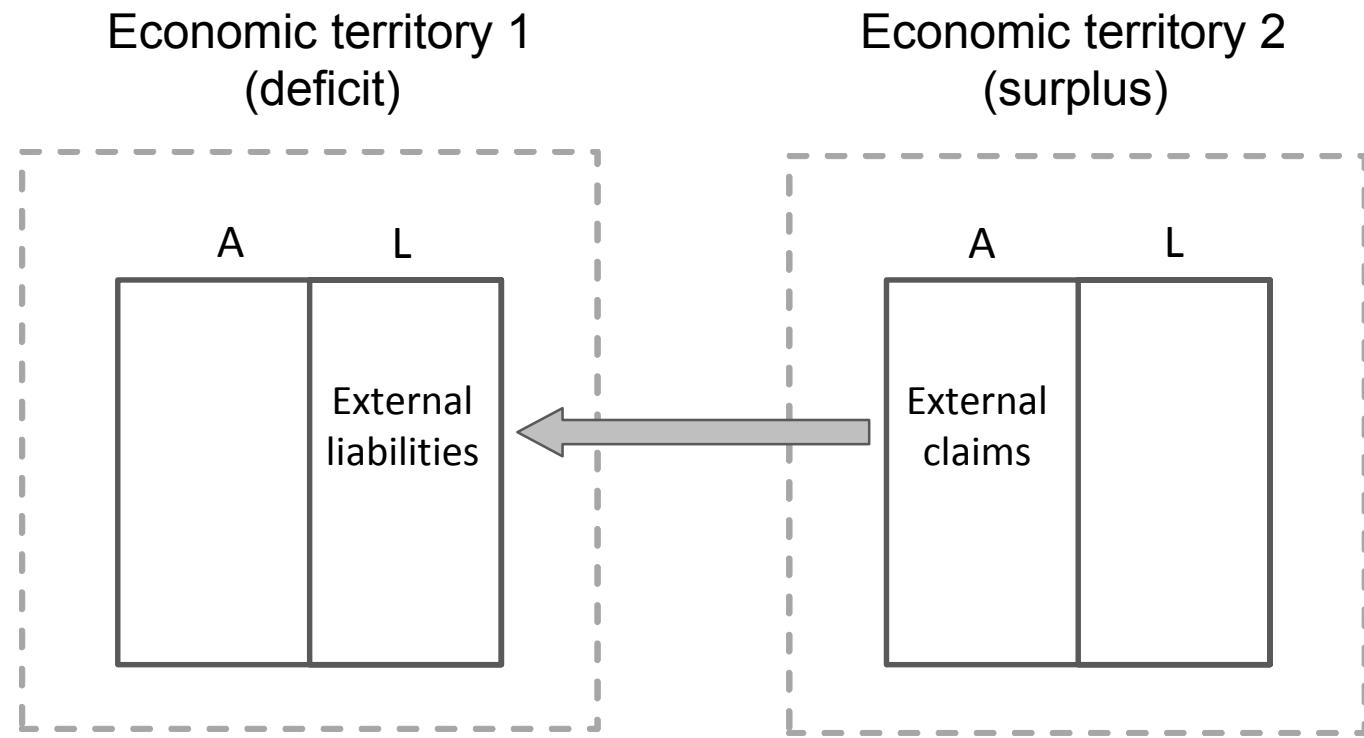
Figure 6. Boundary for national income accounting defines balance of payments and external claims/liabilities
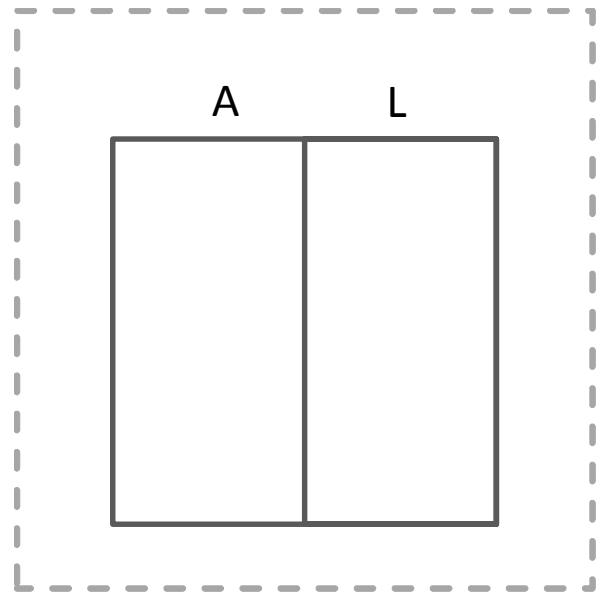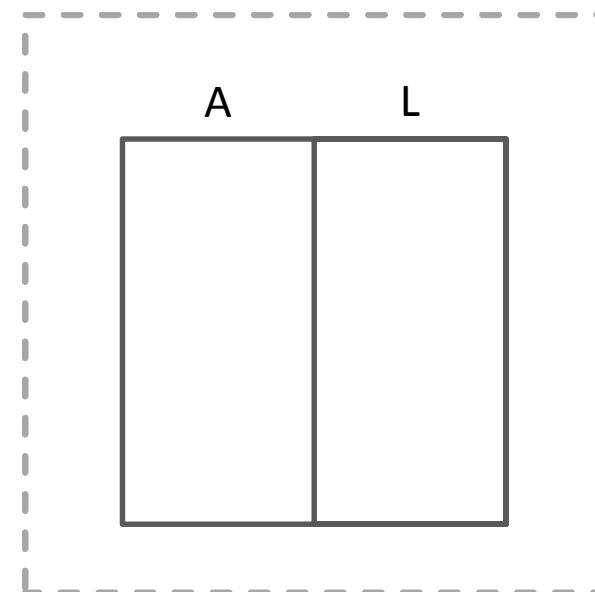
Figure 7. Boundary for national income accounting defines decision-making unit
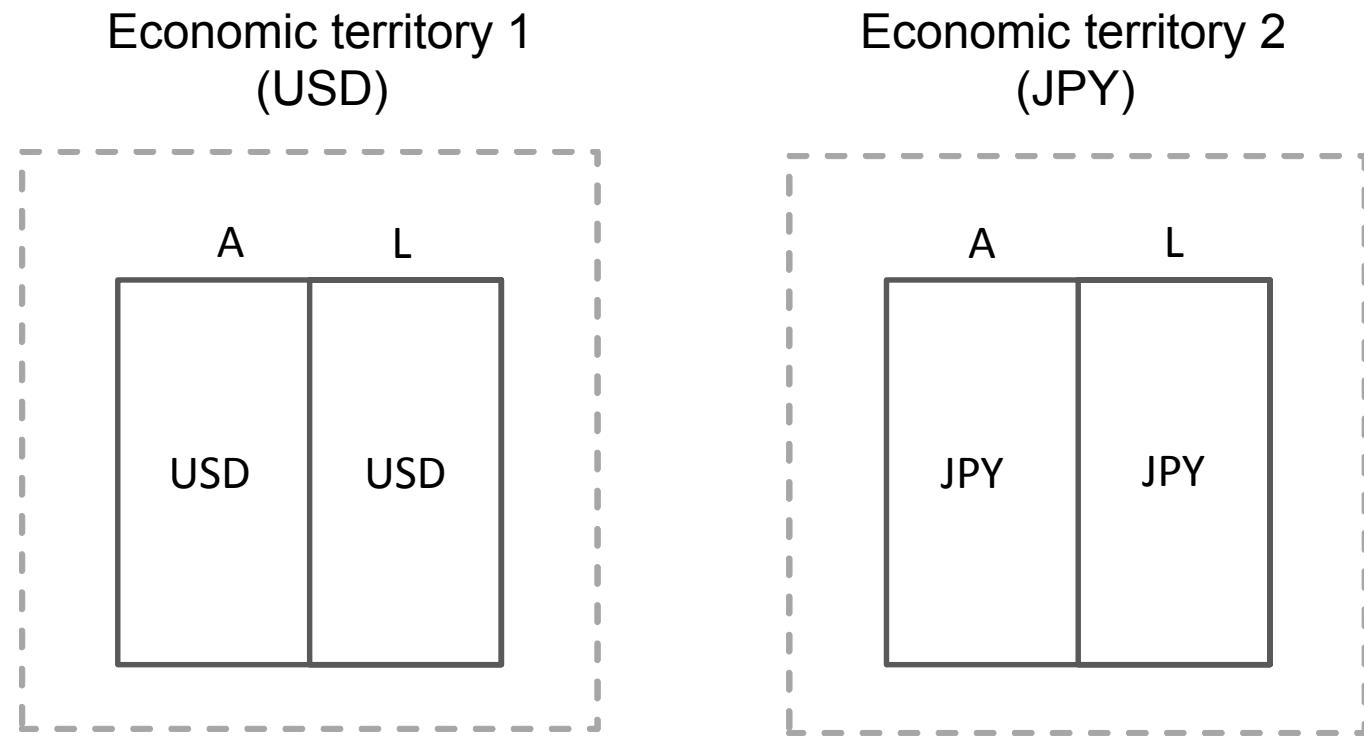
Figure 8. Boundary for national income accounting defines exchange rates as relative prices across boundary

Rethinking traditional boundaries

- Traditionally, international finance rests on "triple coincidence" of

  - GDP boundary, which defines "external" vs "internal"
  - Decision-making unit
  - Currency area

- In practice

  - decision-making unit can straddle GDP boundary
  - currency area $\neq$ GDP area

- Flows across currencies within a jurisdition may be just as important
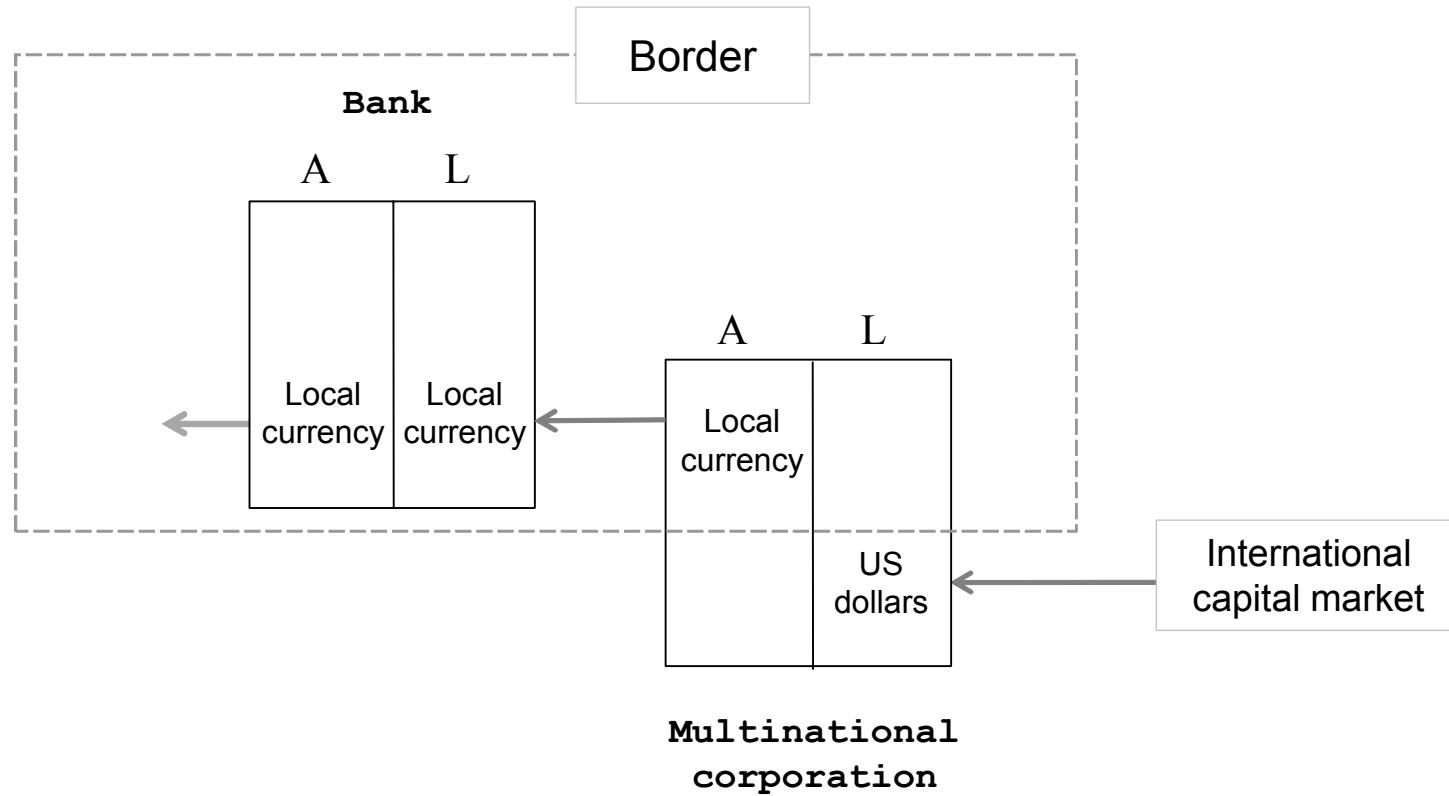
Figure 9. Offshore borrowing by multinational firm from emerging economy
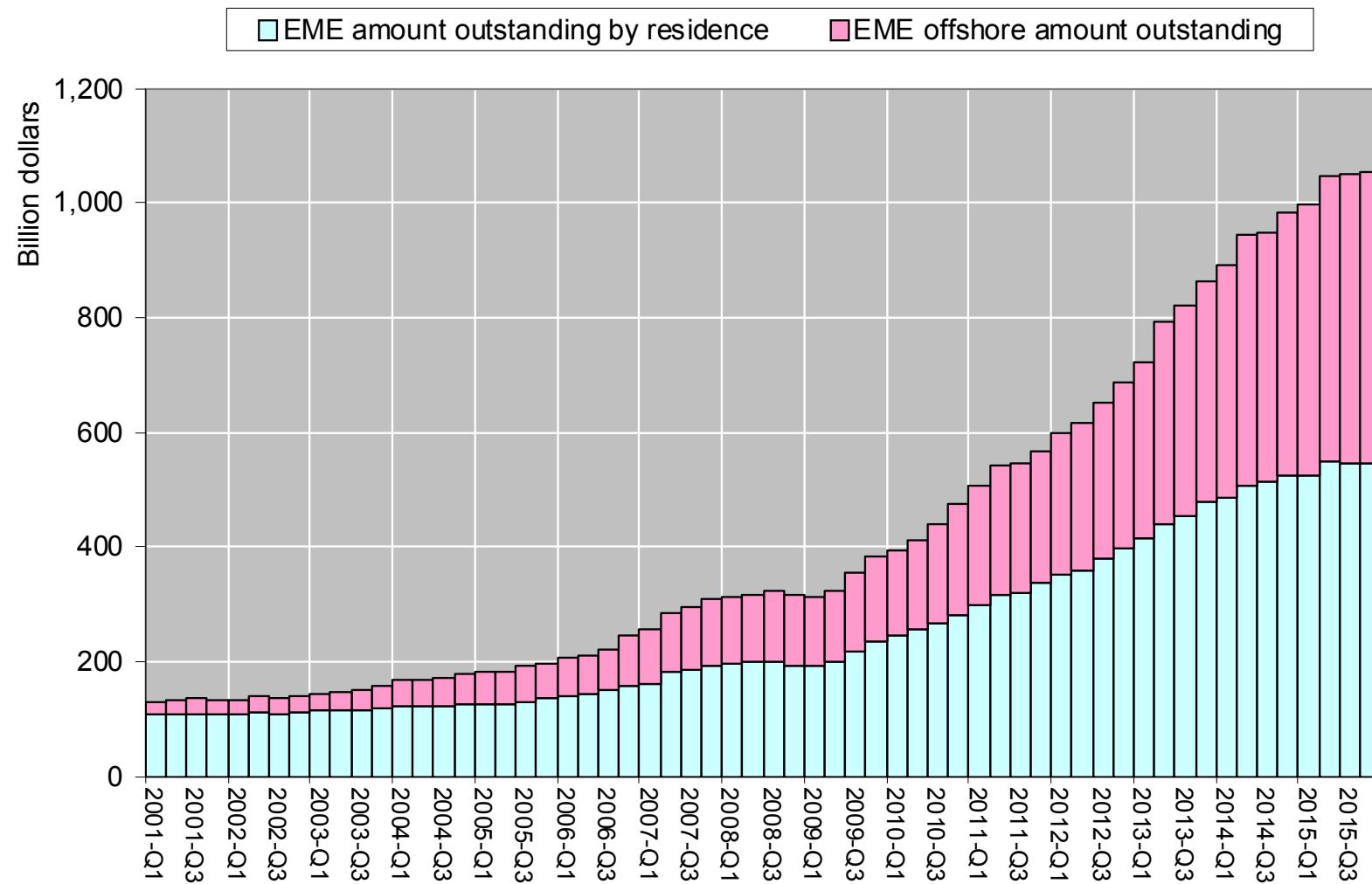
Figure 10. Outstanding amount of international debt securities of EME non-financial corporates, by nationality and by residence (Source: BIS international debt securities statistics)
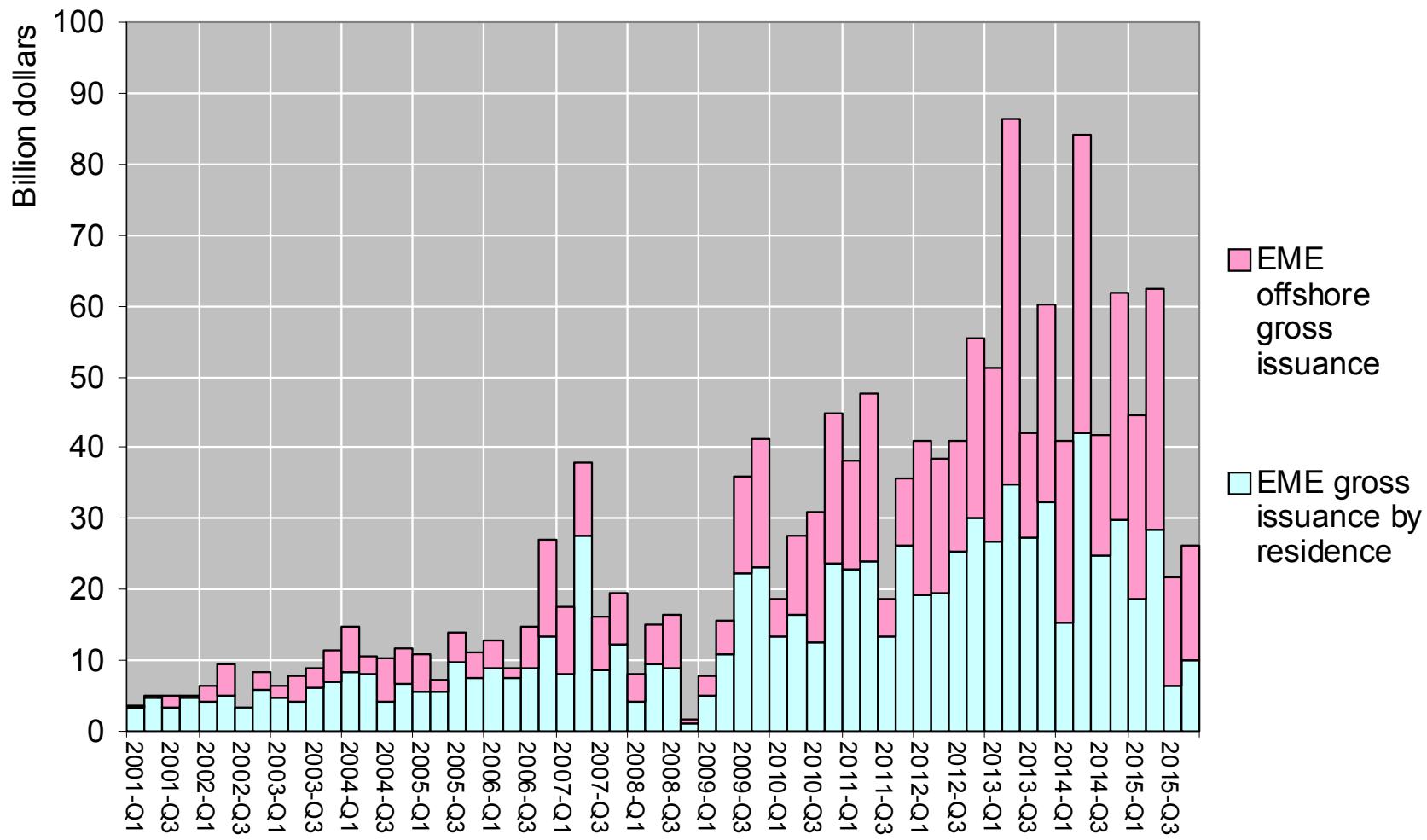
Figure 11. Gross issuance of international debt securities by EME non-financial corporates, by nationality and by residence (Source: BIS international debt securities statistics by nationality)
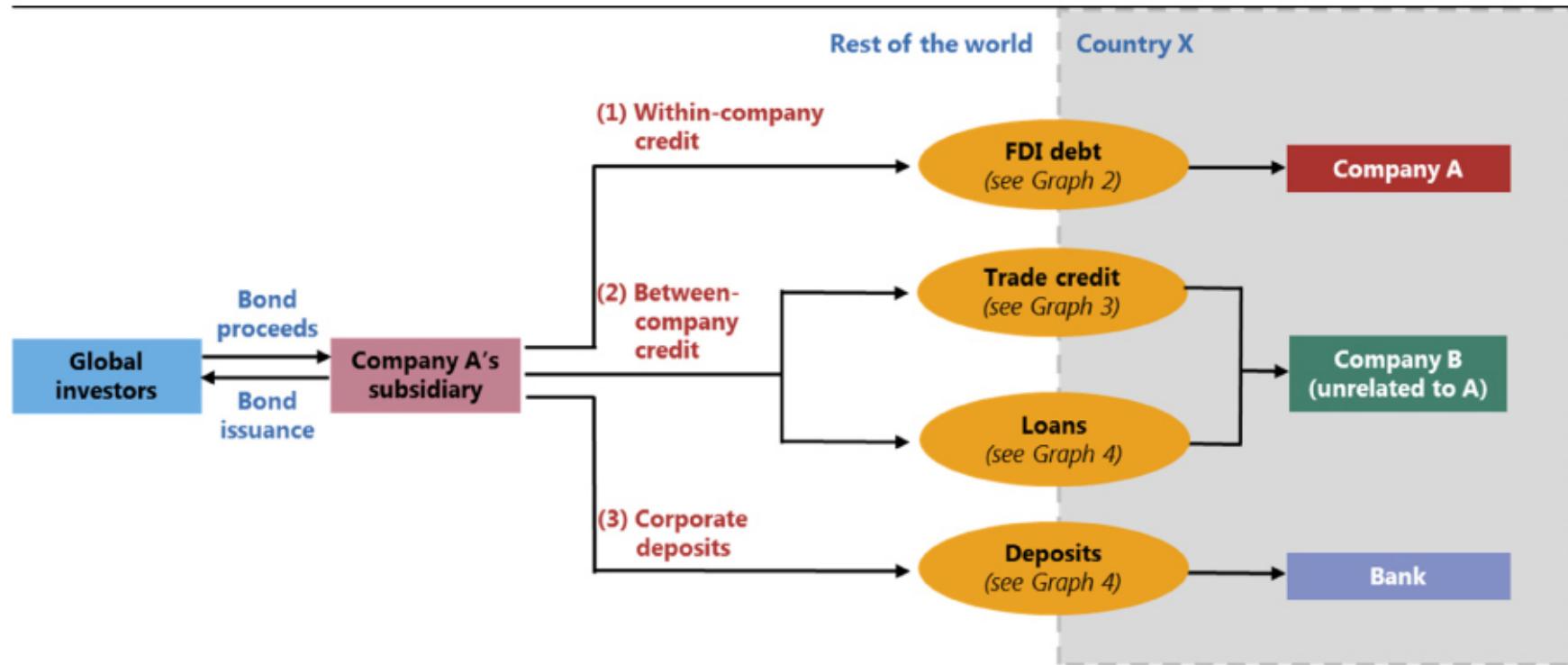
Figure 12. Capital flows through non-financial corporates (Source: Avdjiev, Chui and Shin, BIS Quarterly Review, December 2014)
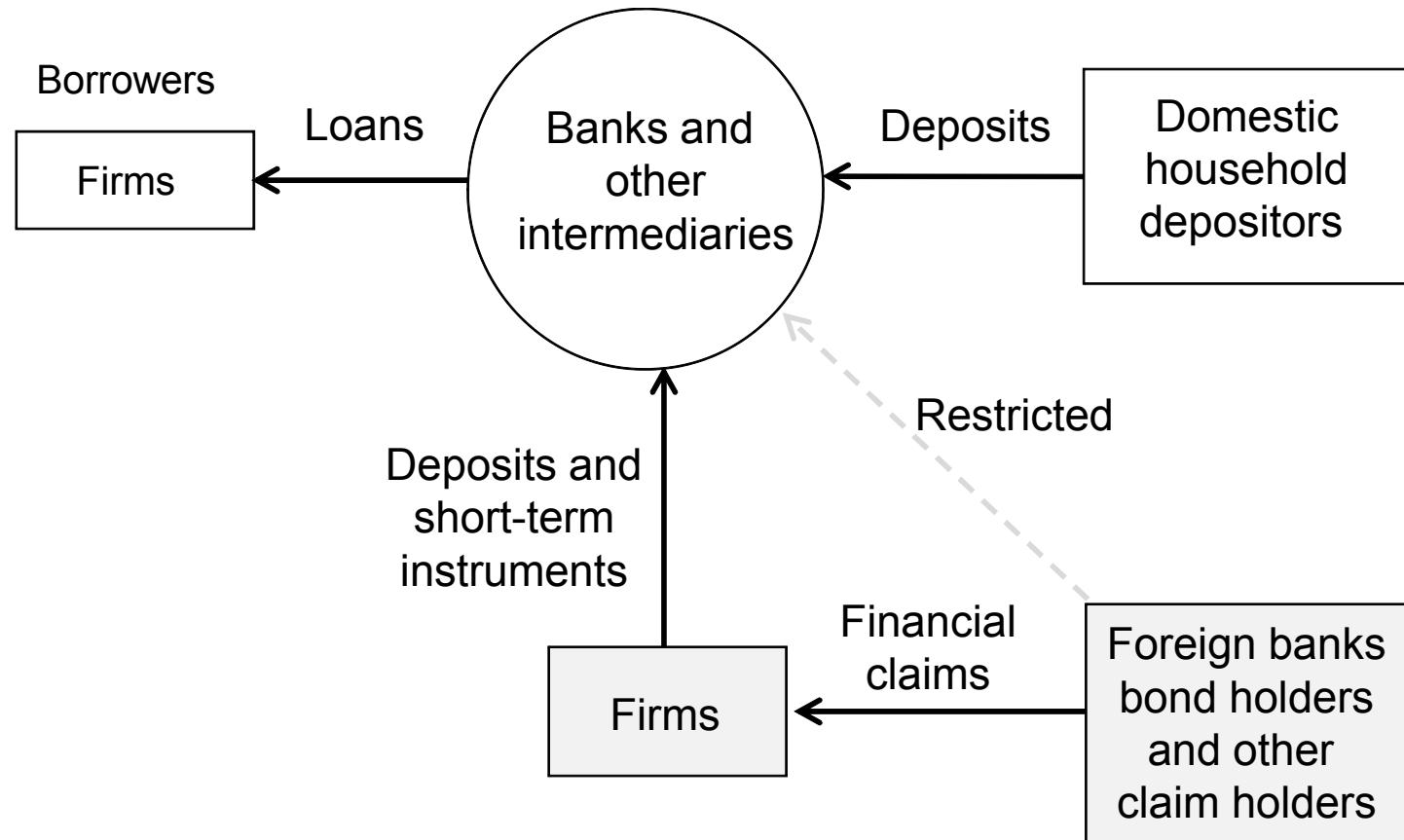
Figure 13. **Non-financial firms as intermediary.** In this diagram, firms with access to international capital markets act as an intermediary for outside funding when the banking sector has restricted access to international capital markets.
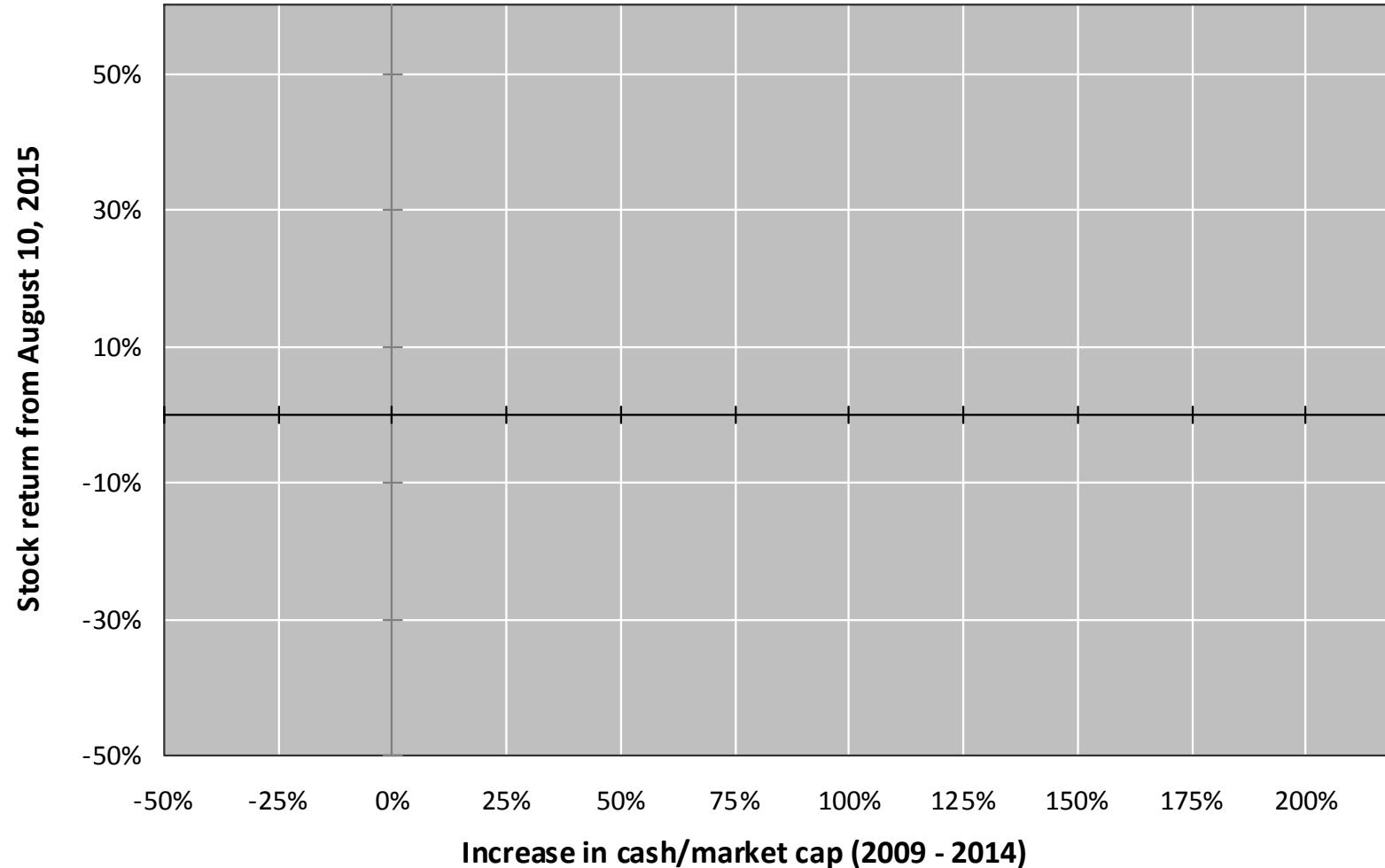
Figure 14. Stock returns from August 10, 2015 for a sample of firms in China with history of USD bond issuance (Source: Bruno and Shin (2016))
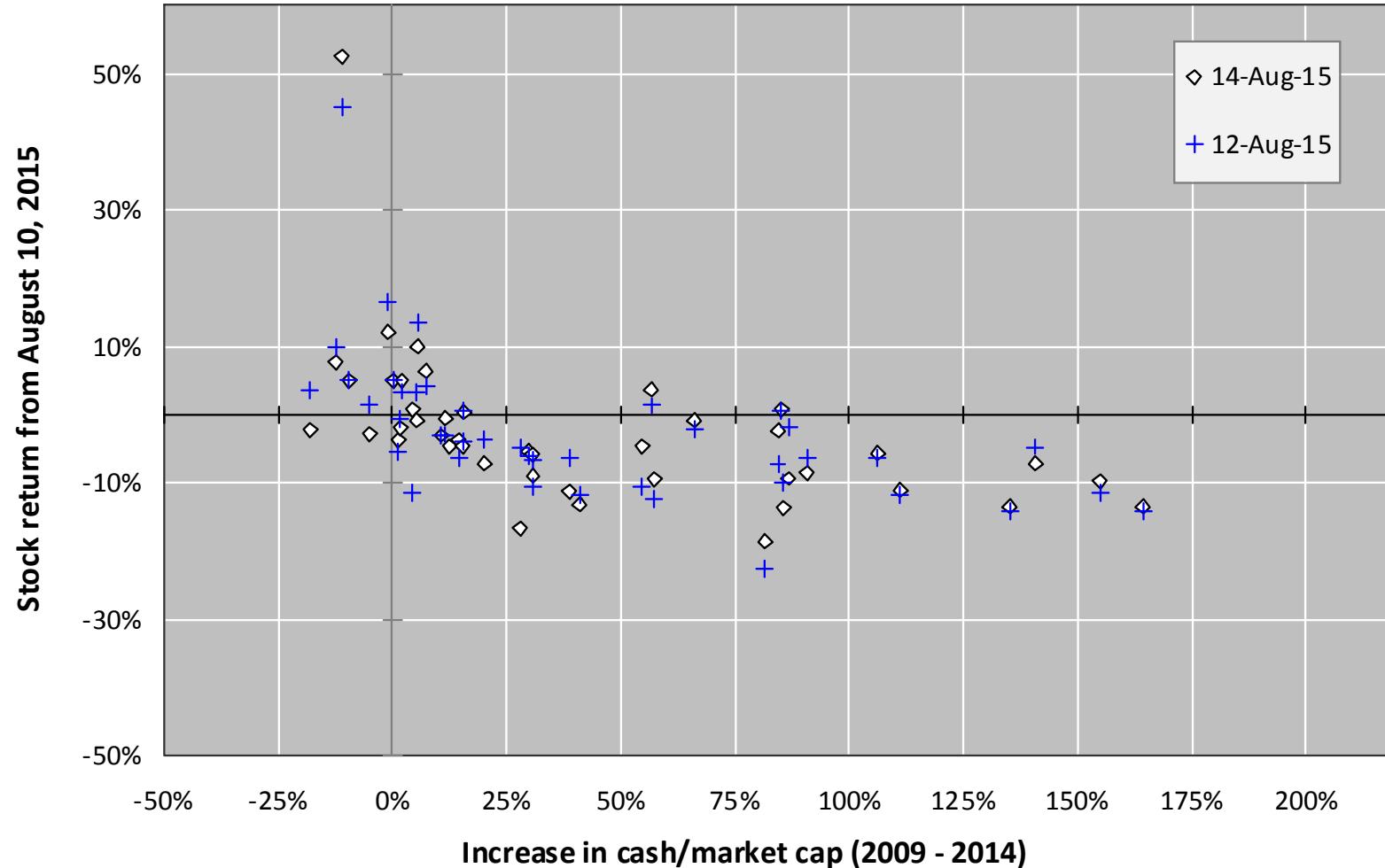
Figure 15. Stock returns from August 10, 2015 for a sample of firms in China with history of USD bond issuance (Source: Bruno and Shin (2016))

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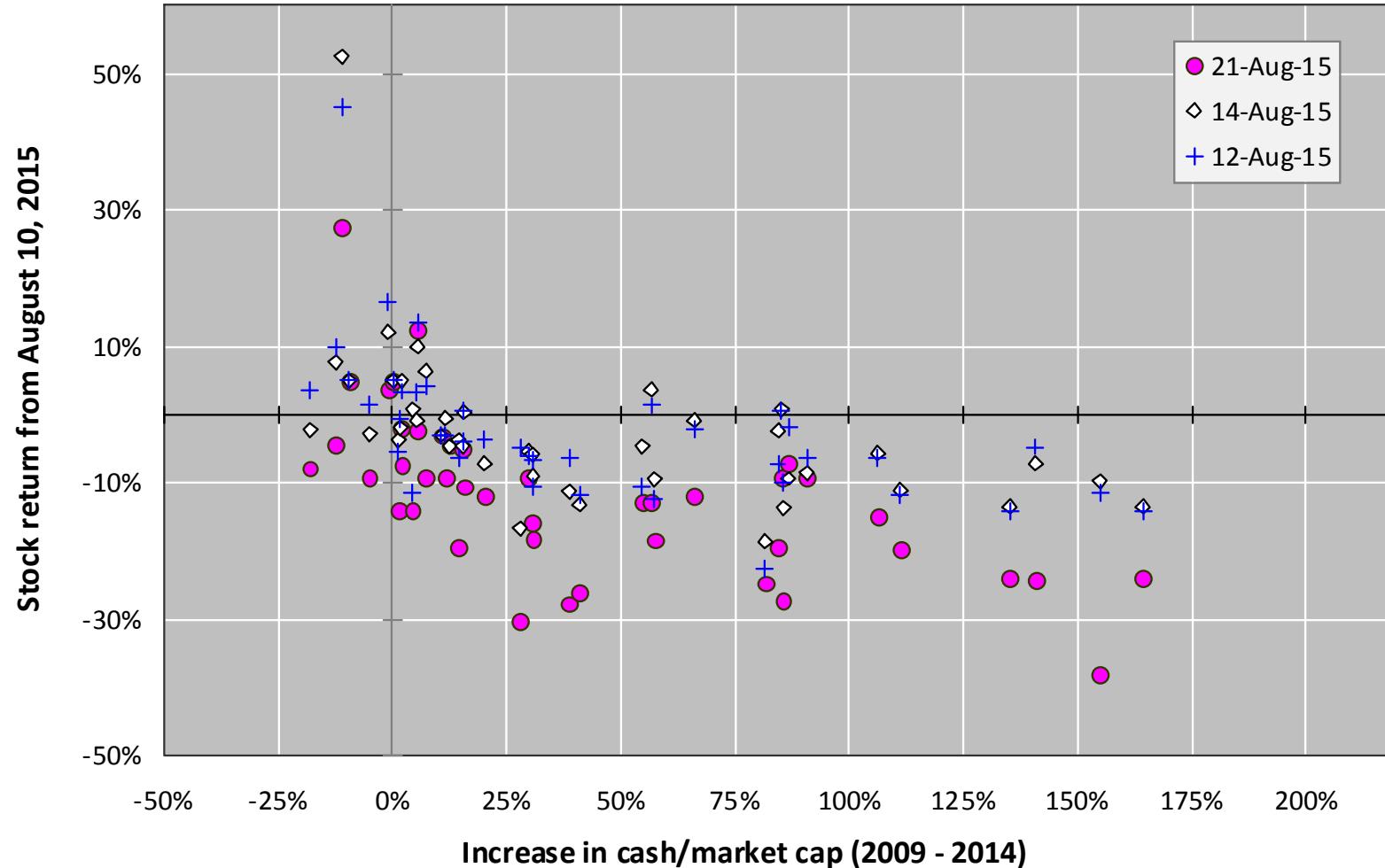
Figure 16. Stock returns from August 10, 2015 for a sample of firms in China with history of USD bond issuance (Source: Bruno and Shin (2016))

Firm-level investigation

Bruno and Shin (2015) "Global dollar credit and carry trades: a firm-level analysis"

Bruno and Shin (2016) "Currency depreciation and EME corporate distress"

- Issuance data from SDC Platinum (Thomson Reuters) Balance sheets from Worldscope

- Annual data, 2002 - 2014. consolidated to ultimate parent (like BIS nationality basis), except (a) firms with ultimate US parent (b) SIC 6 (financial) parent

- But include financial subsidiaries of non-financial firms; 35,750 firms, 1,750 bond-issuing firms, 11,713 issuance-year observations (19% US dollar-denominated)

Annual gross issuance and weighted average maturity of US dollar-denominated NFC bonds of non-US firms
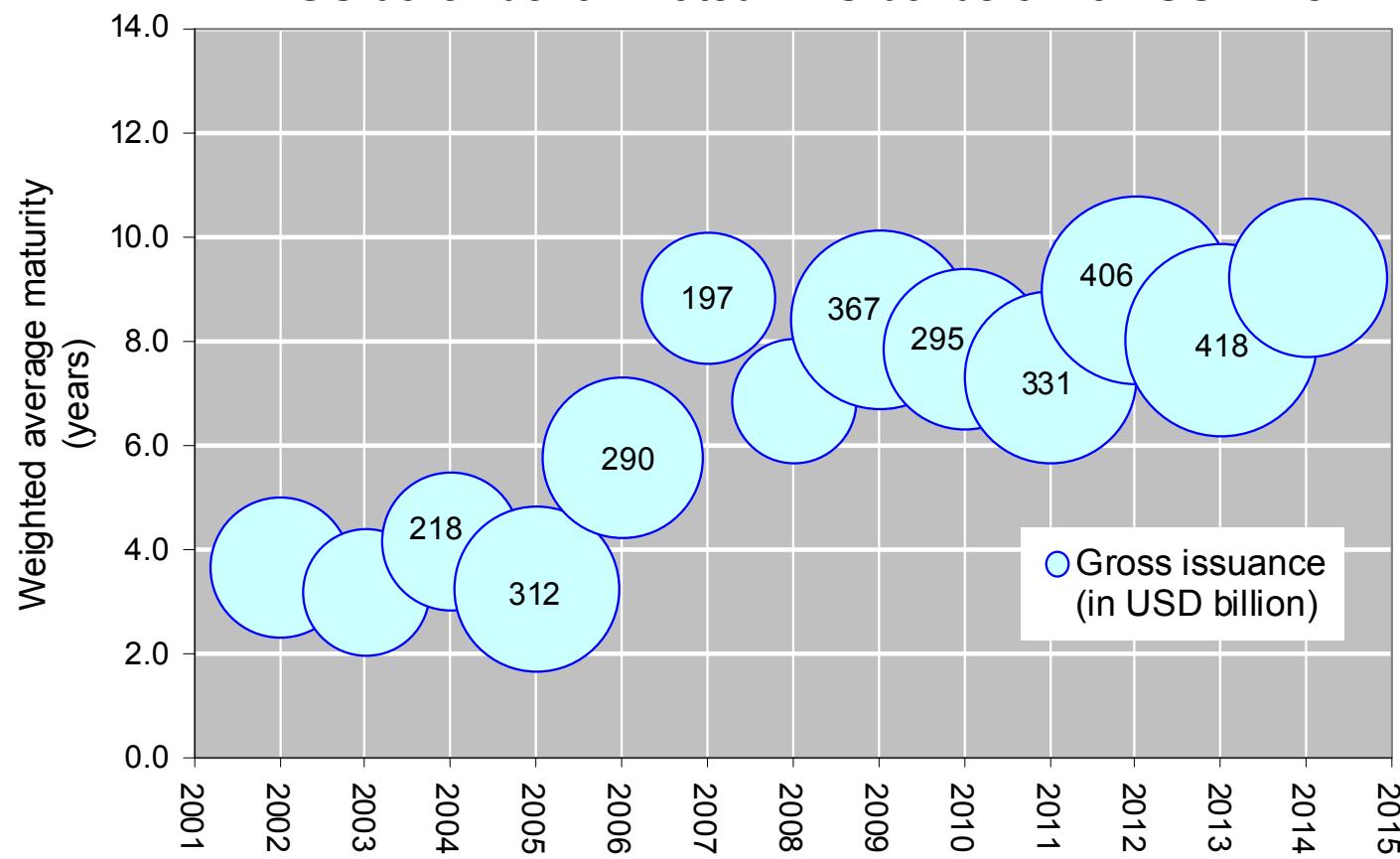
Figure 17. Annual gross issuance and weighted average maturity of US dollar-denominated non-financial corporate bonds of non-US headquartered firms

Annual gross issuance and weighted average maturity of US dollar-denominated emerging market NFC bonds
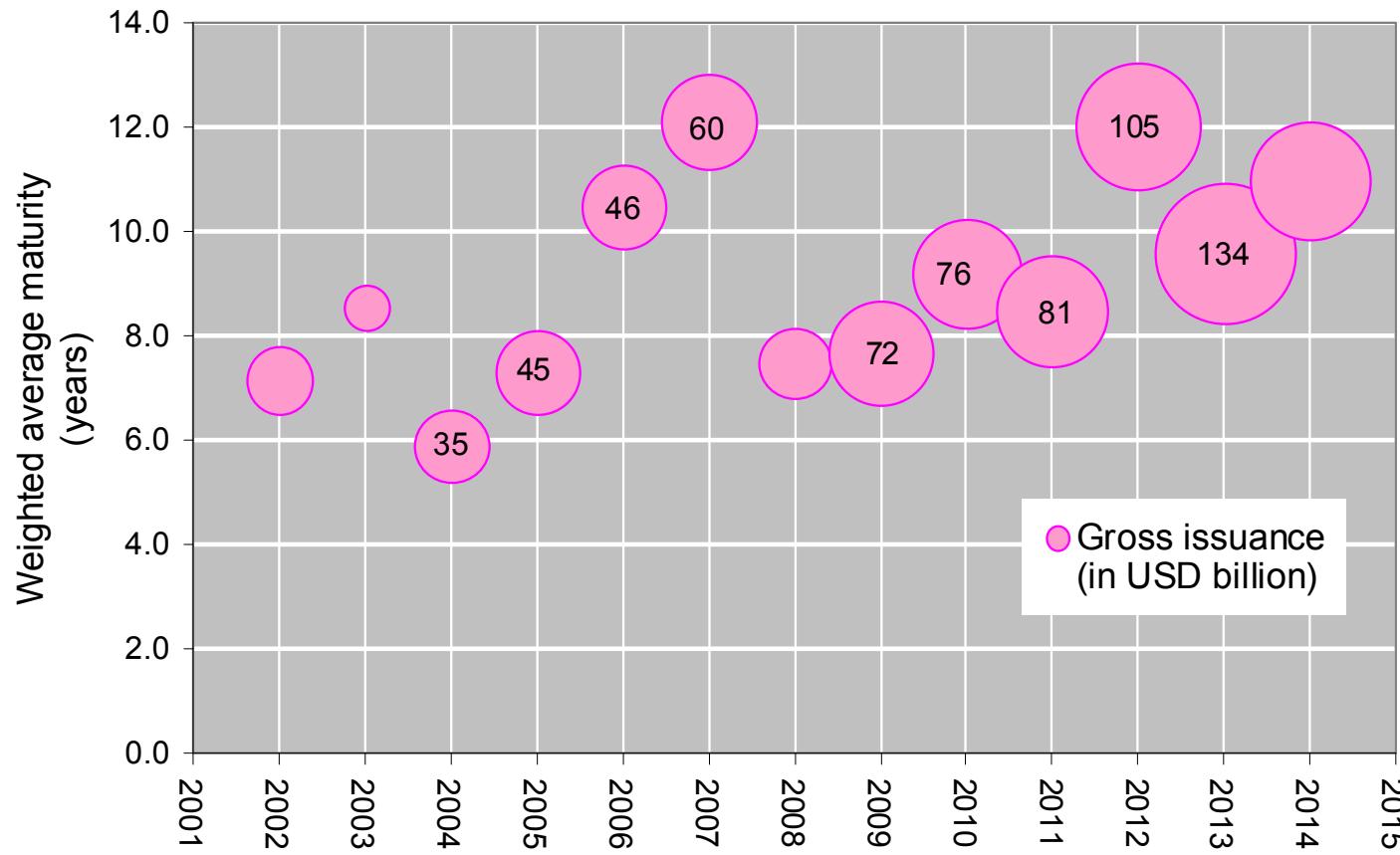
Figure 18. Annual gross issuance and weighted average maturity of US dollar-denominated emerging market non-financial corporate bonds

Determinants of US dollar bond issuance

Multinomial logit: dependent variables "issue USD bond" "issue non-USD bond" "no bond issue"						
	All		Emerging		Advanced	
	USD	non-USD	USD	non-USD	USD	non-USD
Cash	0.6944*	-1.2494**	1.5450***	-0.7212***	0.6086	-1.8192**
	[0.3892]	[0.5837]	[0.5292]	[0.2600]	[0.4950]	[0.7559]
ΔExchange Rate	-0.6160	-0.0835	-1.2529**	-1.8986*	0.5473	0.6448
	[0.5327]	[0.7639]	[0.5271]	[1.0934]	[0.6488]	[0.4416]
Size	0.4683***	0.4969***	0.3996**	0.3686***	0.5035***	0.5823***
	[0.0702]	[0.0420]	[0.1871]	[0.0254]	[0.0720]	[0.0456]
Leverage	0.2516	1.0973***	0.3317	0.9815***	-0.2307	1.2623***
	[0.2647]	[0.1330]	[0.6369]	[0.2048]	[0.2137]	[0.2499]
PPE	0.0024	-0.1075	-0.1565	-0.2378	0.1732	0.2977
	[0.2993]	[0.1102]	[0.3982]	[0.1823]	[0.4389]	[0.2322]
ROA	-0.3886	0.7723	0.9063	1.8875***	-1.1975	0.0864
	[0.7950]	[0.5715]	[1.3252]	[0.4343]	[0.8810]	[0.6871]
ΔGDP	0.0319*	0.0174	0.0244	-0.0614	0.0267	0.0426
	[0.0182]	[0.0215]	[0.0335]	[0.0395]	[0.0197]	[0.0377]
Inflation	0.0500**	0.0360	0.0185	-0.0238	0.0862*	0.1353
	[0.0209]	[0.0340]	[0.0232]	[0.0368]	[0.0479]	[0.0824]
Constant	-5.8683***	-7.2492***	-4.3996*	-6.1321***	-7.5326***	-6.3715***
	[1.0622]	[0.5986]	[2.3574]	[0.5461]	[0.7392]	[0.5331]
Observations	32,706	32,706	12,016	12,016	20,692	20,692
Country & Year F.E.	Y	Y	Y	Y	Y	Y
Industry F.E.	Y	Y	Y	Y	N	N
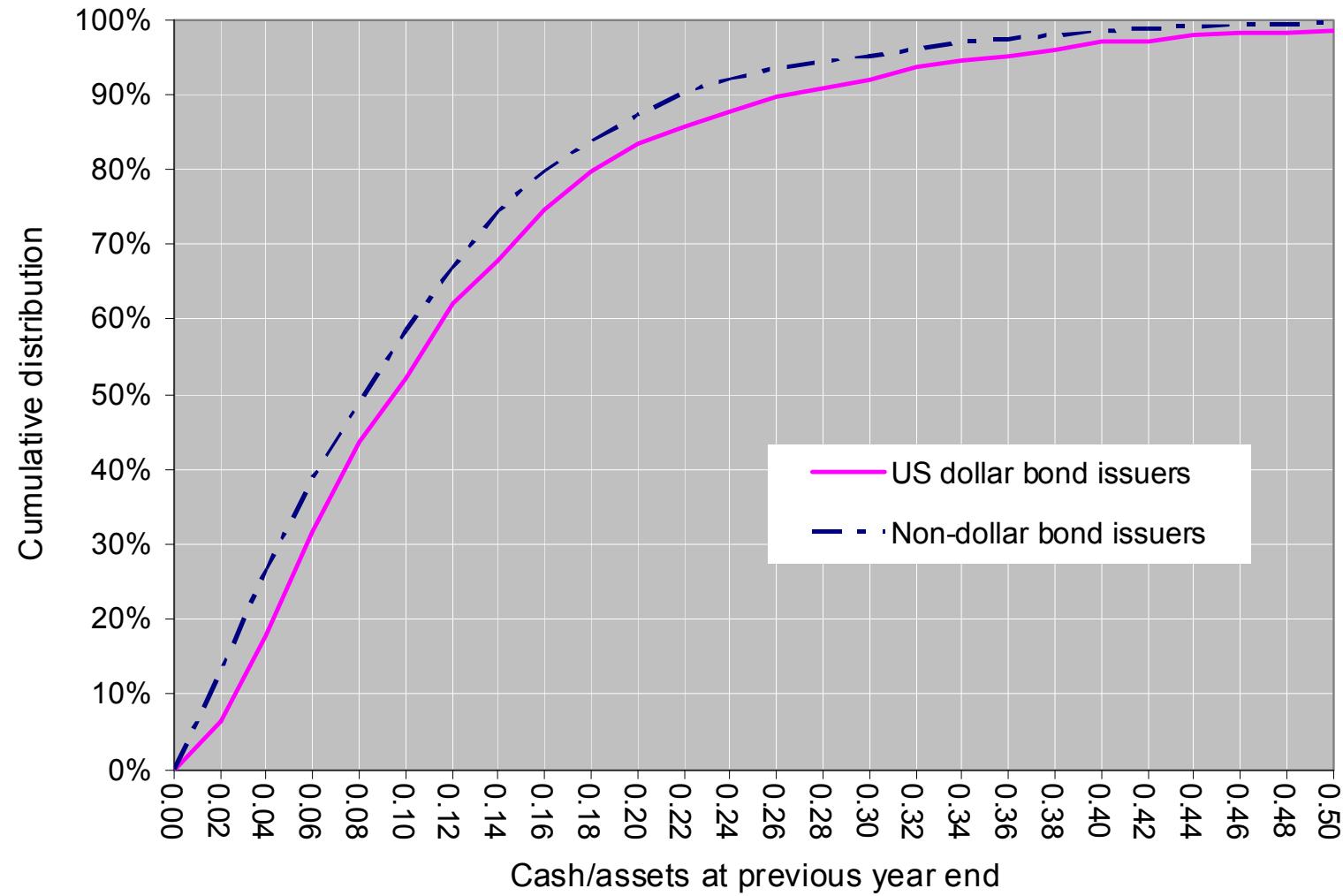
Figure 19. **Determinants of dollar bond issuance**. Cumulative distribution function of cash/assets at end of previous year conditional on currency denomination of bond issue

Tobit: dependent variable is USD issuance as proportion of total issuance

	All	All	All	Post 07	Pre 07	USD amount
Cash	1.8103***	1.6153**				
	[0.6771]	[0.6312]				
Cash*EME			2.9795***	3.0205***	3.2004**	7.0038***
			[0.5629]	[0.5185]	[1.4031]	[1.6420]
Cash*AE			1.2377	1.0841	1.0395	3.4226
			[0.8418]	[0.8929]	[1.4391]	[2.2410]
Size	0.1895**	0.1810**	0.1844**	0.1818**	0.1852	1.0602***
	[0.0819]	[0.0878]	[0.0834]	[0.0850]	[0.1183]	[0.2706]
Leverage	-0.5964	-0.4435	-0.6116	-0.5472	-0.7325	-1.0234
	[0.4761]	[0.3974]	[0.4744]	[0.5857]	[0.4694]	[1.2313]
PPE	-0.1887	-0.2881	-0.1721	-0.3426	0.3184	-0.6115
	[0.3571]	[0.3467]	[0.3565]	[0.3538]	[0.5192]	[0.9838]
ΔGDP	0.0580	0.0577*	0.0570	0.0668*	0.0554	0.1703**
	[0.0366]	[0.0338]	[0.0369]	[0.0356]	[0.1015]	[0.0840]
Inflation	0.0550	0.0688**	0.0549	-0.0173	0.0055	0.1037
	[0.0359]	[0.0320]	[0.0362]	[0.0457]	[0.0689]	[0.0839]
ΔExch Rate		0.5383				
		[0.6925]				
ROA		0.2016				
		[0.9805]				
Postcrisis		-0.2865				
		[0.2859]				
Constant	1.2631	1.2391	1.2507	0.9447	3.8758***	-1.6019
	[1.5534]	[1.4012]	[1.5692]	[1.7877]	[1.1284]	[4.2807]
Observations	9,243	8,762	9,243	6,886	2,357	9,243

	All	EME	AE	All	EME	AE
Tobit: dependent variable is USD issuance as proportion of total issuance						
Carry Trade	1.9561*	3.1376***	0.0516			
	[1.0934]	[1.2150]	[0.2640]			
Carry Return Index				2.9977**	3.7249**	0.2032
				[1.1997]	[1.8170]	[0.5016]
Cash	2.7119**	5.4014**	0.6901	2.4023**	6.9410***	0.6623
	[1.3079]	[2.1764]	[0.7050]	[1.1991]	[2.3564]	[0.7318]
Size	0.1280	0.6832***	0.1587**	0.1582*	0.4142	0.1548**
	[0.0924]	[0.1526]	[0.0782]	[0.0890]	[0.3297]	[0.0770]
Leverage	-1.3549***	-1.2121	-0.4360	-1.6710***	-3.8909	-0.4425
	[0.3725]	[0.9843]	[0.3139]	[0.5174]	[2.7271]	[0.3273]
PPE	-0.0598	-0.0131	-0.4532	-0.1145	-0.1056	-0.4396
	[0.7774]	[1.3546]	[0.3532]	[0.7286]	[1.1535]	[0.3581]
ΔGDP	-0.0936	-0.0464	0.0067	-0.0934	-0.1066	0.0095
	[0.0809]	[0.1052]	[0.0330]	[0.0659]	[0.1061]	[0.0332]
Inflation	0.0403	-0.1946**	0.0822	0.0271	-0.1299	0.0456
	[0.1081]	[0.0926]	[0.0598]	[0.1055]	[0.1363]	[0.0541]
Constant	-2.4021	-6.6013***	-2.3514**	-16.9427***	-23.1999**	-3.3111
	[1.4666]	[2.5124]	[1.0126]	[6.3608]	[9.7230]	[3.2460]
Observations	7,949	1,751	6,198	8,924	2,508	6,416

Tracking proceeds of US dollar bond issuance

For $t > 0$, define

Y_t is increase in cash over $\{1, \cdots, t\}$ as proportion of initial assets A_0
B_t is bond proceeds over $\{1, \cdots, t\}$
S_t is source of funds over $\{1, \cdots, t\}$ other than bond proceeds

Examine regressions:

$$
\begin{aligned}
Y_t \;=\; & \alpha + \beta_1 \ln\left(1 + B_t/A_0\right) + \beta_2 \ln\left(1 + B_t/A_0\right) * \mathsf{EME} \\
& + \beta_3 * \mathsf{EME} + \delta \ln\left(1 + S_t/A_0\right) + \mathsf{controls}
\end{aligned}
$$

		(1)	(2)	(3)	(4)	(5)	(6)
		t=1	t=2	t=3	t=1	t=2	t=3
		All	All	All	Post 2007	Post 2007	Post 2007
$\ln(1+B_t/A_0)$	β_1	0.1025***	0.0993***	0.1075***	0.1062***	0.0833***	0.0937**
		[0.0160]	[0.0230]	[0.0342]	[0.0207]	[0.0264]	[0.0414]
$\ln(1+B_t/A_0)*$EME	β_2	0.0262	0.0595*	0.0944*	-0.0004	0.0662*	0.1165*
		[0.0273]	[0.0323]	[0.0533]	[0.0259]	[0.0367]	[0.0588]
$\ln(1+S_t/A_0)$	δ	0.0184	0.0341***	0.0409***	0.0158	0.0335***	0.0357***
		[0.0118]	[0.0111]	[0.0122]	[0.0126]	[0.0122]	[0.0130]
EME		0.0017	-0.0632***	-0.0987***	-0.0202***	-0.0032	-0.0681***
		[0.0048]	[0.0055]	[0.0113]	[0.0048]	[0.0058]	[0.0151]
$\ln(A_0)$		0.0009	-0.0017	-0.0046**	0.0011*	-0.0022*	-0.0050**
		[0.0006]	[0.0011]	[0.0017]	[0.0006]	[0.0013]	[0.0020]
Constant		0.0454*	0.0817*	0.1165**	0.0389	0.0126	0.0669**
		[0.0250]	[0.0410]	[0.0466]	[0.0265]	[0.0206]	[0.0272]
# countries		47	47	47	47	47	47
Observations		7,109	6,059	4,709	7,109	6,059	4,709
R-squared		0.082	0.118	0.159	0.083	0.120	0.163
p-value							
$\beta_1 = \delta$		0.000	0.018	0.070	0.000	0.095	0.202
$\beta_1 + \beta_2 = \delta$		0.000	0.000	0.000	0.000	0.000	0.090

Dependent variable: stock return June 2014 - January 2016					
Depreciation			-0.0159	0.5749***	
			[0.877]	[0.000]	
Cash*Depreciation	-0.0840***	-0.1097*	-0.0961**	0.0100	0.0007
	[0.010]	[0.071]	[0.044]	[0.828]	[0.987]
Constant	-0.0115***	-0.0111***	0.0014	-0.0332***	-0.0164***
	[0.000]	[0.000]	[0.828]	[0.000]	[0.000]
Observations	19,106	11,365	19,106	29,133	29,133
R-squared	0.313	0.376	0.220	0.142	0.217
Number of firms	1,013	1,008	1,013	1,482	1,482
Sample	EME	EME	EME	AE	AE
Firm FE	Y	Y	Y	Y	Y
Country-month FE	Y	Y	N	N	Y
Industry-month FE	N	N	Y	N	N

Dependent variable: stock return June 2014 - January 2016				
Country X equal to		China	Russia	India
Depreciation*Cash*Non-USD Bond	-0.0524			
	[0.492]			
Depreciation*Cash*USD Bond	-0.2358**			
	[0.046]			
Depreciation*Cash*Other Countries		-0.2600*	-0.2461	-0.3258**
		[0.069]	[0.400]	[0.021]
Depreciation*Cash*Country X		-0.8939***	-0.3893***	-0.8274***
		[0.000]	[0.000]	[0.000]
Constant	-0.0282***	-0.0279***	-0.0286***	-0.0286***
	[0.000]	[0.000]	[0.000]	[0.000]
Observations	15,123	3,028	3,028	3,028
R-squared	0.325	0.288	0.287	0.287
Number of firms	796	159	159	159
Firm FE	Y	Y	Y	Y
Country-month FE	Y	Y	Y	Y
Sample	All Issuers	USD only	USD only	USD only

Summary of findings

- EME non-financial firms

  - issue USD bonds when they already have large cash balances
  - contrary to "pecking order" theory
  - not explained by precautionary motives
  - more USD issuance when Sharpe ratio of carry trade is high

- Proceeds of USD bond issuance followed by increase in holding of cash and short-term securities

Impact on Emerging Economies

- EME local currency bond yields

  - Fiscal consequences of oil price
  - Spillover to local currency sovereign yields

- EME corporate bond issuance activity, especially offshore issuance

  - Spillover of financial conditions due to surrogate intermediary activity

- Transmission channel is reinforced by exchange rate changes

Unfamiliar Problems

- Asset managers (not banks) are at the heart of transmission mechanism

- Textbooks say long-term investors are benign, not a force for destabilization

- How do we adjust to the new world?
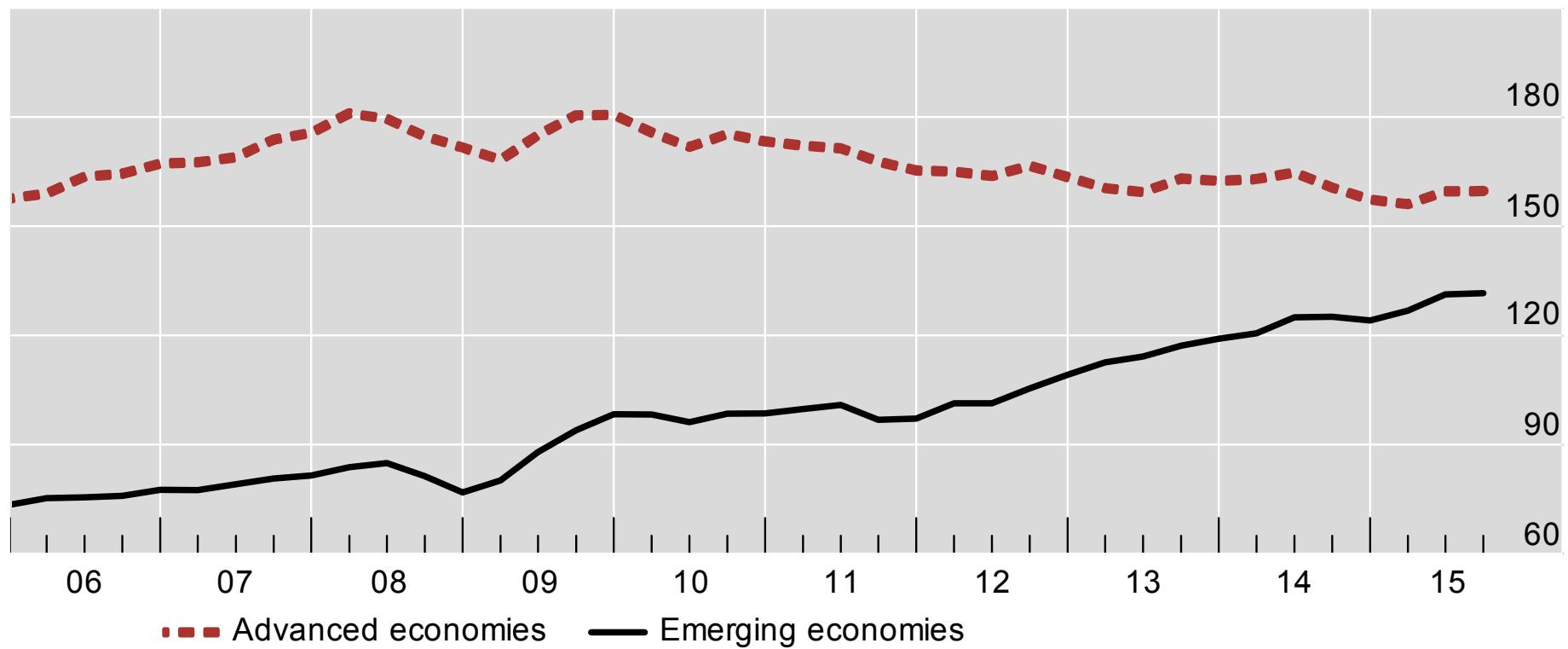
Figure 20. Non-financial private sector debt as proportion of nominal GDP (Source: Caruana (2016), BIS debt statistics)
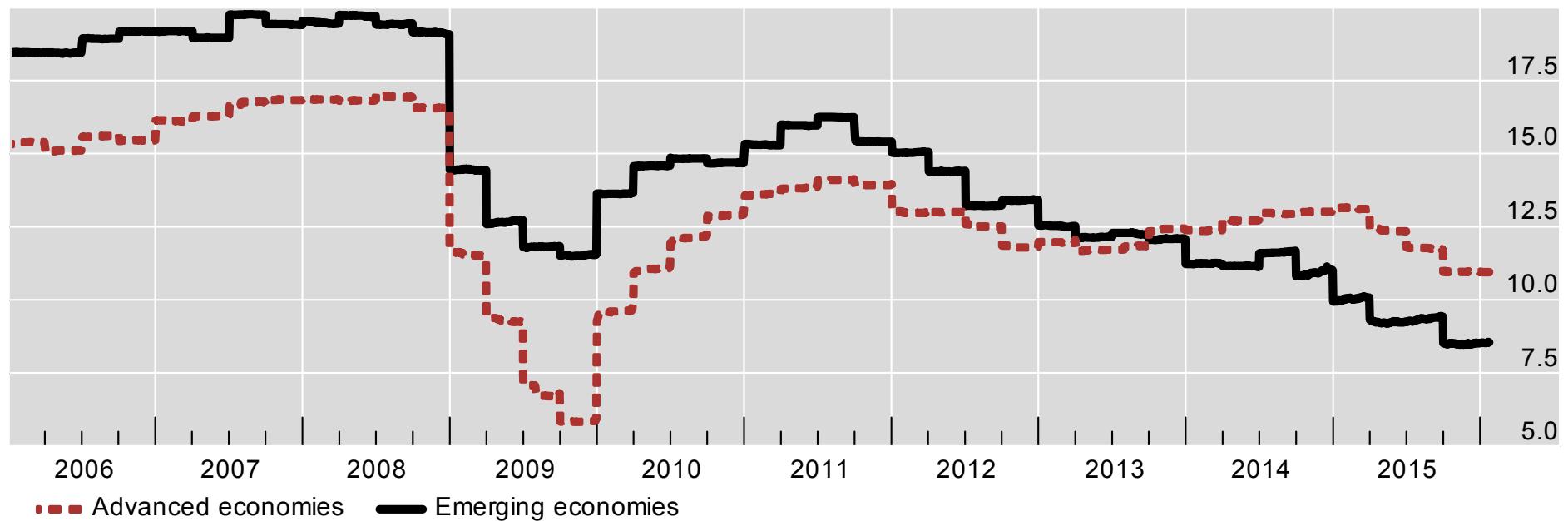
Figure 21. Return on equity of non-financial corporates in advanced and EMEs (Source: Caruana (2016), S&P Capital IQ)