International Financial Spillovers to Emerging Market Economies: How Important Are Economic Fundamentals?*

Shaghil Ahmed (Federal Reserve Board)
Brahima Coulibaly (Federal Reserve Board)
Andrei Zlate (Federal Reserve Bank of Boston)

14th Research Meeting of NIPFP-DEA Research Program
Alwar, Rajasthan, December 11-12, 2015

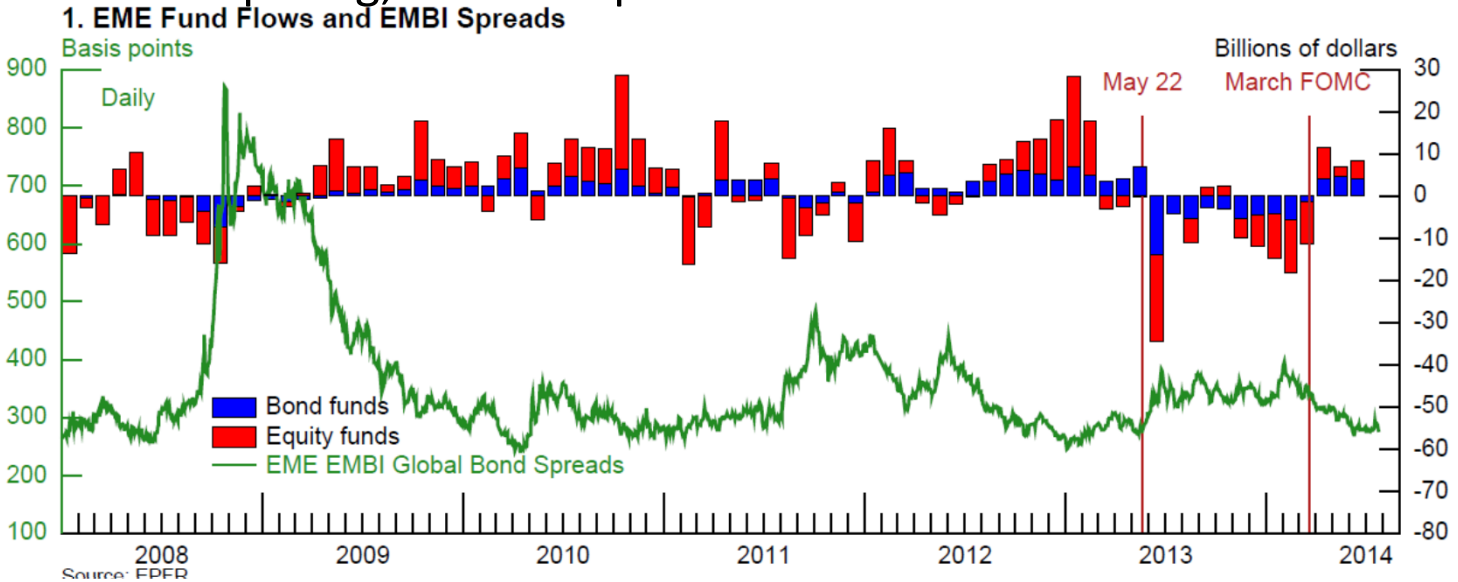
*The views in this presentation are the responsibility of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System, the Federal Reserve Bank of Boston, or any other person associated with the Federal Reserve System.

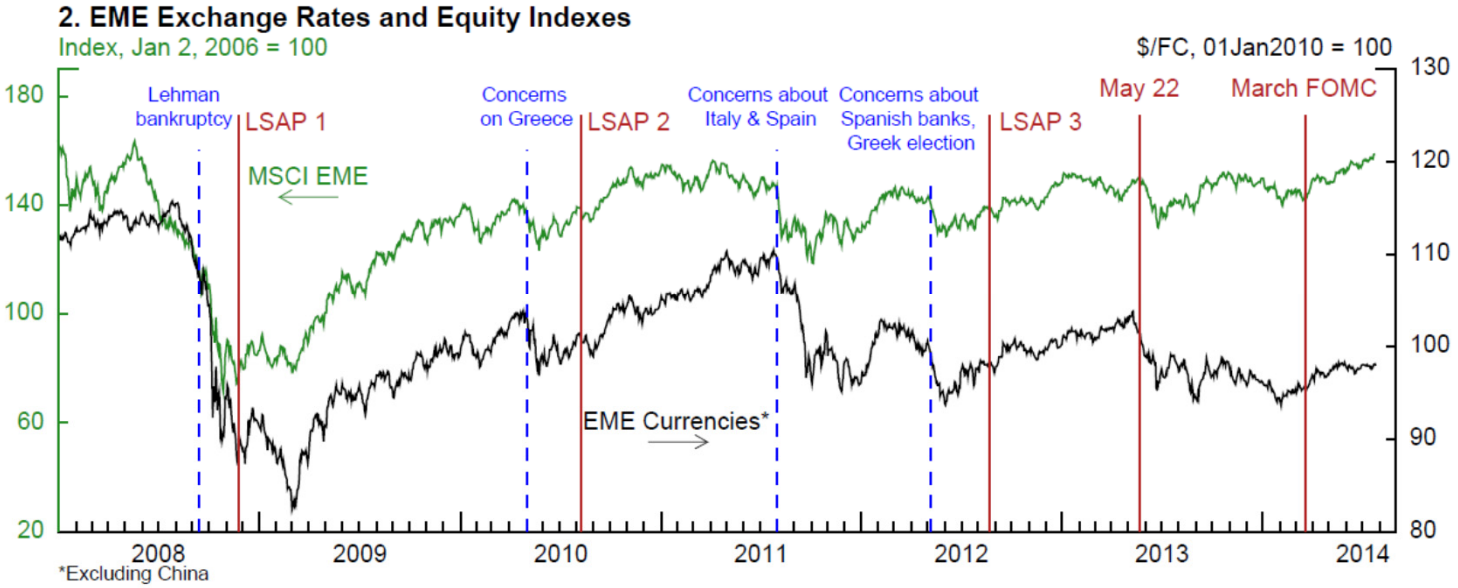
Outline

1. Questions and preview of results
2. Literature
3. Econometric specification and data
4. Question 1: differentiation during “taper tantrum” in 2013?
5. Question 2: timing and persistence of differentiation in 2013?
6. Question 3: differentiation during past stress episodes?
7. Conclusion

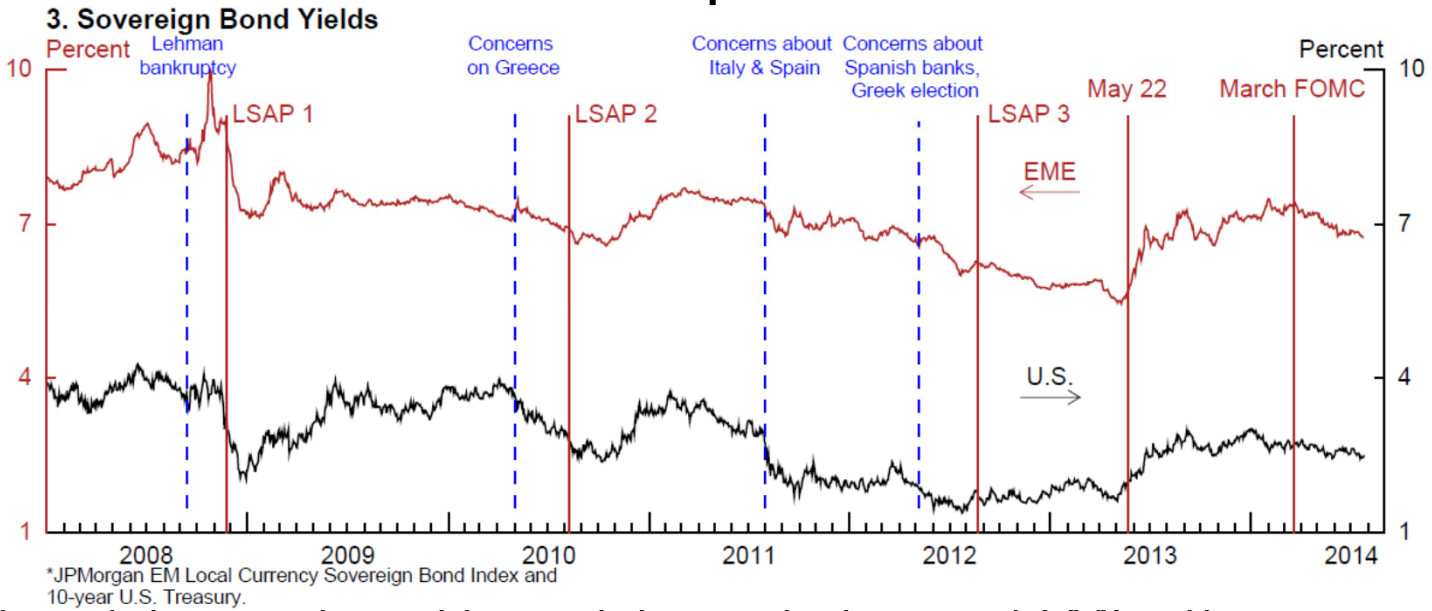
1. Questions and preview of results

- In May 2013, as market participants changed their expectations about the path of LSAP tapering, investors pulled out of EME assets:

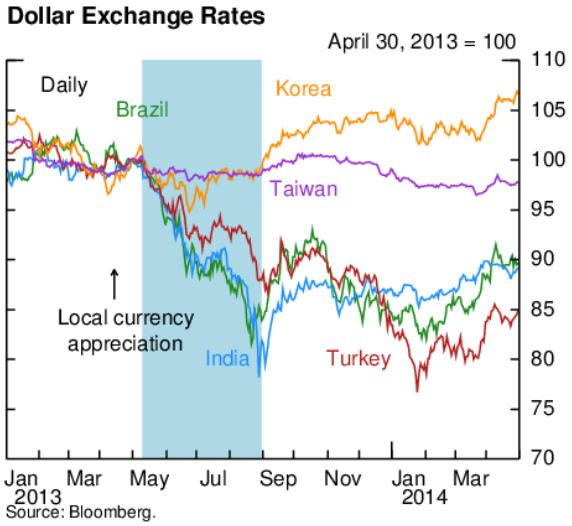


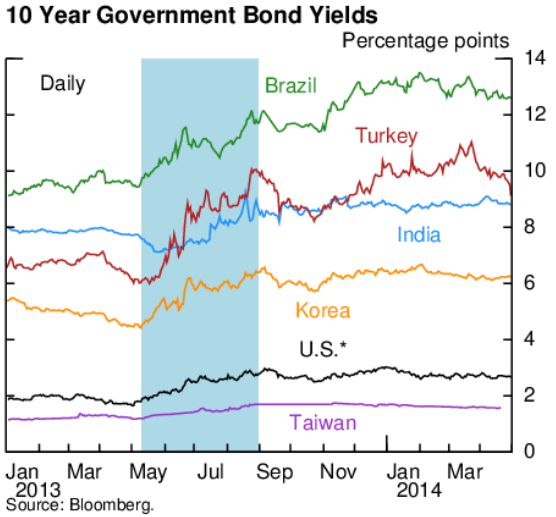


1. Questions and preview of results



- Although financial conditions deteriorated in most EMEs, there was wide dispersion in financial performance across EMEs:





1. Questions and preview of results

- **Questions:**
  1. What explains the heterogeneous response of EME financial markets during the taper tantrum in 2013?
     - The strength of macroeconomic fundamentals?
     - The magnitude of earlier capital inflows? ("more-in-more-out")
     - Structure of financial markets?
  2. What were the timing and persistence of differentiation in 2013?
  3. Did differentiation also occur during past stress episodes, or was it unique to 2013?

1. Questions and preview of results

- **Sneak preview of findings:**
  1. EMEs with better fundamentals suffered less deterioration in financial markets.
     - Controlling for fundamentals, "more-in-more-out" and market structure mattered some.
     - However, fundamentals mattered most.
  2. Differentiation among EMEs set in early in the 2013 episode and persisted throughout the episode.
  3. Differentiation based on fundamentals not unique to 2013.
     - No evidence for crises during the 1990s and the early 2000s.
     - However, we see differentiation during the GFC (2008), then increasingly during the European sovereign crisis (2011) and 2013.

2. Literature

- Eichengreen and Gupta (2013)
  - Fundamentals played no role (fisc. bal., public debt, FX reserves, growth outlook);
  - However, EMEs with (1) larger ex-ante increases in CA deficits and REER appreciation and/or (2) larger and more liquid financial markets fared worse.
- Aizenman et al (2014)
  - EMEs with better fundamentals fared worse (CA, FX reserves, external debt/GDP); in the very-short term after taper news shock.
- Mishra et al. (2014), Bowman et al. (2014):
  - EMEs with better fundamentals fared better (CA, fisc. bal., gr. outlook, inflation).
  - Macroprudential policies in place were associated with less stress (Mishra et al.)
- Our results on fundamentals as mitigating factors contrast with Eichengreen and Gupta (2013) and Aizenman et al. (2014), but are consistent with Mishra (2014) and Bowman et al. (2014):
  - Document importance of fundamentals as mitigating factors.
  - While controlling for fundamentals, more-in-more-out and market structure also played a role.

2. Literature (continued)

- What explains the diverge of results?
  - The definition of fundamentals.

    Current account levels or changes?
  - The measurement of fundamentals.

    Continuous, rankings, “robust” vs. “fragile” countries.

    External debt normalized by GDP or by FX reserves?
  - Dating the stress episode, identifying shocks.

    Peak-to-trough, 24h intervals around shocks, etc.
  - Sample size.
  - Testing multiple hypotheses simultaneously.

3. Econometric specification and data

- ***Cross-sectional regressions*** of financial performance on EME fundamentals:

$$\Delta FinVar_{i\,(start-end)} = \alpha + \beta_1{}'MF_i + \beta_2{}'MIMO_i + \beta_3{}'MS_i + \varepsilon_i$$

- ***Dependent variable*** computed for start-to-end period (Apr-Aug 2013):
  - Currency depreciation against the US dollar (%)
  - Depreciation pressure index*
  - Increase in local currency bond yields (ppt)
  - Change in stock market index (%)
  - Change in EMBI spreads and CDS spreads (ppt)

- ****Depreciation Pressure Index***:
  - Higher values show depreciation pressure (Eichengreen et al., 1995)
  - Takes into account the heterogeneous XR policy responses across EMEs and the shifting XR regimes over time:

$$DPI_{i\,(start-end)} = \frac{\%\Delta Ex.Rates}{\sigma_{\%\Delta ER}} - \frac{\%\Delta FX\ Reserves}{\sigma_{\%\Delta FX}}$$

3. Econometric specification and data

- ***Explanatory variables*** measured as of 2012:
  - Macro fundamentals (*MF*), including vulnerability index**, growth prospects, policy regimes.
  - More-in-more-out (*MIMO*): capital inflows, REER apprec. over 2010-12.
  - Market structure (*MS*): market cap, foreign participation, KA openness.

- ***Vulnerability index** relative within the sample EMEs:
  - Based on six macro indicators:

    (1) Current account/GDP

    (2) Short-term ext. debt/FX reserves

    (3) Foreign exchange reserves/GDP

    (4) Gross government debt/GDP

    (5) Inflation over past three years

    (6) Δ(Bank credit/GDP) over past five years

  - Rank EMEs according to each macro indicator, with the more vulnerable ranked higher.
  - For each EME, take the average rankings across six indicators; higher values show greater relative vulnerability.

3. Econometric specification and data

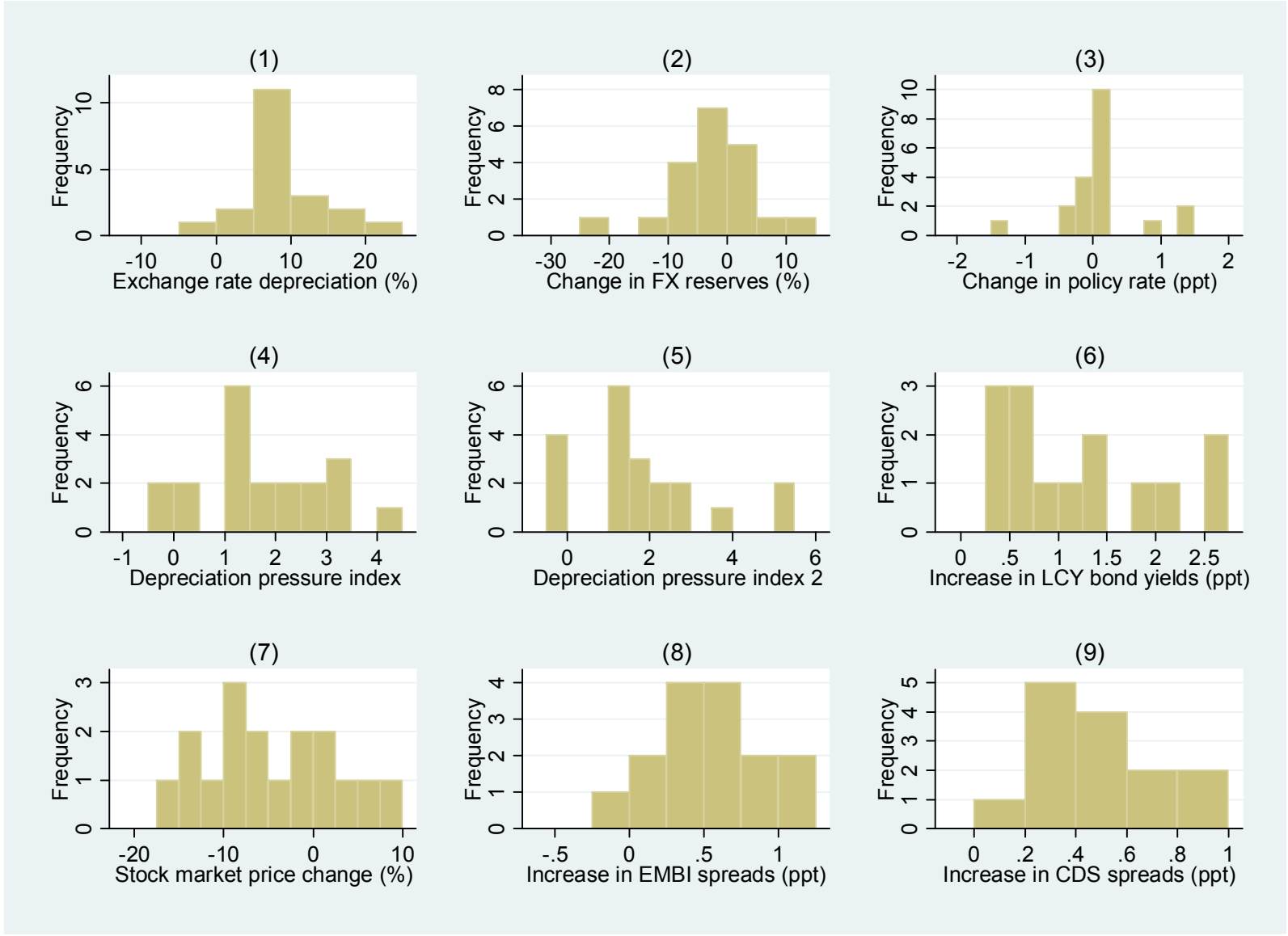
- ***Sample of 20 EMEs:***
  - Argentina, Brazil, China, Chile, Colombia, Indonesia, India, Korea, Malaysia, Mexico, Peru, Paraguay, the Philippines, Pakistan, Russia, South Africa, Taiwan, Thailand, Turkey, Uruguay.
  - Exclude hard peg regimes, dollarized, and Eastern European EMEs.

3. Econometric specification and data: Apr-Aug 2013

Variable:	Obs	Mean	Median	St.Dev.	Min	Max	Source
Dependent variables:							
Exchange rate depreciation (%)	20	9.4	8.7	6.2	-0.8	22.8	IMF's IFS database
Depreciation pressure index	20	1.8	1.6	1.2	-0.2	4.2	Authors' calculations
Depreciation pressure index 2	20	1.8	1.5	1.6	-0.3	5.5	Authors' calculations
Change in local currency bond yields (ppt)	14	1.2	1.9	0.8	0.3	2.7	Bloomberg
Change in stock market index (%)	17	-4.6	-5.1	7.3	-15.0	9.7	Bloomberg
Change in EMBI spreads (ppt)	15	0.5	0.5	0.3	-0.1	1.1	JP Morgan's EMBI Global database
Change in CDS spreads (ppt)	14	0.5	0.4	0.3	0.0	1.0	Markit
Memo:							
Change in reserves (%)	20	-3.1	-2.6	7.3	-25.0	12.5	IMF's IFS database
Change in policy rates (ppt)	20	0.0	0.0	0.6	-1.4	1.5	Bloomberg, Haver
Macro fundamentals and policy variables:							
Current account/GDP 2012	20	-0.6	-1.7	4.4	-6.2	10.7	IMF's WEO database
Reserves/GDP 2012	20	24.8	17.4	18.7	4.5	84.8	Haver, IMF's IFS database
Short-term ext. debt/reserves 2012	20	37.5	35.4	19.6	12.1	87.5	Joint External Hub Database (BIS-IMF-OECD-WB)
Gov debt/GDP 2012	20	39.3	40.7	17.8	12.0	68.2	IMF's Historical Debt and WEO databases
Inflation, annual, 2010-12 average	20	5.3	4.4	2.9	1.4	11.8	Haver
Bank credit/GDP 5-year change, 2012	20	9.7	7.6	11.3	-11.7	26.2	IMF's IFS database
Vulnerability index 2012	20	23.0	23.5	6.7	11.8	36.0	Authors' calculations
Growth forecast 2013 revision, Consensus	20	0.1	-0.1	0.6	-0.6	2.2	Consensus growth forecast
Dummy, inflation targeter	19	0.6	1.0	0.5	0.0	1.0	IMF's Exchange Rate Classification
Dummy, XR floater	19	0.1	0.0	0.3	0.0	1.0	IMF's Exchange Rate Classification
More-in-more-out variables:							
Gross inflows/GDP, cumul. 2010-12	19	3.4	2.4	2.9	-0.3	8.5	Haver
REER appreciation, average 2009-12	20	2.8	2.5	2.7	-2.0	8.3	Federal Reserve Board
Financial market structure:							
Market cap/GDP 2011	19	55.2	46.0	39.6	0.0	137.0	WB's WDI database
Foreign participation/market cap 2011	18	13.8	14.2	6.8	3.4	24.5	IMF's IFS database, WB's WDI database
Capital account openess 2011	19	0.0	-0.1	1.2	-1.2	2.4	Chinn-Ito index database

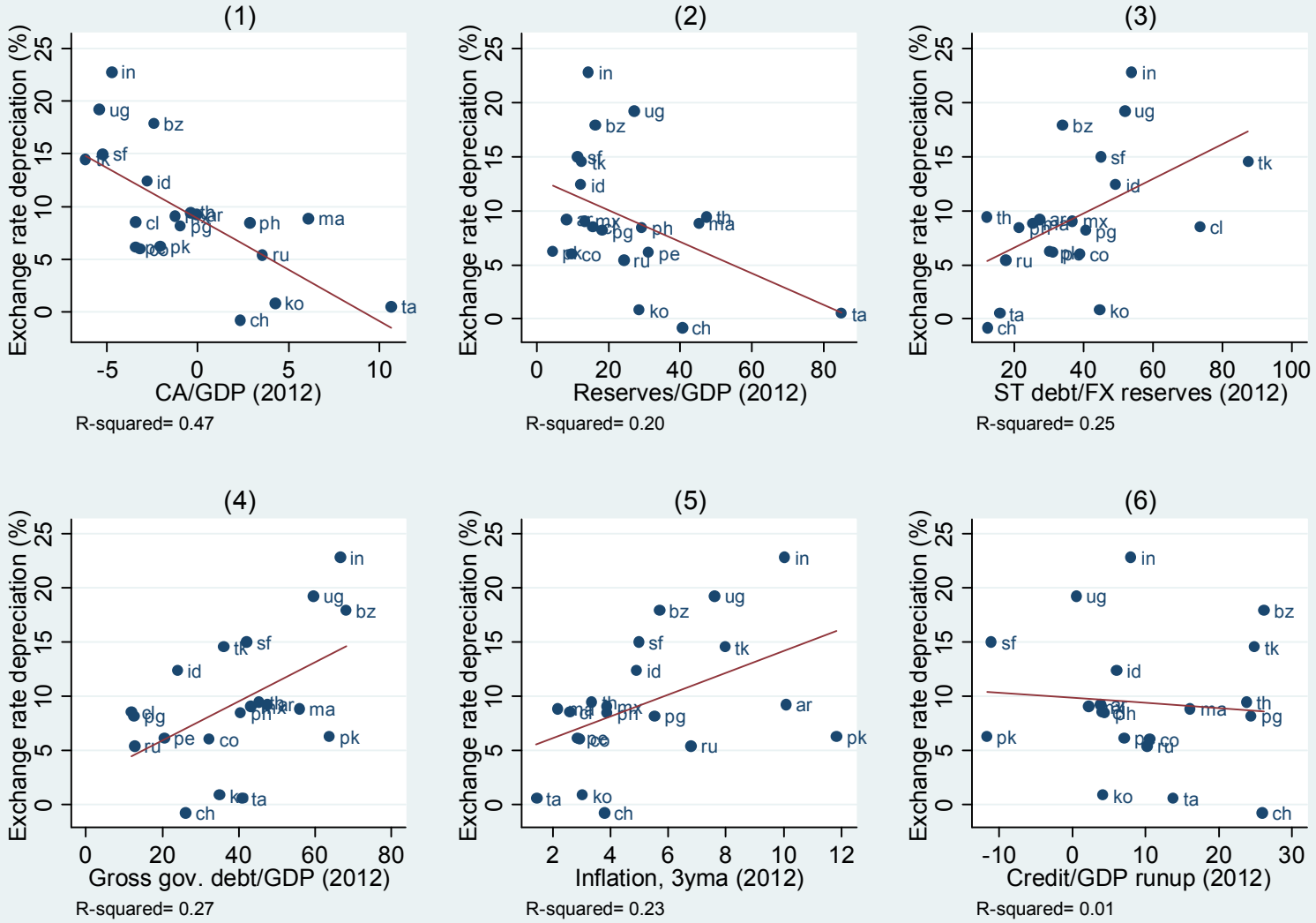
3. Econometric specification and data: Apr-Aug 2013

- Dispersion in financial performance across EMEs:



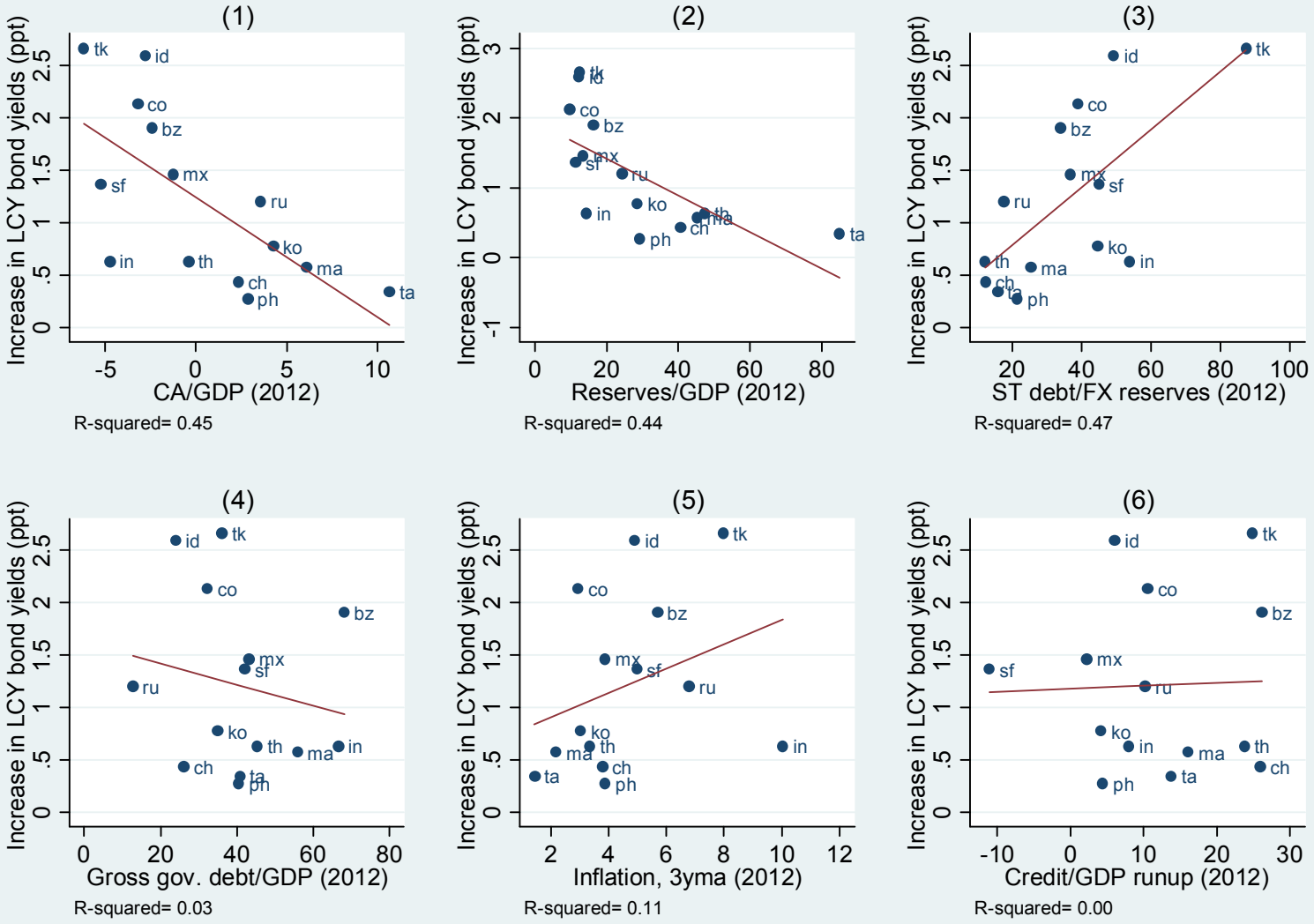
4. Question 1: Differentiation among EMEs in 2013

- XR depreciation over Apr-Aug 2013 (vertical axis) vs. fundamentals in 2012:



4. Question 1: Differentiation among EMEs in 2013

- Increase in bond yields in Apr-Aug 2013 (vertical axis) vs. fundamentals 2012:



4. Question 1: Differentiation among EMEs in 2013

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Exchange rate depreciation, April-August 2013 (%)						Depreciation pressure index, April-August 2013					
Macro fundamentals and policy	CA/GDP 2012	-0.82**						-0.084					
		(0.37)						(0.082)					
	Reserves/GDP 2012	0.039						-0.0051					
		(0.089)						(0.020)					
	Short-term ext. debt/reserves 2012	0.069						0.0056					
		(0.062)						(0.014)					
	Gov debt/GDP 2012	0.16**						0.023					
		(0.061)						(0.014)					
	Inflation, average 2010-12	0.13						0.15					
		(0.44)						(0.099)					
	Bank credit/GDP 5-year change, 2012	0.059						0.0030					
		(0.088)						(0.020)					
	Vulnerability index 2012		0.74***	0.75***	0.66***	0.76***	0.78***		0.14***	0.14***	0.14***	0.14***	0.14***
			(0.13)	(0.18)	(0.12)	(0.12)	(0.14)		(0.027)	(0.037)	(0.031)	(0.028)	(0.037)
	Growth forecast 2013 revision			1.03						0.11			
				(1.66)						(0.35)			
	Dummy, inflation targeter			0.97						-0.036			
				(2.12)						(0.45)			
	Dummy, XR floater			-0.98						-0.089			
				(3.68)						(0.78)			
More-in-more-out	Gross inflows/GDP, cumul. 2010-12				0.84***						0.043		
					(0.26)						(0.068)		
	REER appreciation, average 2009-12					0.55*						0.0079	
						(0.30)						(0.069)	
Financial structure	Market cap/GDP, 2011						0.048*						0.0037
							(0.024)						(0.0062)
	Foreign participation/market cap, 2011						0.13						0.014
							(0.12)						(0.032)
	Capital account openess						-0.066						-0.20
							(0.75)						(0.19)
	Constant	-2.39	-7.76**	-8.50*	-8.65***	-9.67***	-13.5***	-0.022	-1.52**	-1.42	-1.48*	-1.55**	-1.91*
		(4.58)	(3.12)	(4.52)	(2.87)	(3.13)	(4.00)	(1.02)	(0.65)	(0.95)	(0.76)	(0.71)	(1.03)
	Observations	20	20	19	19	20	18	20	20	19	19	20	18
	R-squared	0.72	0.64	0.61	0.76	0.70	0.75	0.65	0.61	0.56	0.57	0.61	0.65

4. Question 1: Differentiation among EMEs in 2013

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Increase in bond yields, April-August 2013 (ppt)						Stock market price increase, April-August 2013 (%)					
Macro fundamentals and policy	CA/GDP 2012	-0.051						0.59					
		(0.071)						(0.60)					
	Reserves/GDP 2012	-0.016						-0.046					
		(0.016)						(0.15)					
	Short-term ext. debt/reserves 2012	0.021*				0.033***		-0.077					
		(0.011)				(0.0077)		(0.093)					
	Gov debt/GDP 2012	-0.015						0.20*					
		(0.011)						(0.098)					
	Inflation, average 2010-12	-0.13						0.36					
		(0.092)						(0.75)					
	Bank credit/GDP 5-year change, 2012	0.023						-0.41**		-0.35**	-0.32*	-0.35*	-0.39**
		(0.016)						(0.16)		(0.15)	(0.18)	(0.17)	(0.16)
	Vulnerability index 2012		0.072**	0.074**	0.076**		0.086**		-0.074				
			(0.024)	(0.027)	(0.030)		(0.027)		(0.27)				
	Growth forecast 2013 revision			-0.94*						-4.38			
				(0.47)						(4.24)			
	Dummy, inflation targeter			0.52						-8.26**			
				(0.36)						(3.35)			
	Dummy, XR floater			-0.0094						4.04			
				(0.51)						(4.66)			
More-in-more-out	Gross inflows/GDP, cumul. 2010-12				-0.042						-0.077		
					(0.076)						(0.67)		
	REER appreciation, average 2009-12					0.14**						-0.66	
						(0.063)						(0.67)	
Financial structure	Market cap/GDP, 2011						0.0034						0.0058
							(0.0064)						(0.046)
	Foreign participation/market cap, 2011						-0.052						0.0012
							(0.033)						(0.25)
	Capital account openess						0.58**						-3.72**
							(0.24)						(1.45)
	Constant	1.84**	-0.42	-0.81	-0.34	-0.33	0.12	-5.58	-2.90	3.87	-1.23	0.81	-1.51
		(0.73)	(0.56)	(0.63)	(0.69)	(0.39)	(0.86)	(7.34)	(6.30)	(3.31)	(3.33)	(3.19)	(5.27)
	Observations	14	14	13	13	14	13	17	17	16	16	17	16
	R-squared	0.76	0.44	0.68	0.40	0.64	0.68	0.61	0.01	0.53	0.21	0.24	0.53

4. Question 1: Differentiation among EMEs in 2013

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Increase in EMBI spreads, April-August 2013 (ppt)						Increase in CDS spreads, April-August 2013 (ppt)					
Macro fundamentals and policy	CA/GDP 2012	-0.031					-0.061**	-0.034					
		(0.041)					(0.021)	(0.023)					
	Reserves/GDP 2012	-0.0048						0.0022					
		(0.011)						(0.0088)					
	Short-term ext. debt/reserves 2012	-0.00018						0.00026					
		(0.0064)						(0.0039)					
	Gov debt/GDP 2012	0.0053						0.0023					
		(0.0047)						(0.0040)					
	Inflation, average 2010-12	0.033						0.079					
		(0.044)						(0.046)					
	Bank credit/GDP 5-year change, 2012	-0.0054						0.00075					
		(0.0081)						(0.0074)					
	Vulnerability index 2012		0.034***	0.036***	0.033**	0.035**			0.032***	0.035**	0.030***	0.032***	0.031***
			(0.011)	(0.010)	(0.012)	(0.012)			(0.0077)	(0.011)	(0.0079)	(0.0081)	(0.0094)
	Growth forecast 2013 revision			-0.20*						0.14			
				(0.10)						(0.17)			
	Dummy, inflation targeter									-0.17			
										(0.13)			
	Dummy, XR floater									0.047			
										(0.18)			
More-in-more-out	Gross inflows/GDP, cumul. 2010-12				0.016						0.019		
					(0.028)						(0.018)		
	REER appreciation, average 2009-12					0.0091						-0.0055	
						(0.027)						(0.022)	
Financial structure	Market cap/GDP, 2011						0.00044						-0.00085
							(0.0020)						(0.0017)
	Foreign participation/market cap, 2011						0.022*						-0.0043
							(0.012)						(0.0086)
	Capital account openess						-0.060						-0.039
							(0.073)						(0.050)
	Constant	0.27	-0.31	-0.32	-0.34	-0.35	0.10	-0.015	-0.20	-0.15	-0.22	-0.18	-0.061
		(0.42)	(0.28)	(0.25)	(0.29)	(0.31)	(0.21)	(0.42)	(0.18)	(0.22)	(0.18)	(0.20)	(0.28)
	Observations	15	15	15	15	15	14	14	14	14	14	14	14
	R-squared	0.56	0.42	0.56	0.44	0.43	0.64	0.62	0.58	0.66	0.62	0.58	0.62

5. Question 2: Timing and persistence of differentiation in 2013

- Depreciation pressure index:

(a) Cumulative stress

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depreciation pressure index	Apr-May	Apr-Jun	Apr-Jul	Apr-Aug	Apr-Sep	Apr-Oct	Apr-Nov	Apr-Dec
Vulnerability index 2012	0.098*	0.12***	0.12***	0.14***	0.13***	0.11***	0.10**	0.10**
	(0.047)	(0.028)	(0.026)	(0.028)	(0.033)	(0.031)	(0.037)	(0.038)
Observations	18	18	18	18	18	18	18	18
R-squared	0.21	0.53	0.59	0.60	0.50	0.45	0.33	0.32

(b) Incremental stress

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depreciation pressure index	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec
Vulnerability index 2012	0.098*	0.084**	0.055	0.12***	-0.021	-0.082*	0.027	0.058
	(0.047)	(0.032)	(0.046)	(0.030)	(0.046)	(0.040)	(0.045)	(0.038)
Observations	18	18	18	18	18	18	18	18
R-squared	0.21	0.30	0.08	0.52	0.01	0.21	0.02	0.12

5. Question 2: Timing and persistence of differentiation in 2013

- Increase in bond yields:

(a) Cumulative stress

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Increase in bond yields (ppt)	Apr-May	Apr-Jun	Apr-Jul	Apr-Aug	Apr-Sep	Apr-Oct	Apr-Nov	Apr-Dec
Vulnerability index 2012	-0.013	0.022	0.047*	0.072**	0.077**	0.062**	0.076***	0.094***
	(0.011)	(0.023)	(0.025)	(0.024)	(0.028)	(0.021)	(0.023)	(0.027)
Observations	14	14	14	14	13	13	14	14
R-squared	0.11	0.07	0.22	0.44	0.40	0.44	0.47	0.50

(b) Incremental stress

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Increase in bond yields (ppt)	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec
Vulnerability index 2012	-0.013	0.036*	0.025*	0.026***	0.0059	-0.015	0.015	0.018**
	(0.011)	(0.017)	(0.013)	(0.0073)	(0.0070)	(0.0093)	(0.011)	(0.0072)
Observations	14	15	15	15	14	14	14	15
R-squared	0.11	0.25	0.22	0.50	0.06	0.18	0.13	0.32

6. Question 3: Differentiation during past stress episodes

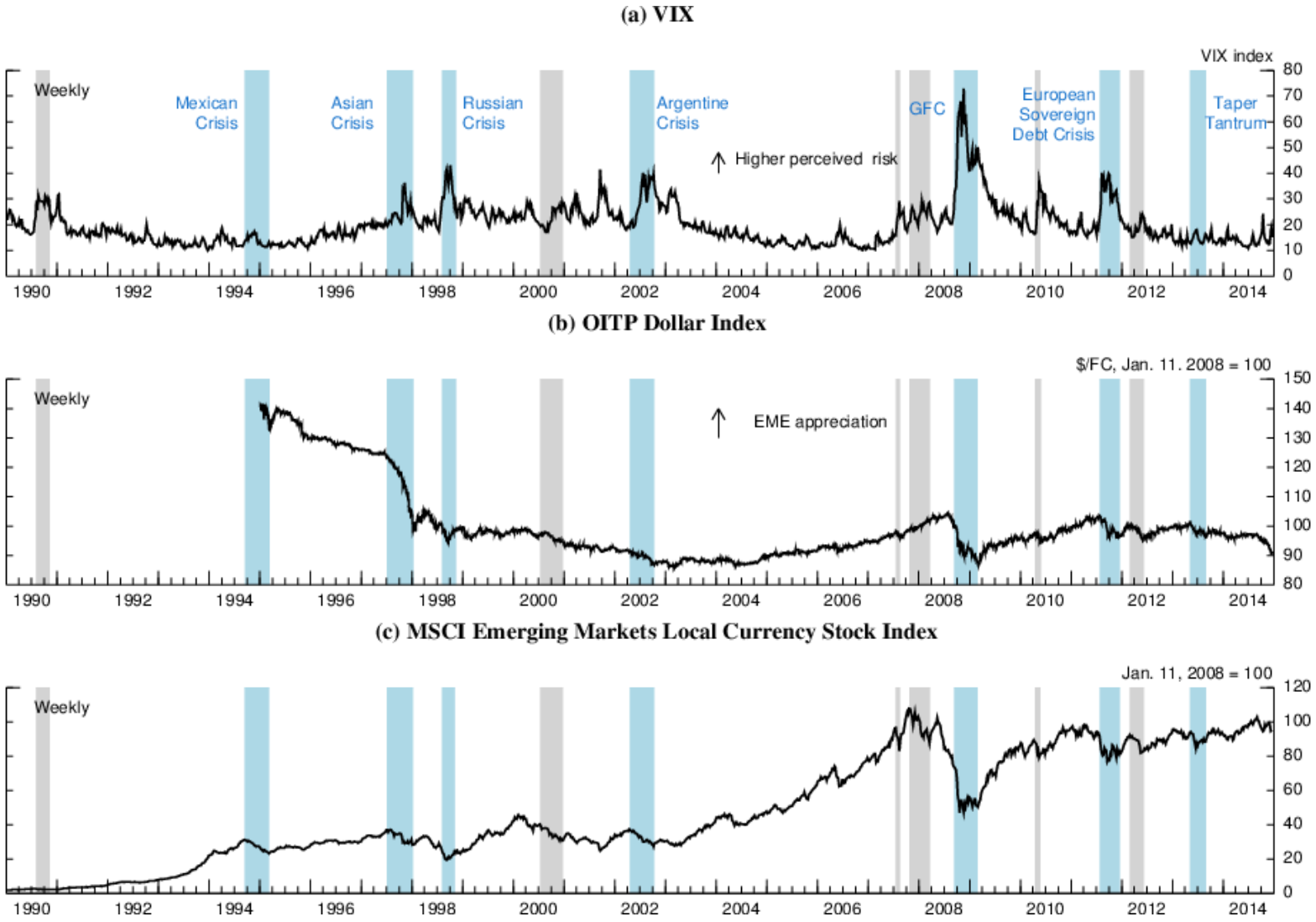
- Identify past events based on VIX, exchange rate index, stock market index;

- VIX:
  - Take deviations around HP trend;
  - Select consecutive observations 2 st. dev. above trend, and adjacent observations 1 st. dev. above;
  - Select the start and end dates.

- EME exchange rate and stock market index:
  - Take % change relative to prior 6-months' maximum (weekly);
  - Select observations with depreciation >5%, stock market declines > 10%;
  - Maximum is the start date, trough is the end date.

6. Question 3: Differentiation during past stress episodes

- Identify past events based on VIX, exchange rate index, stock market index;
- Found 13 financial stress episodes in EMEs; focus on 7 events (in blue):

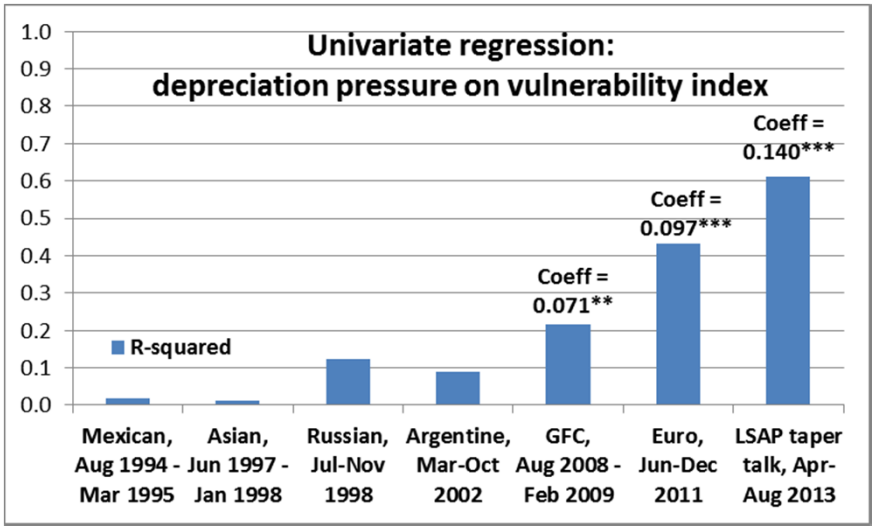


6. Question 3: Differentiation during past stress episodes

- Depreciation pressure has become increasingly correlated with vulnerability since the late 2000s;
- We find no evidence for stock markets for either past or recent events.
- Limited historical availability for bond yields, EMBI and CDS spreads.

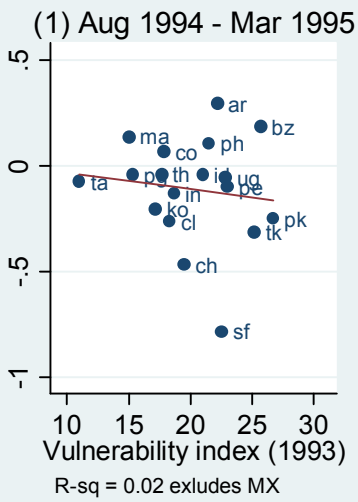
(a) Dependent variable: depreciation pressure index

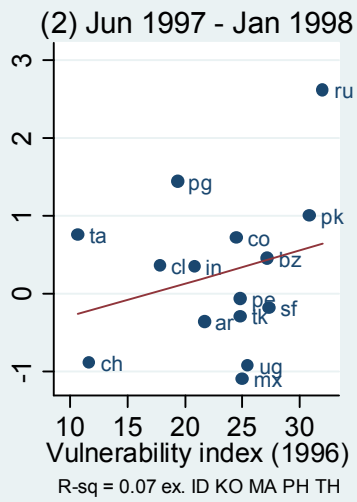
Dependent variable: **Depreciation pressure index**	(1) Aug 1994 - Mar 1995	(2) Jun 1997 - Jan 1998	(3) Jul-Nov 1998	(4) Mar-Oct 2002	(5) Aug 2008 - Feb 2009	(6) Jun-Dec 2011	(7) Apr-Aug 2013
Vulnerability index (y-1)	-0.0079	0.042	0.078	0.055	0.071**	0.097***	0.14***
	(0.015)	(0.043)	(0.051)	(0.043)	(0.033)	(0.026)	(0.027)
Observations	18	15	19	18	19	20	20
R-squared	0.02	0.07	0.12	0.09	0.21	0.43	0.61

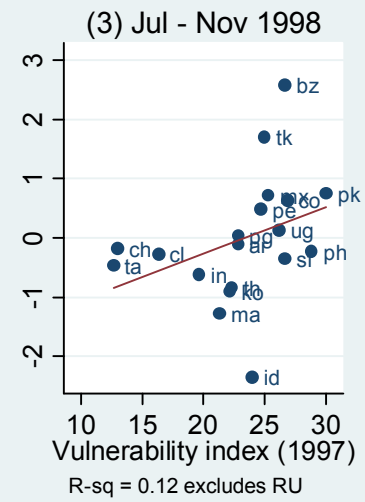


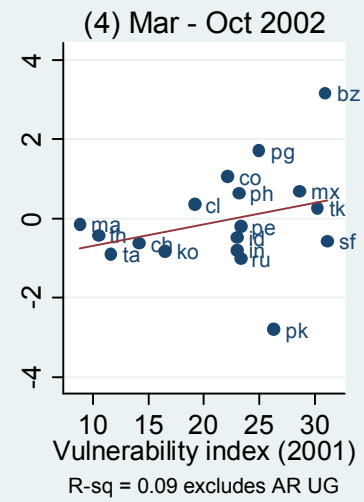
6. Question 3: Differentiation during past stress episodes

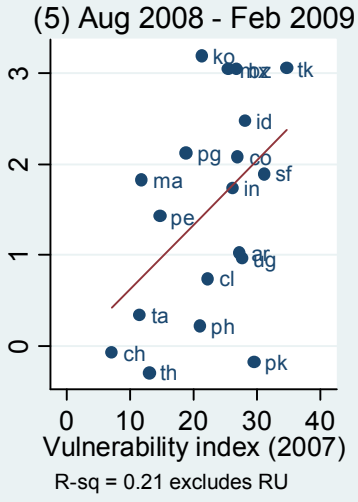
- Depreciation pressure index (vertical axis) vs. vulnerability index:

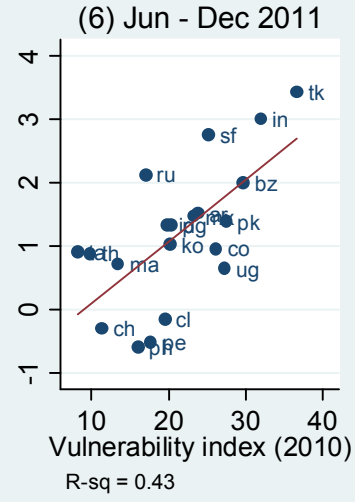


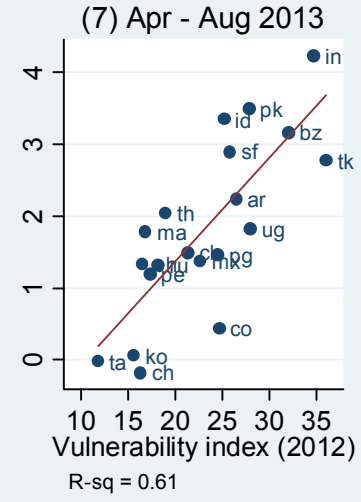






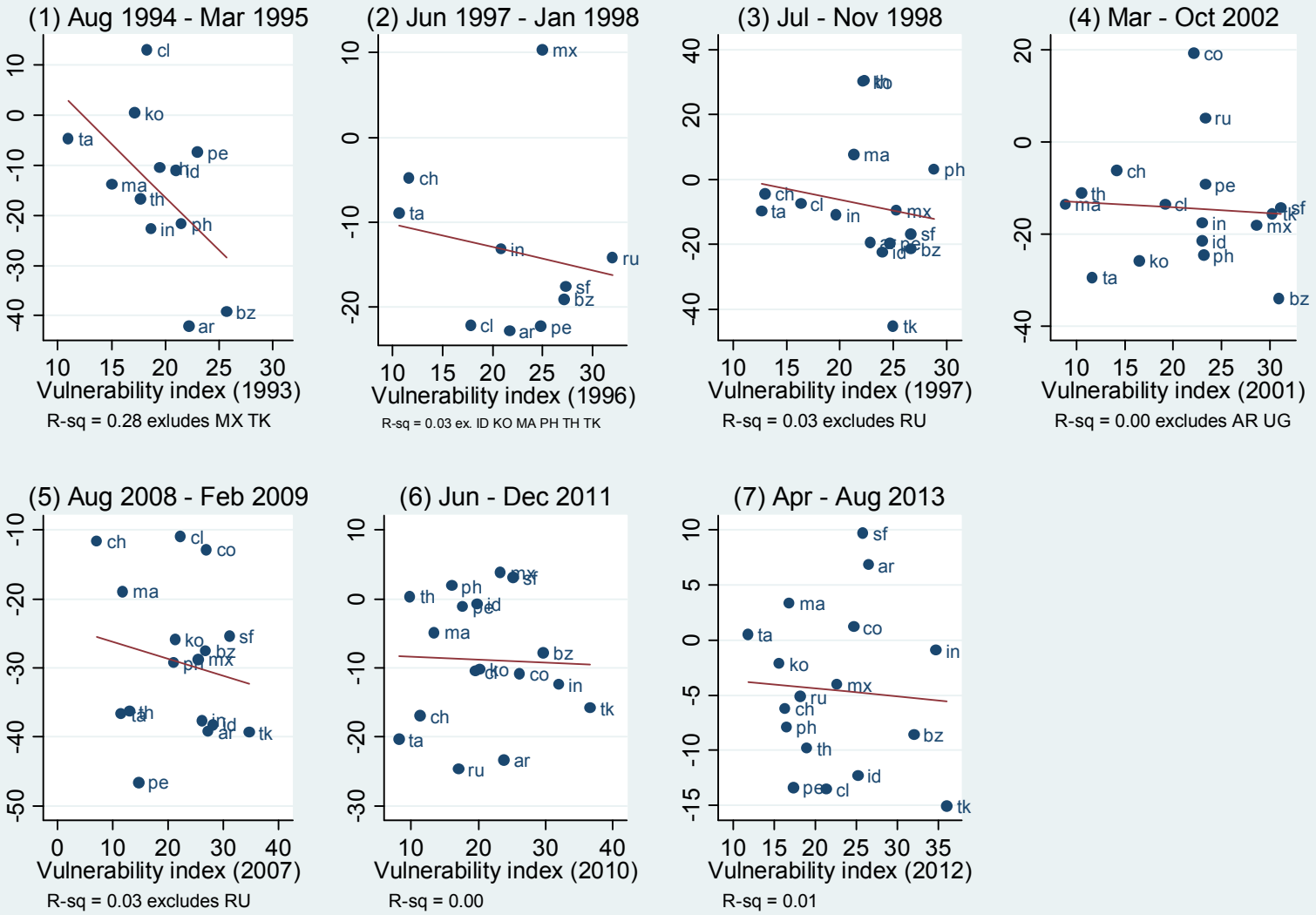






6. Question 3: Differentiation during past crisis episodes

- Change in stock market prices (vertical axis) vs. vulnerability index:



7. Conclusion

1. **Differentiation was related to country-specific fundamentals.**
   - Develop an index of relative EME vulnerability to capture the strength of macro fundamentals.
   - We find evidence of differentiation based on macro fundamentals for exchange rates, bond yields, EMBI and CDS spreads.
   - No evidence for stock markets.
   - Controlling for fundamentals, "more-in-more-out" and financial market structure also mattered.

2. **In 2013, differentiation set in early in the stress episode, and its effect persisted throughout the event.**

3. **We find no evidence of differentiation during the 1990s and early 2000s, but increasingly for the GFC, the euro crisis, and the taper tantrum.**
   - Important caveats apply: the quality and dispersion of macro fundamentals changed over time; the origin of stress episodes shifted from the EMEs toward advanced economies.

Thank you!

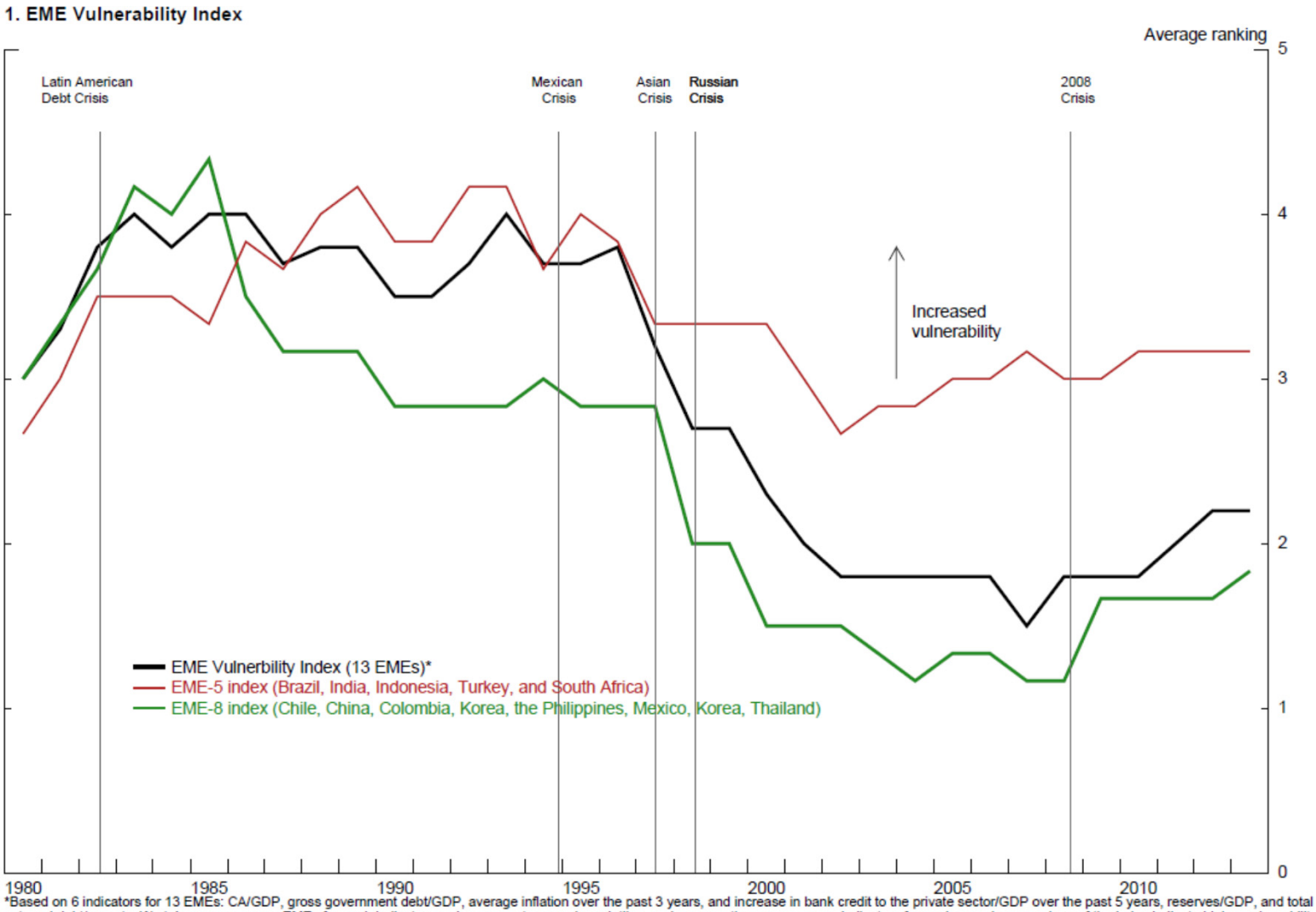
Additional slides

EME vulnerability index over time

- Based on six macro indicators:
  - (1) Current account/GDP
  - (2) Total ext. debt/exports
  - (3) Foreign exchange reserves/GDP
  - (4) Gross government debt/GDP
  - (5) Inflation over past three years
  - (6) Δ(Bank credit/GDP) over past five years

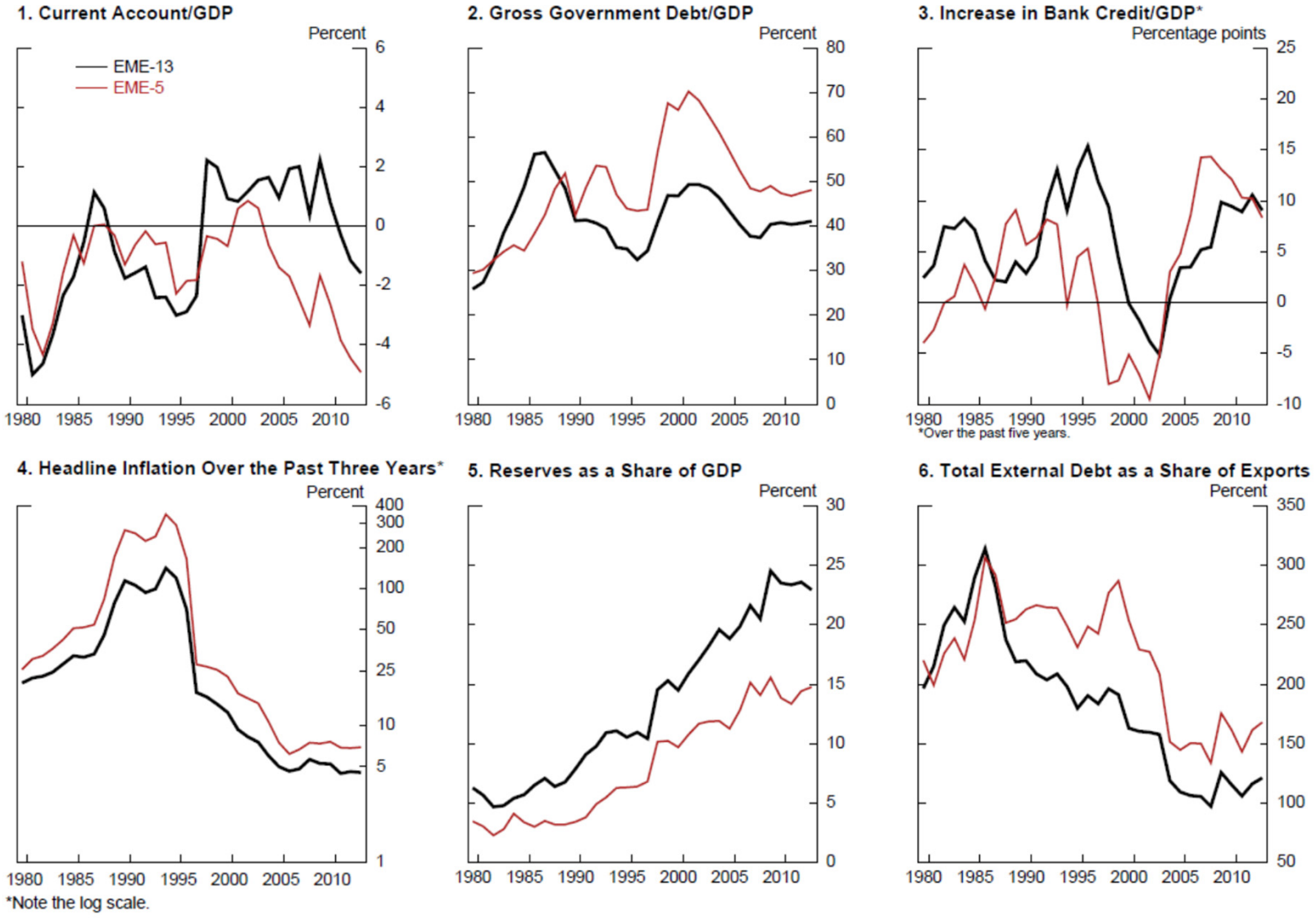
- For each indicator, assign scores to years by quintiles, with higher scores indicating more vulnerability.
- Sub-indexes use the same quintile cutoffs as the aggregate index.
- Average scores across indicators for each year.

EME vulnerability index over time



*Based on 6 indicators for 13 EMEs: CA/GDP, gross government debt/GDP, average inflation over the past 3 years, and increase in bank credit to the private sector/GDP over the past 5 years, reserves/GDP, and total external debt/exports. We take means across EMEs for each indicator, assign scores to years by quintiles, and average the scores across indicators for each year. Larger values of the index indicate higher vulnerability. EMEs included are Brazil (BZ), Chile (CL), China (CH), Colombia (CO), India (IN), Indonesia (ID), Korea (KO), Malaysia (MA), Mexico (MX), the Philippines (PH), South Africa (SA), Thailand (TH) and Turkey (TK).

EME vulnerability indicators over time



EME vulnerability indicators over time

1. Current Account as a Share of GDP

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil	-3.0	-1.7	-0.9	-0.8	-2.6	-3.4
India	-1.8	-1.2	0.3	-2.0	-4.5	-4.4
Indonesia	-2.7	-1.2	3.2	1.4	-2.0	-3.4
South Africa	0.9	-0.0	-1.1	-5.3	-5.2	-6.1
Turkey	-1.2	-0.9	-2.1	-5.1	-7.7	-7.4
Fragile 5	-1.6	-1.0	-0.1	-2.4	-4.4	-4.9
Other EMEs	-2.3	-1.6	2.0	3.9	1.1	0.5
EME-13	**-2.0**	**-1.4**	**1.2**	**1.5**	**-1.0**	**-1.6**

*2013 is the projection from the October WEO.

2. Fiscal Balance as a Share of GDP

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil			-3.6	-2.7	-2.2	-1.2
India		-6.5	-8.8	-7.7	-8.4	-8.3
Indonesia			-1.2	-0.8	-1.6	-2.8
South Africa			-1.2	-1.7	-4.5	-4.8
Turkey				-2.4	-1.3	-2.2
Fragile 5				-3.2	-3.8	-4.4
Other EMEs			-1.6	-0.8	-1.4	-1.8
EME-13				**-1.7**	**-2.3**	**-2.8**

*2013 is the projection from the October IMF Fiscal Monitor.

3. Headline Inflation

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil	205.7	823.6	8.0	5.0	5.8	6.1
India	8.8	9.3	4.5	7.4	10.5	9.8
Indonesia	10.3	11.9	12.4	8.6	5.2	5.5
South Africa	14.5	10.7	5.3	5.4	5.3	5.5
Turkey	50.0	76.7	43.2	8.8	7.6	7.6
Fragile 5	57.8	186.5	14.7	7.1	6.9	6.9
Other EMEs	18.9	11.9	4.0	3.9	3.1	3.0
EME-13	**33.9**	**79.0**	**8.1**	**5.1**	**4.5**	**4.5**

*2013 is an estimate based on inflation data through December 2013 (except November for Malaysia.)

4. Government Debt as a Share of GDP

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil	52.4	59.6	71.9	65.5	67.0	68.3
India	40.4	69.2	80.7	73.0	66.8	67.2
Indonesia	30.3	45.4	67.6	32.5	25.1	26.2
South Africa	30.0	41.6	38.5	31.2	41.6	43.0
Turkey	35.8	34.3	63.9	43.0	37.1	36.0
Fragile 5	37.8	50.0	64.5	49.0	47.5	48.2
Other EMEs	46.2	31.7	36.5	33.3	36.5	36.6
EME-13	**43.0**	**38.8**	**47.3**	**39.4**	**40.8**	**41.1**

*2013 is the projection from the October WEO.

EME-13: Brazil, Chile, China, Colombia, India, Indonesia, Korea, Malaysia, the Philippines, Mexico, South Africa, Thailand, and Turkey.

EME vulnerability indicators over time

5. Increase in Bank Credit/GDP Over the Past Five Years

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil	3.0	-6.9	-6.1	16.3	23.1	21.9
India	3.6	-0.9	8.1	13.5	5.6	2.3
Indonesia	3.2	11.4	-21.2	3.7	4.9	4.6
South Africa	2.0	5.9	2.6	11.8	-9.7	-12.3
Turkey	-2.7	1.3	0.7	17.1	24.2	25.2
Fragile 5	1.8	2.2	-3.2	12.5	9.6	8.3
Other EMEs	6.8	13.8	0.1	3.1	9.5	9.5
EME-13	**4.9**	**9.3**	**-1.2**	**6.7**	**9.5**	**9.1**

*2013 is an estimate based on data availible for 2013:Q2.

6. Reserves as a Share of GDP

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil	3.4	5.6	7.0	12.4	16.0	17.2
India	2.4	5.1	13.8	20.0	16.3	16.8
Indonesia	6.5	10.7	15.6	12.2	12.4	11.5
South Africa	0.7	1.8	5.4	10.7	11.6	12.6
Turkey	2.9	8.5	14.1	16.2	14.6	15.7
Fragile 5	3.2	6.4	11.2	14.3	14.2	14.8
Other EMEs	7.6	14.0	21.2	26.8	29.0	28.1
EME-13	**5.9**	**11.0**	**17.3**	**22.0**	**23.3**	**23.0**

*2013 is an estimate based on data availible for December 2013 (except November for Colombia and Turkey).

7. Total External Debt as a Share of Exports

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil	397.5	392.3	294.8	156.6	178.7	196.6
India	304.1	291.7	131.0	133.7	120.8	124.6
Indonesia	168.6	229.4	156.4	128.7	128.7	142.4
South Africa	114.4	121.9	107.1	112.2	129.0	135.4
Turkey	247.0	261.6	322.9	239.5	230.2	241.1
Fragile 5	246.3	259.4	202.4	154.1	157.5	168.0
Other EMEs	255.9	159.5	108.7	82.2	86.8	89.8
EME-13	**252.2**	**197.9**	**144.8**	**109.9**	**114.3**	**121.0**

*2013 is an estimate based on data on external debt availible for 2013:Q2 (except Q1 for Argentina) and on exports through November or December.

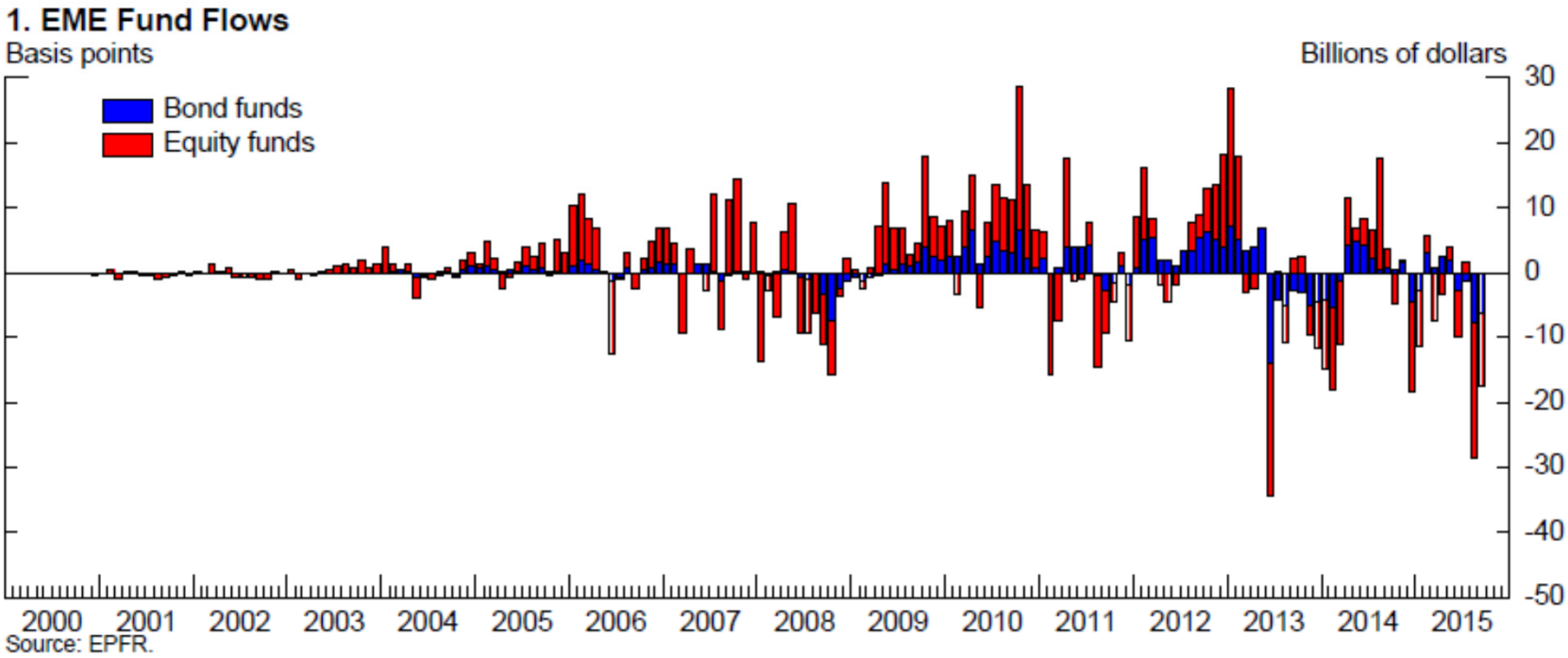
8. Real GDP Growth

	1980-1989	1990-1999	2000-2005	2006-2010	2011-2013	2013*
Brazil	2.9	1.7	3.0	4.5	1.9	2.2
India	5.9	5.8	6.4	8.7	5.7	4.7
Indonesia	5.8	4.3	4.8	5.7	6.1	5.6
South Africa	2.2	1.4	3.9	3.3	2.7	2.0
Turkey	6.8	4.1	5.0	3.4	4.8	3.8
Fragile 5	4.7	3.4	4.6	5.1	4.3	3.7
Other EMEs	5.4	5.6	4.8	4.8	4.8	4.3
EME-13	**5.5**	**5.1**	**4.8**	**5.0**	**4.6**	**4.1**

*2013 is staff projects except South Africa and Turkey, which is the January Consensus projection.

EME-13: Brazil, Chile, China, Colombia, India, Indonesia, Korea, Malaysia, the Philippines, Mexico, South Africa, Thailand, and Turkey.

EME financial markets



EME financial markets