Emerging Market Corporate Leverage and
Global Financial Conditions

Hong Kong Monetary Authority
12 October 2017
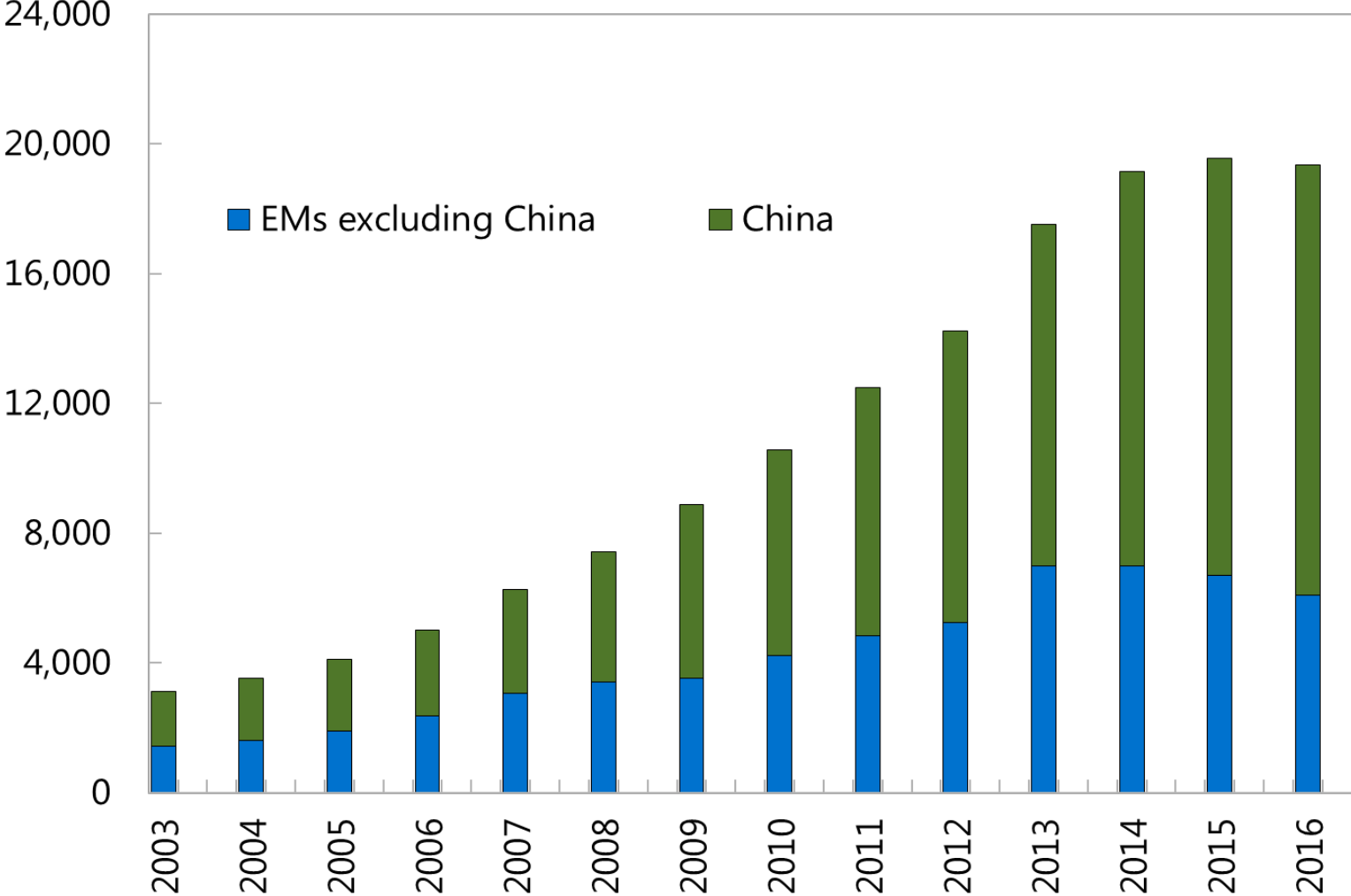
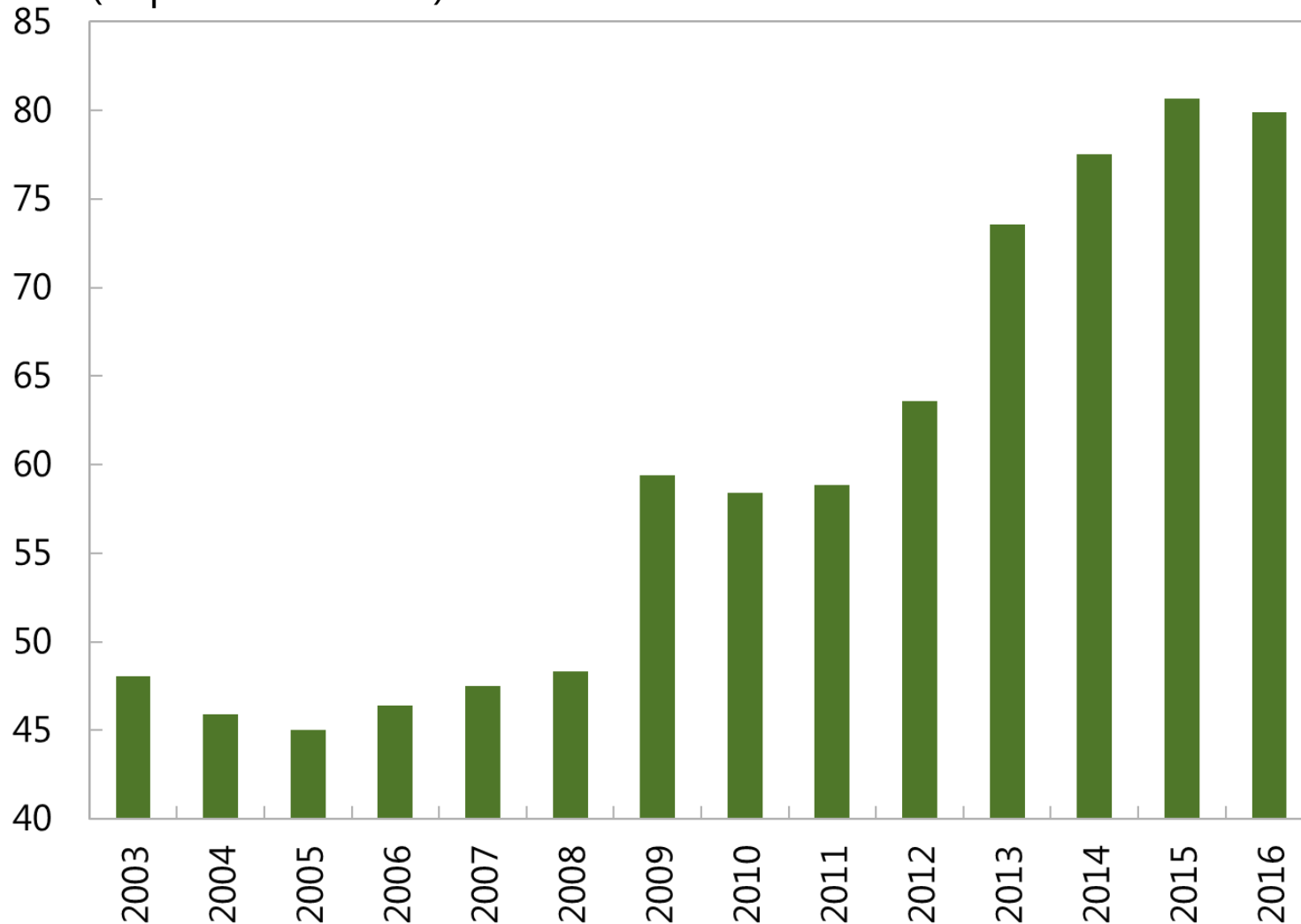**Adrian Alter**

(joint work with Selim Elekdag)

EM Corporate Debt on the Rise

EM Total Corporate Debt
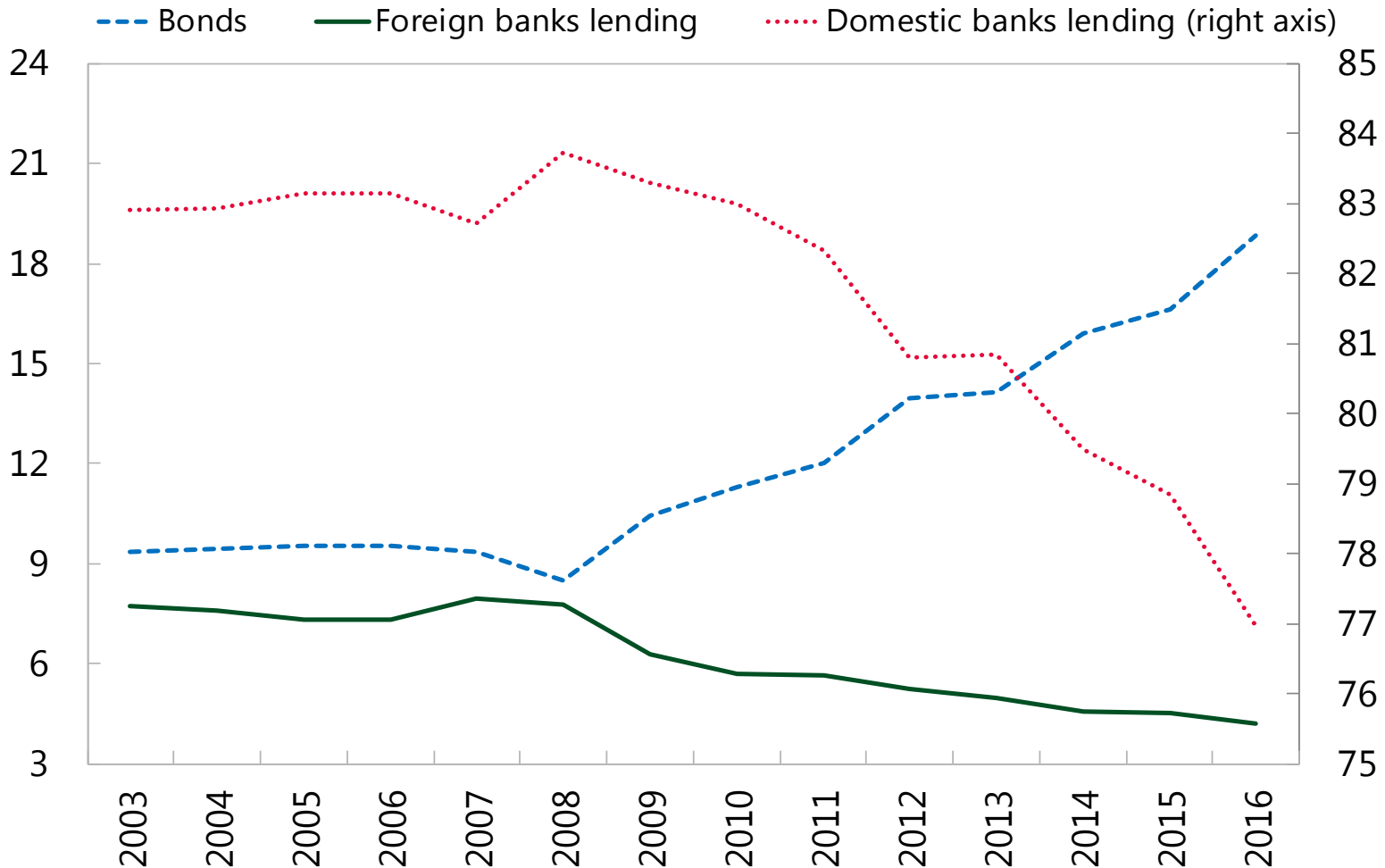(billion U.S. dollars)

EM Corporate Debt on the Rise

EM Total Corporate Debt
(In percent of GDP)

3

Market-based Financing Gaining Traction

Major EM Corporate Debt Composition
(Percent of total debt)

EM Corporate Bond Currency Composition

Major EM Corporate Bond Currency Composition
(Billion of U.S. dollars)
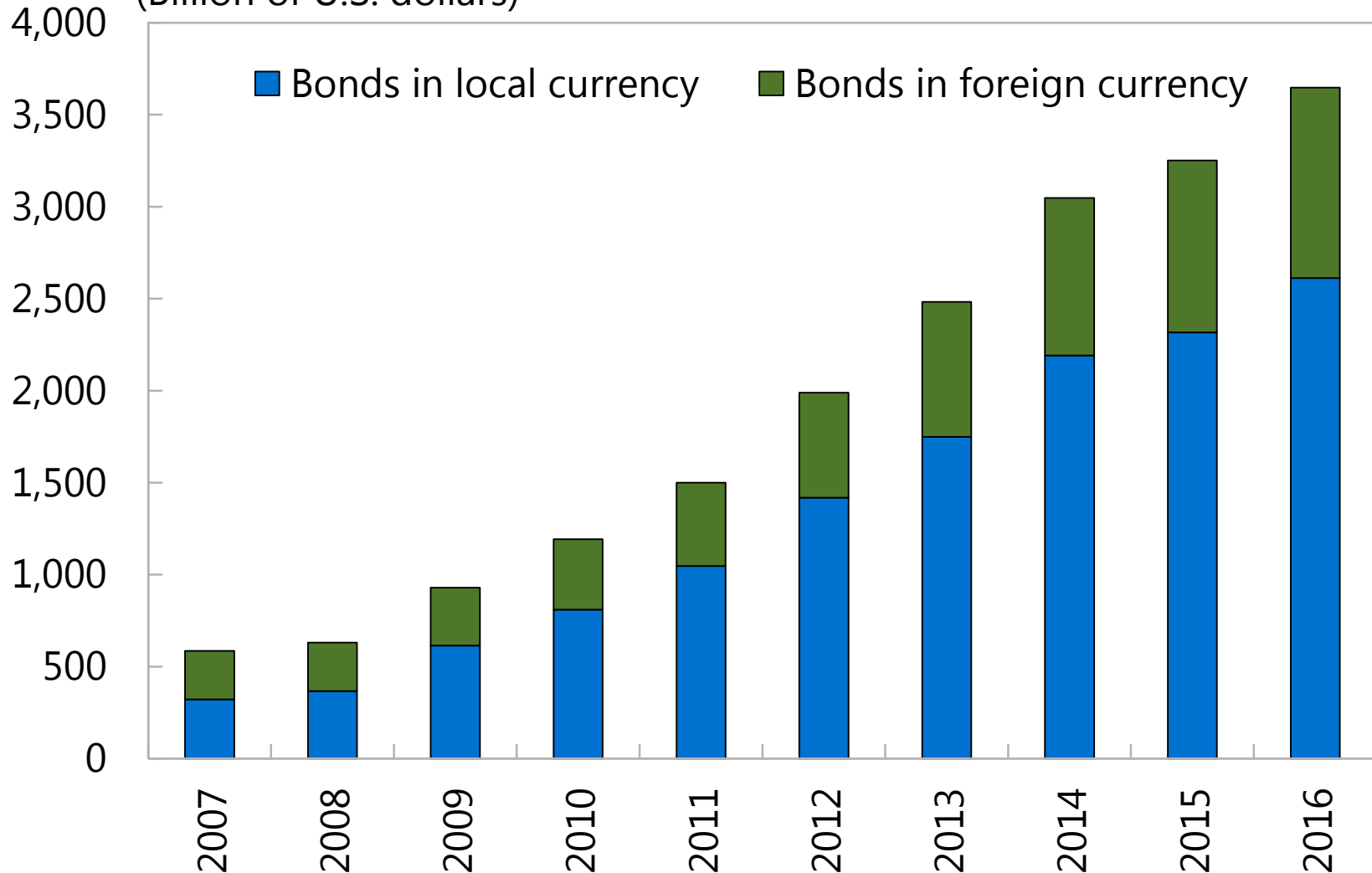
Firm-level Data Affirm the Recent Uptrend

Aggregate- and Firm-Level Measures of Emerging Market Economies Corporate Leverage
(Index; 2007 = 100 ; balanced sample)
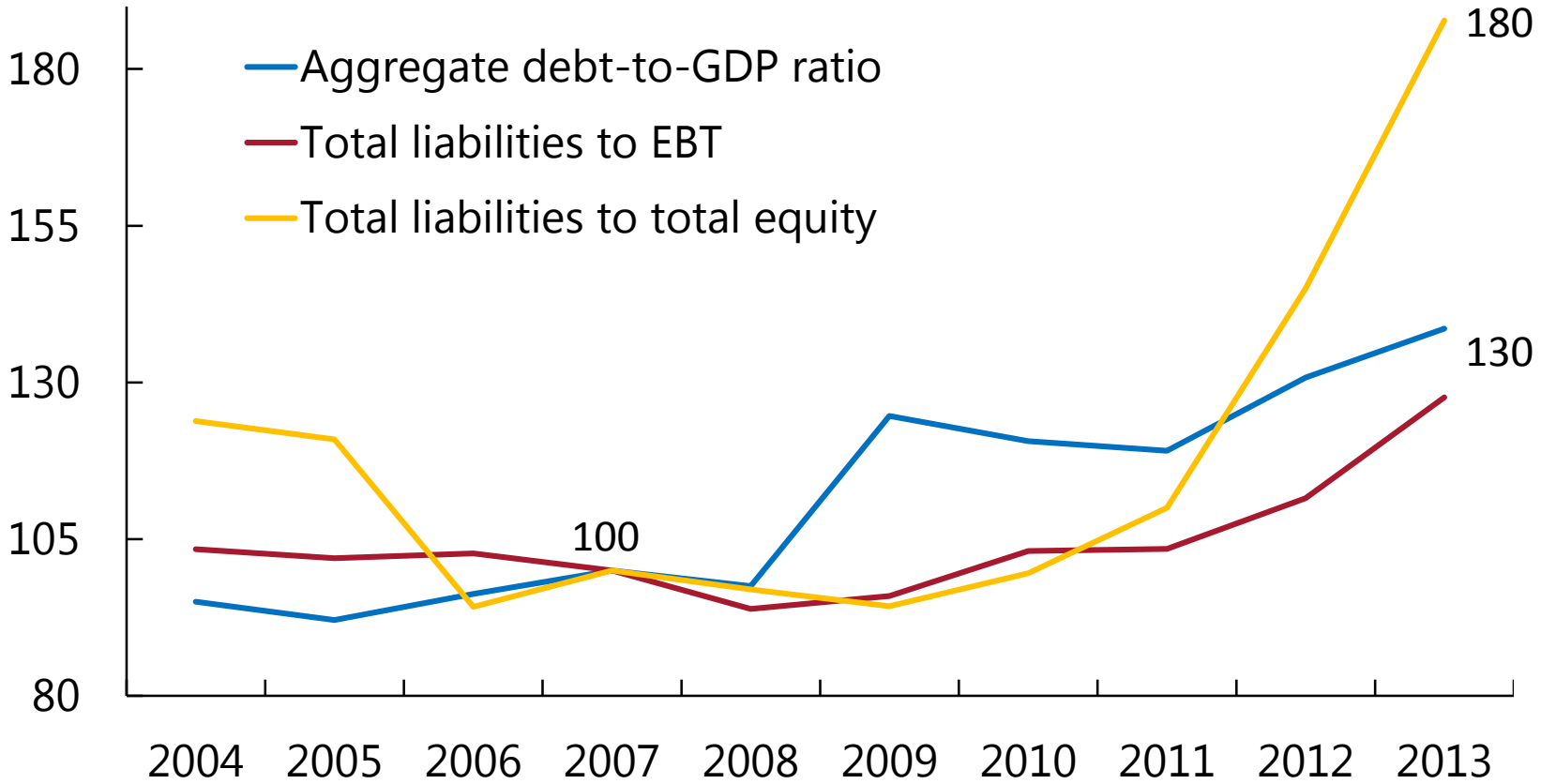
Higher Leverage in China and Construction Sector Firms

Emerging Market Economies Corporate Leverage
(Percent, ratio of total liabilities to total equity)
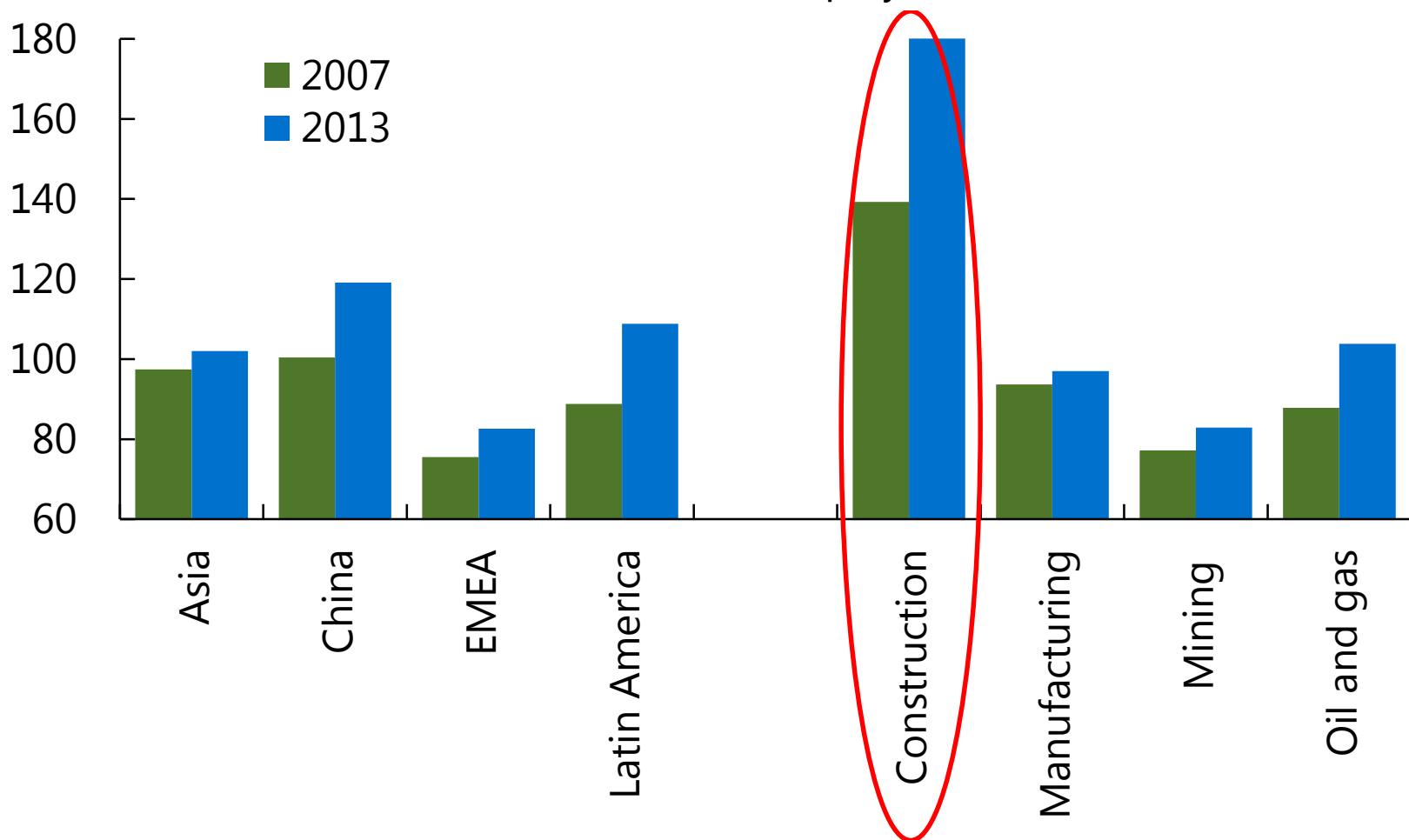
Interest Coverage Ratios have declined substantially

(EBITDA to interest expense, multiples)

2010   2016
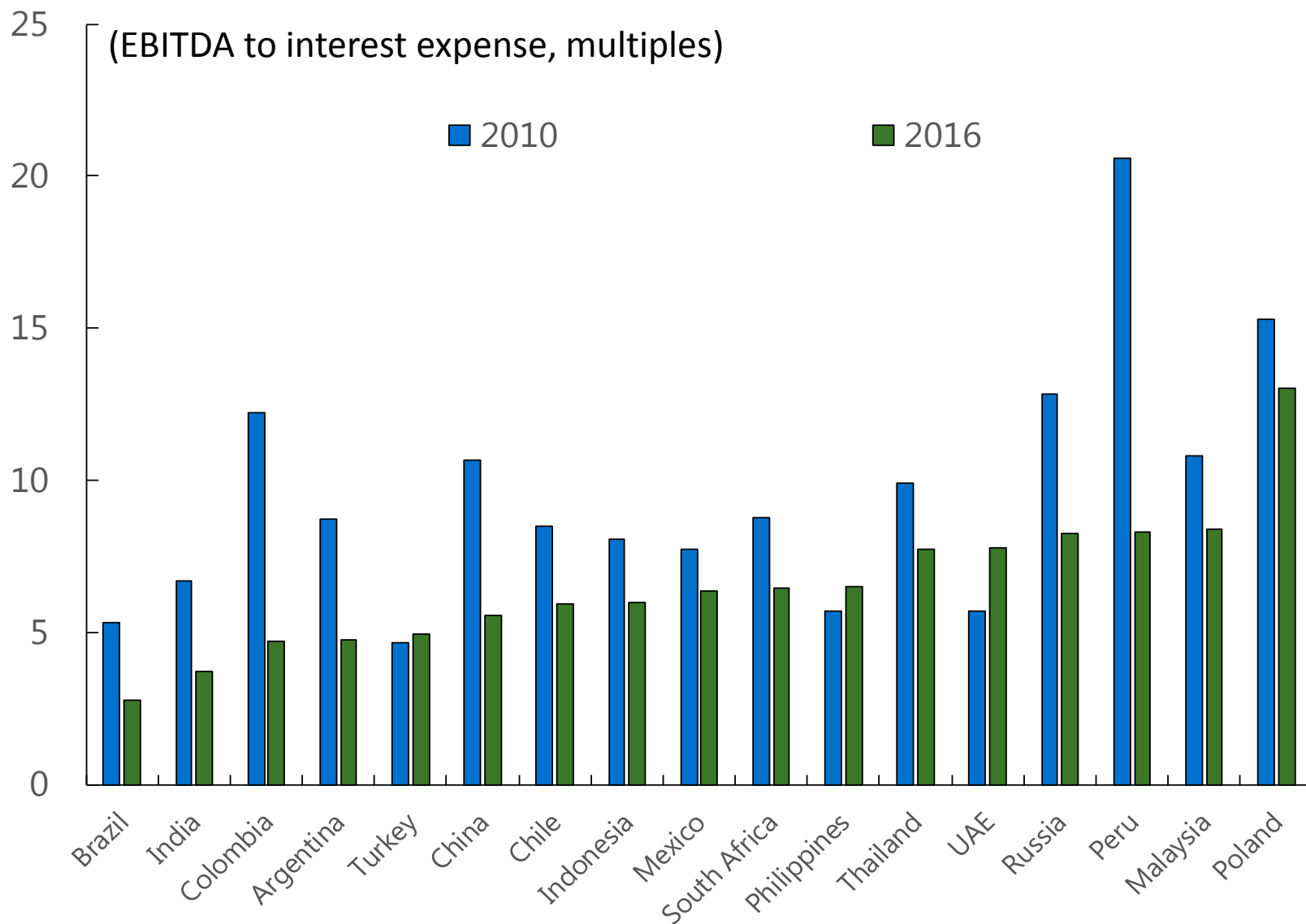
Global Financial Conditions Were Exceptionally Accommodative in Recent Years

Global Shadow Rates
(Percent)
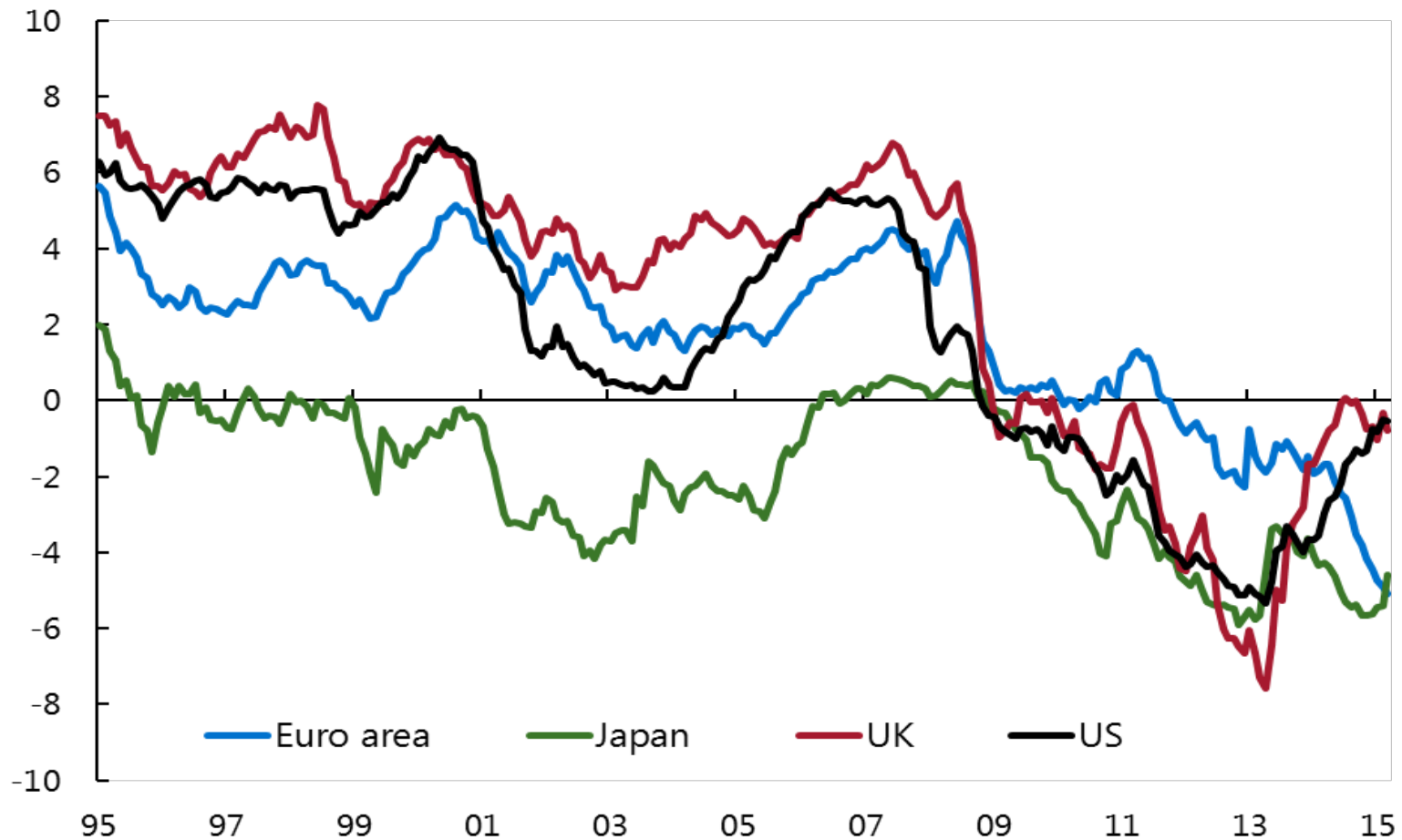
Key Questions

1. Are more accommodative global financial conditions associated with higher corporate leverage growth?

2. What is the role of specific country characteristics such as financial openness or the exchange rate regime?

3. Through which channels do global financial conditions influence EM corporate leverage growth?

Selected Literature Review

- **Corporate Structure**: Frank and Goyal (2009), Rajan and Zingales (1998), Lemmon, Roberts, and Zender (2008), Kalemli-Ozcan, Sorensen, and Yesiltas (2012)

- **Capital Flows**: Calvo, Leiderman, Reinhart (1993; 1996), Forbes and Warnock (2012), Cerutti, Claessens, and Ratnovski (2014), Sapriza et al. (2016)

- **Global Financial Conditions**: Bruno and Shin (2015), Miranda-Agrippino and Rey (2015), Feyen et al. (2015), Gozzi et al. (2015)

Potential Transmission Channels

- **Monetary Policy:** Domestic monetary policy in EMs reacts to lowering policy rates in AEs, to alleviate currency appreciation

- **Balance Sheet:** Looser monetary policy -> firm assets appreciate which in turn allows for higher firm valuations and relaxed borrowing constraints

- **Cross-border Lending:** AE banks "search" for higher yields abroad, and thus lend to riskier projects/firms in EMs

Main Findings

- Compelling evidence that US monetary conditions are **positively associated** with faster EM corporate leverage growth: A 1 pp decline in US policy rate is associated with ¼ of average leverage increase

- Effects are **more pronounced** for firms with relatively high external financing dependence, SMEs, and firms with less collateral

- Impact is **greater** for firms in more financially open EMs with more rigid exchange rate regimes

Overview: Data & Methodology

- Panel analysis where firm, country, and global factors are jointly combined -> firm leverage growth

- Use more than **400,000 firms** (with more than ½ SMEs) from 24 major EMEs (Orbis database) over the 2004-2013 period

- **Robustness**: Different leverage measures (e.g., TL/TA, NTL/TA, TA/TE, NTA/TE), different proxies for global financing conditions (e.g., global policy rates, monetary policy shocks), different types of FE and clustering

Overview: Data & Methodology

$$\Delta Leverage_{i,s,c,t} = \alpha * Monetary\ Conditions_t + \delta * Controls_{i,s,c,t-1}$$

$$+\boxed{\beta} * Monetary\ Conditions_t * Financial\ Constraints_s$$

$$+FE + \varepsilon_{i,s,c,t}$$

where:
- *Controls* are lagged firm profitability, size, and tangibility
- *Monetary Conditions* are proxied by the inverted US "shadow interest rate" (ISR = -SR)
- *Financial Constraints* are measured by sector's dependence on external finance (Rajan and Zingales 1998) or collateral availability
- Regressions include firm and time-related fixed effects (FE)

Baseline: Leverage and Financial Conditions

Leverage	(1)	(2)	(3)	(4)	(5)
Sales	-1.651***	-1.697***	-1.747***	-1.821***	-1.813***
	(0.123)	(0.120)	(0.121)	(0.121)	(0.122)
Profitability	0.107***	0.103***	0.105***	0.107***	0.108***
	(0.00549)	(0.00471)	(0.00469)	(0.00513)	(0.00513)
Tangibility	0.0764***	0.0773***	0.0784***	0.0780***	0.0782***
	(0.00297)	(0.00306)	(0.00312)	(0.00313)	(0.00315)
Macroeconomic conditions	0.197***	0.188***	0.132***		
	(0.0147)	(0.0147)	(0.0148)		
Inverted shadow rate	0.0879***	0.0794***			
	(0.0122)	(0.00941)			
Inverted shadow rate x		0.0386***	0.0376***	0.0329***	0.0174**
Financial dependence		(0.0108)	(0.00972)	(0.00928)	(0.00727)
Observations	1,424,409	1,363,751	1,363,751	1,363,844	1,363,844
R-squared (within)	0.010	0.010	0.011	0.014	0.015
Fixed effects					
Firm	Yes	Yes	Yes	Yes	Yes
Time			Yes		
Country-time				Yes	Yes
Sector-time					Yes

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Leverage, Financial Openness, and Exchange Rate Regimes

Leverage	(1)	(2)	(3)	(4)	(5)	(6)
Relative capital account openness	Less open	More open			Less open	More open
Relative exchange rate flexibility			More flexible	Less flexible	More flexible	Less flexible
Sales	-0.687***	-1.952***	-2.026***	-0.868***	-1.791***	-1.256***
	(0.0974)	(0.127)	(0.129)	(0.0851)	(0.172)	(0.140)
Profitability	1.775***	2.779***	3.018***	2.413***	4.723***	1.041*
	(0.317)	(0.428)	(0.429)	(0.409)	(0.881)	(0.608)
Tangibility	0.0733***	0.0794***	0.0758***	0.0800***	0.0428***	0.0745***
	(0.00383)	(0.00459)	(0.00478)	(0.00402)	(0.0107)	(0.00752)
Macroeconomic conditions	0.249***	-0.0278	-0.189***	0.159***	-1.647***	0.141***
	(0.0376)	(0.0208)	(0.0329)	(0.0212)	(0.273)	(0.0190)
Inverted shadow rate x	0.0216**	0.0300***	0.0159*	0.0672***	0.00383	0.0716***
Financial dependence	(0.0103)	(0.00735)	(0.00881)	(0.0121)	(0.0264)	(0.0129)
Observations	635,988	725,780	833,340	528,428	211,589	104,029
R-squared (within)	0.004	0.013	0.013	0.007	0.015	0.016
Fixed effects						
Firm	Yes	Yes	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes	Yes	Yes

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Time	Yes	Yes	Yes	Yes	Yes	Yes

Results: Summary

- **Global financial conditions** are found to be a reliable determinant of firm-level leverage dynamics in EMs.

- This effect is **more pronounced** for sectors that depend more on external financing and for firms in more financially open EMs with less flexible exchange rate regimes.

- These findings suggest that U.S. monetary conditions affect EM firms' leverage growth in part by influencing domestic interest rates and by relaxing corporate borrowing constraints.

- Robustness exercises show **relative higher effects** for financially constrained firms such as SMEs and firms with less collateral.

Policy Implications

- What about the **tightening cycle**? Are EM firms prepared for it? How can policymakers better react?

- **Macroprudential** policies could limit excessive increases in corporate sector leverage intermediated by banks (e.g., capital requirements, risk weights, limits on sectoral exposures).

- EMs should better prepare for corporate distress and sporadic failures; e.g., should reform **insolvency regimes**.

Thank you

Adrian Alter

(joint work with Selim Elekdag)