



BANK FOR INTERNATIONAL SETTLEMENTS

# Exchange rates and monetary policy frameworks in emerging market economies

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\* The views expressed here are mine, not necessarily those of the Bank for International Settlements.



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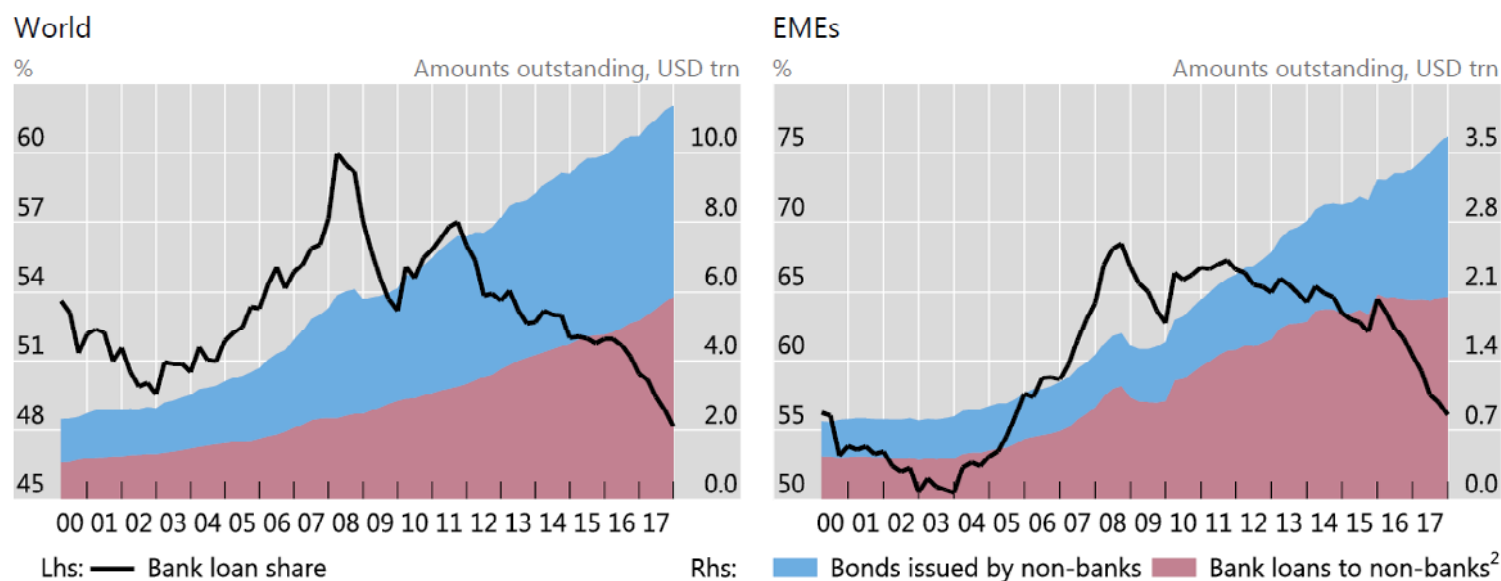
## Two structural developments since 1990s EME crises

- Dollar intermediation has shifted from banks to the bond market
- Local currency sovereign bond markets have matured
  - EMEs better placed to meet challenges
  - But have not insulated them completely from global conditions

# From banks to bond markets

## US dollar denominated credit to non banks outside the United States<sup>1</sup>

Amounts outstanding, in trillions of US dollars

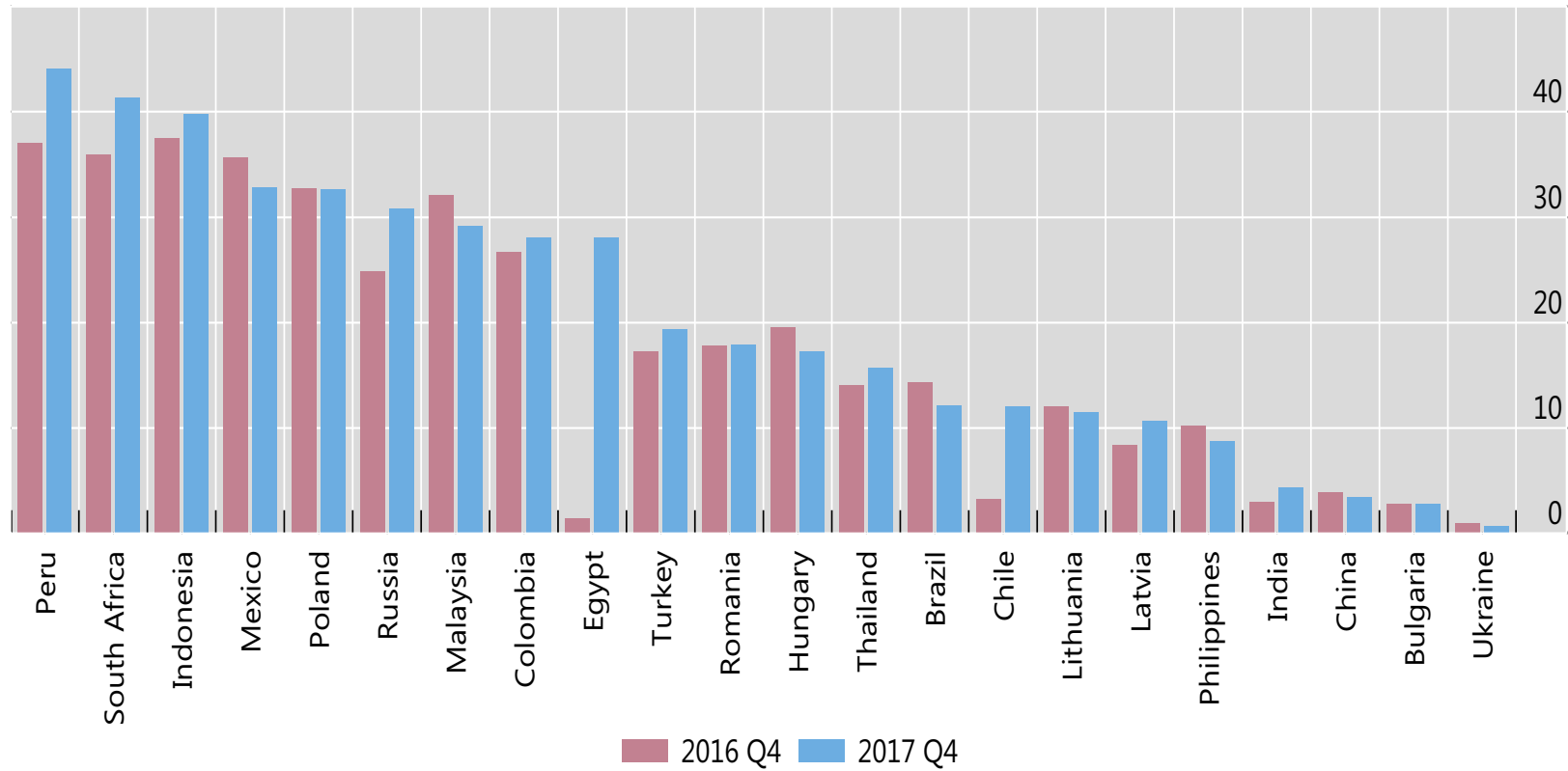


Further information on the BIS global liquidity indicators is available at [www.bis.org/statistics/about\\_gli\\_stats.htm](http://www.bis.org/statistics/about_gli_stats.htm).

<sup>1</sup> Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. <sup>2</sup> Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans.

Source: BIS global liquidity indicators.

## Non-resident holdings of local currency sovereign bonds



Source: World Bank

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## Local currency bonds insulate monetary policy from global conditions only imperfectly

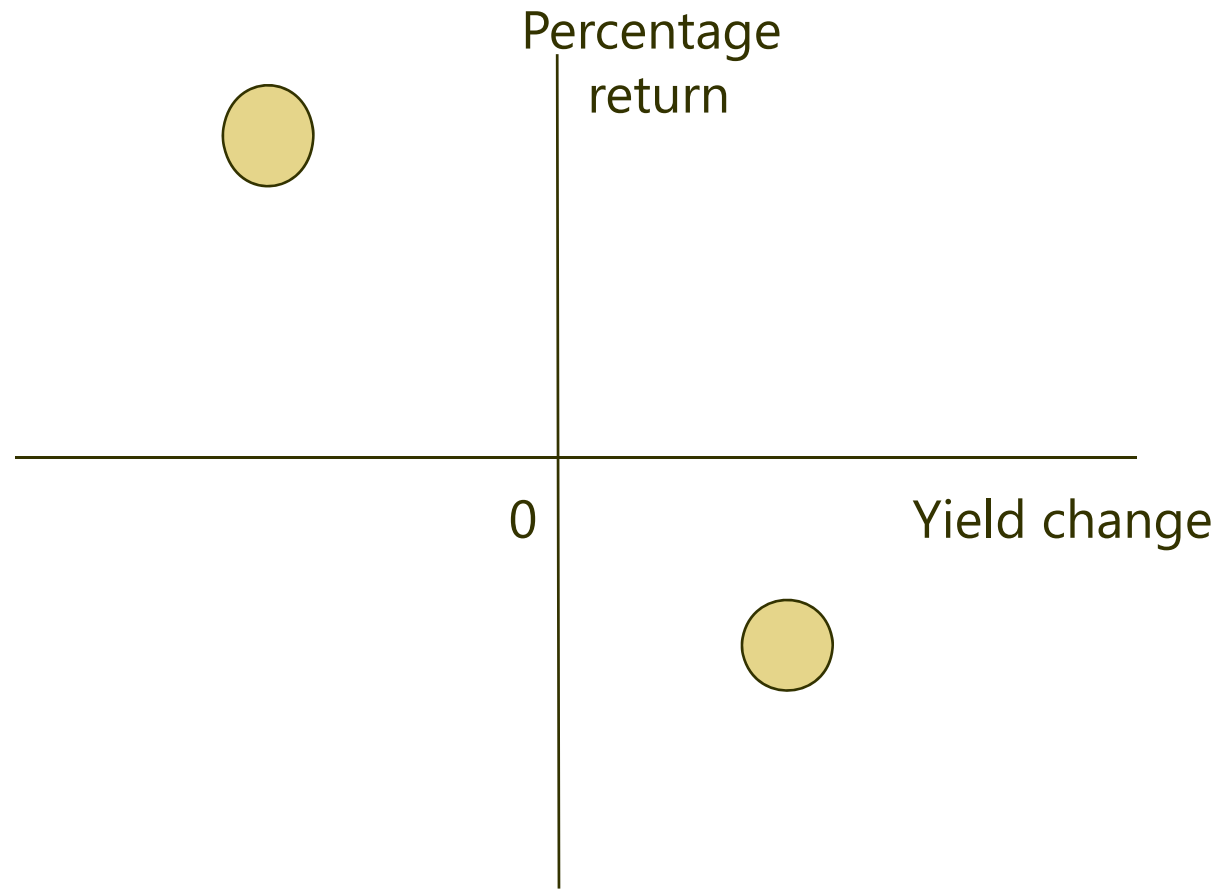
- Inflow phase
  - Currency appreciation
  - Subdued inflation
  - Strong credit-fueled activity
- Outflow phase
  - Currency depreciation
  - Pass-through to inflation
  - Weak activity

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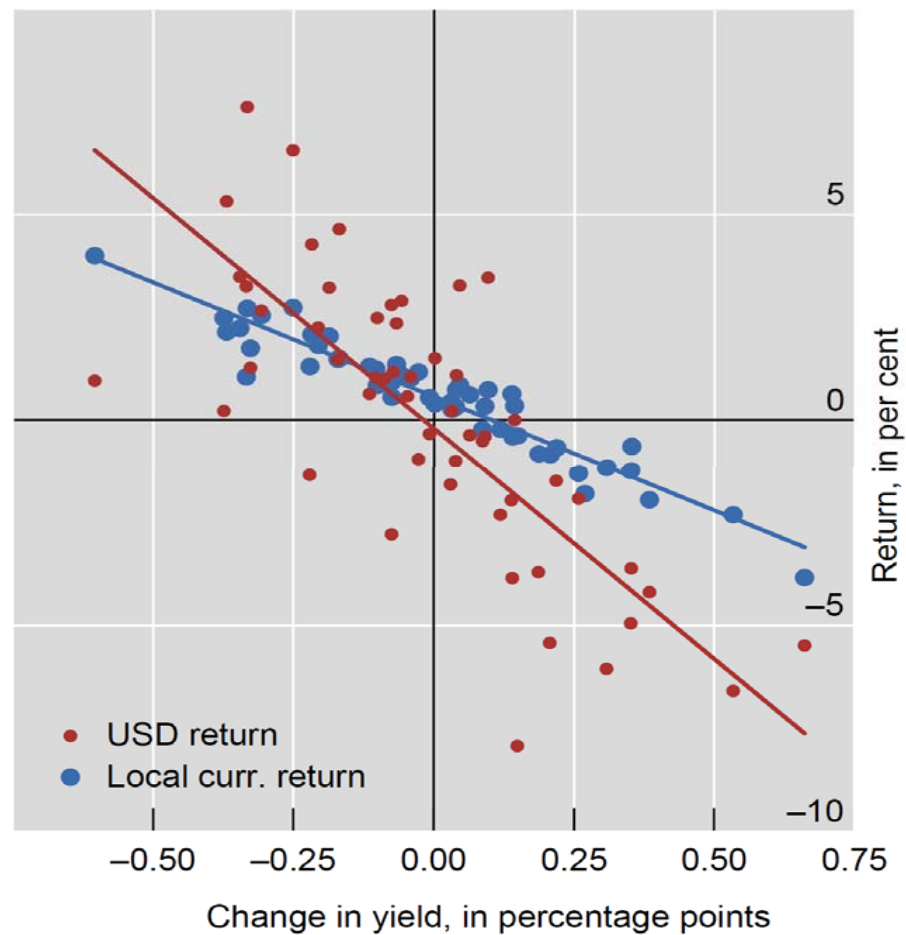
## Two duration measures

$$\text{Duration} = -\frac{dP/P}{dr}$$

- Compare duration measures with:
  - Percentage return in local currency terms
  - Percentage return in dollar terms



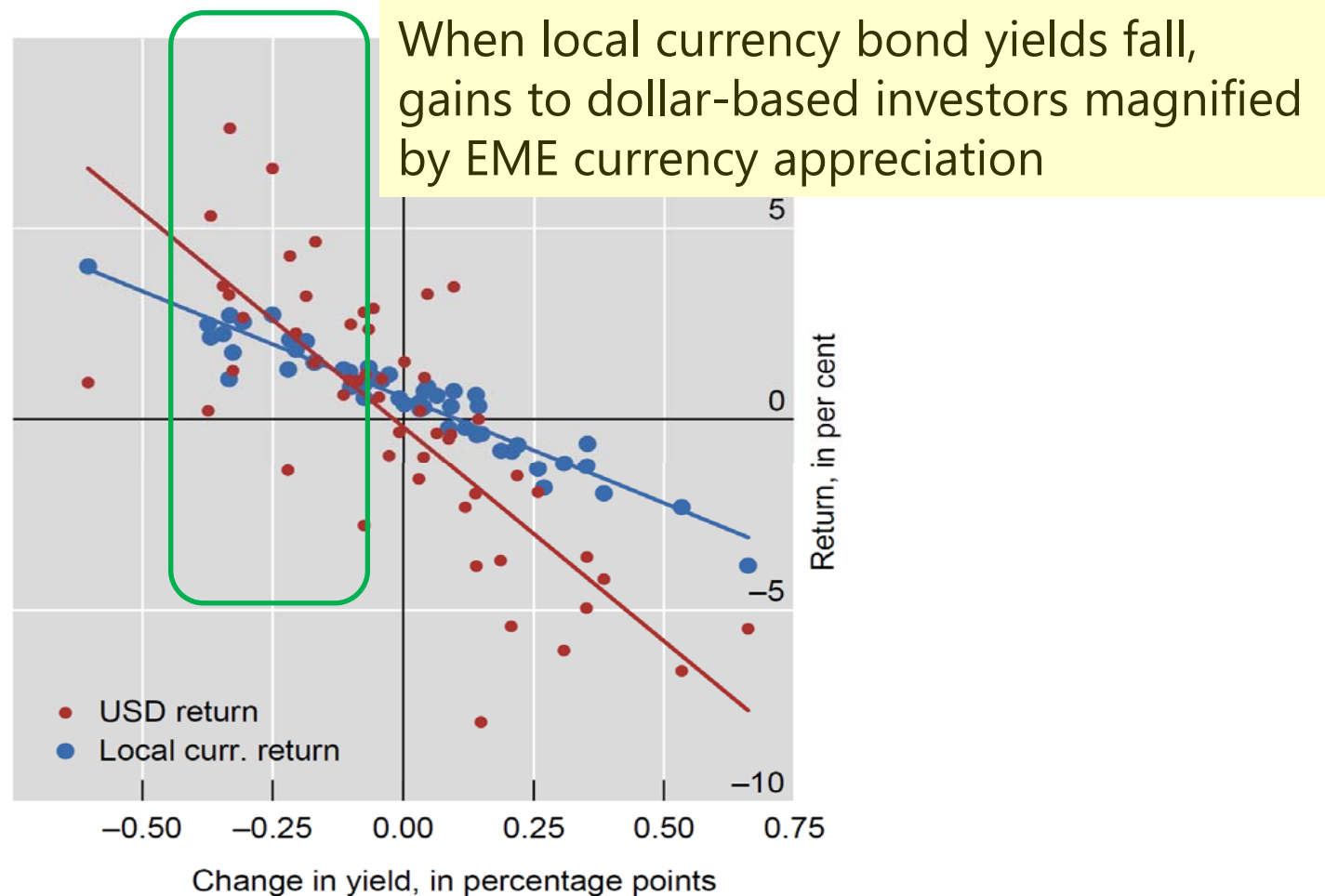
## EME bond fund local currency returns and USD returns



Sources: EPFR; JPMorgan Chase; Hofmann, Shim and Shin (2017)

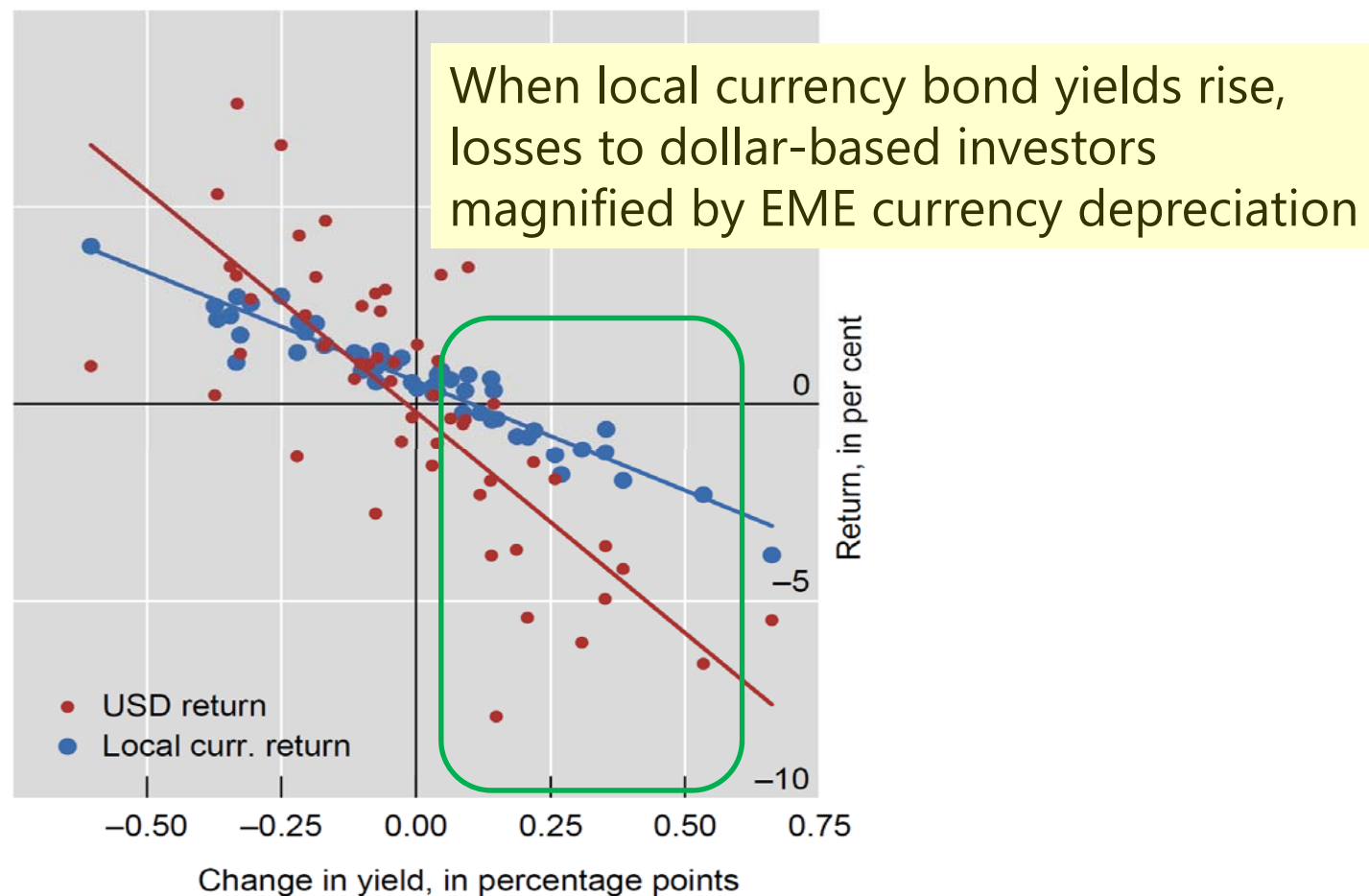


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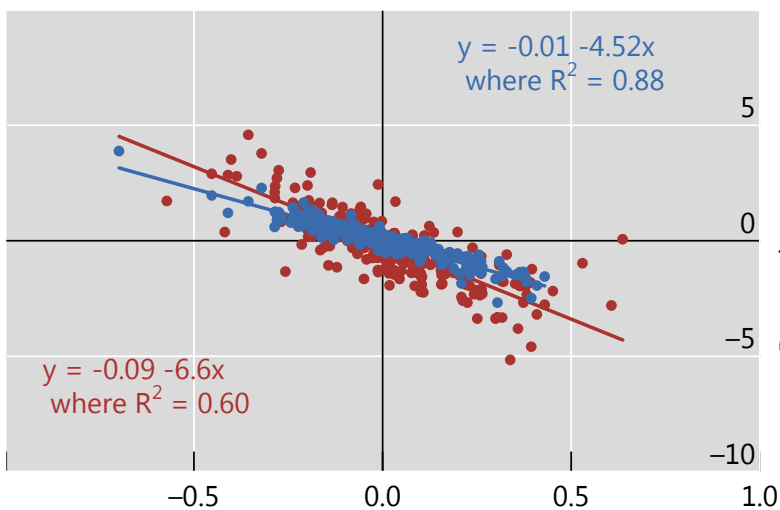
## EME bond fund local currency returns and USD returns



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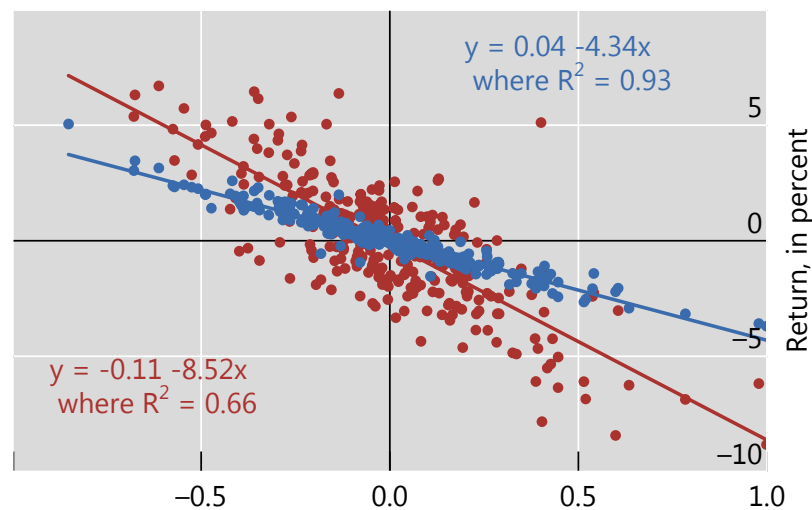
# EMEs local currency sovereign bonds performance<sup>1</sup>, January 2013 – October 2018

Indonesia



• US dollar return

Brazil



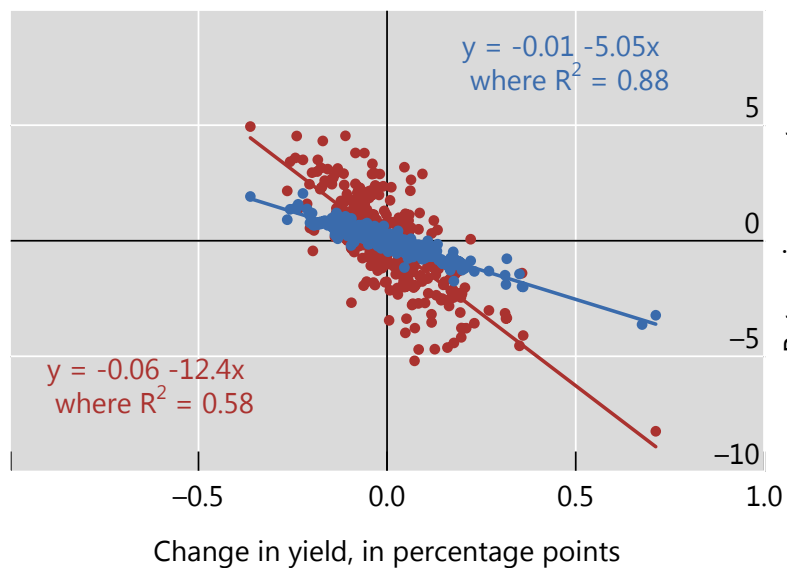
• US dollar return

<sup>1</sup>Total return on bonds denominated in local currency as weekly change in JPMorgan GBI-EM principal return index in local currency and US dollar.

Sources: JPMorgan Chase; BIS calculations.

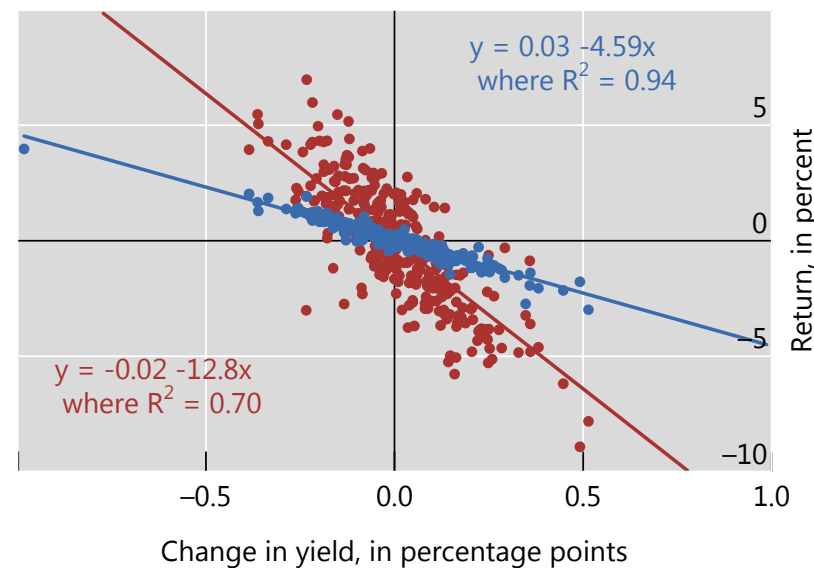
# EMEs local currency sovereign bonds performance<sup>1</sup>, January 2013 – October 2018

Mexico



• Local currency return

South Africa



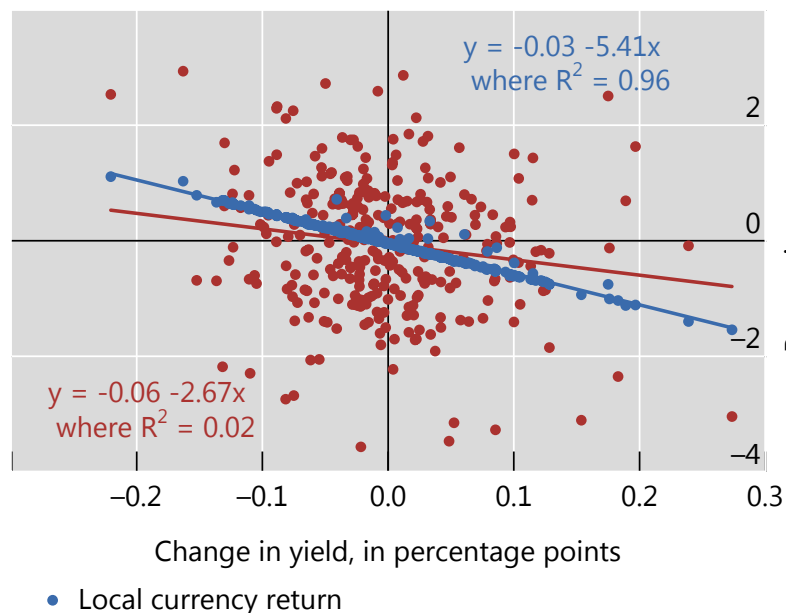
• US dollar return

<sup>1</sup>Total return on bonds denominated in local currency as weekly change in JPMorgan GBI-EM principal return index in local currency and US dollar.

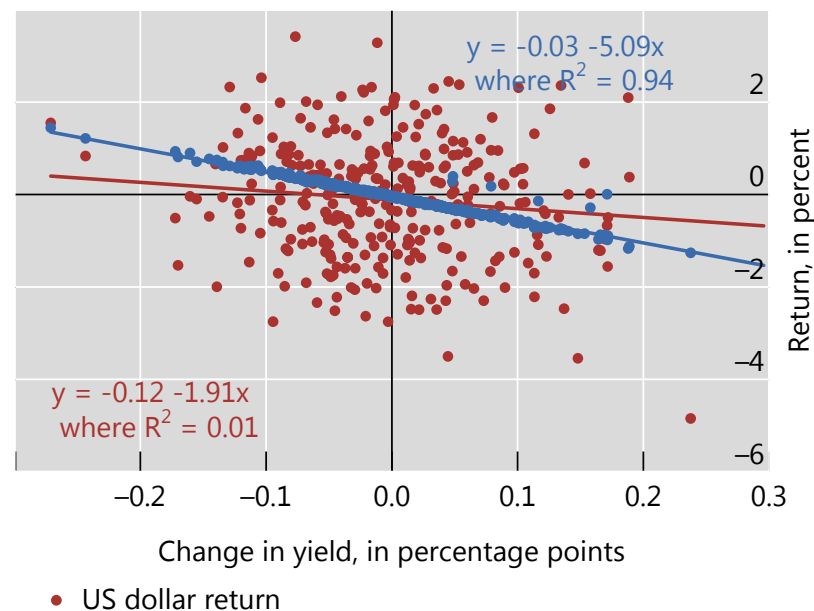
Sources: JPMorgan Chase; BIS calculations.

# Advanced economies sovereign bond indices<sup>1</sup>, January 2013 – October 2018

France



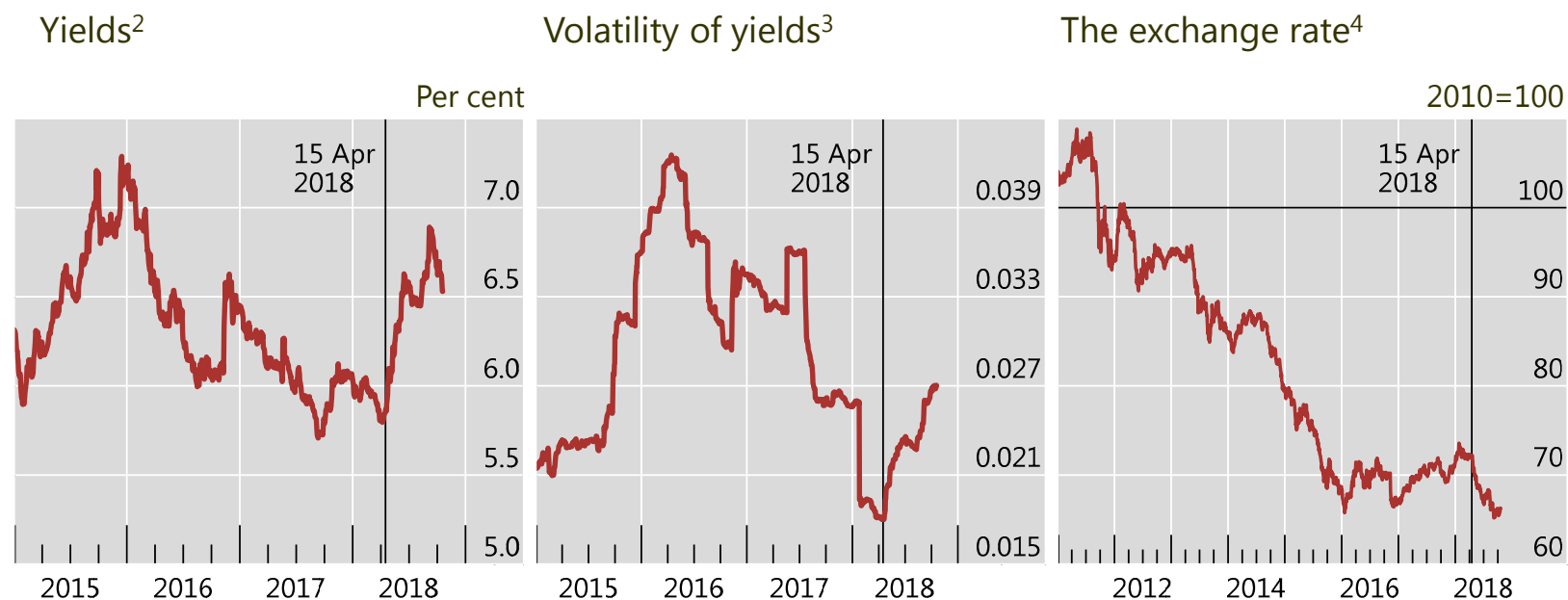
Sweden



<sup>1</sup>GBI Global Country 5 to 7 year maturity indices for the selected economies.

Sources: JPMorgan Chase; BIS calculations.

# Yields of local currency EM government bonds and the exchange rates<sup>1</sup>



<sup>1</sup> All three graphs show the simple average of Brazil, India, Indonesia, Malaysia, Mexico, the Philippines, Poland and South Africa. The black vertical lines correspond to 15 April 2018. <sup>2</sup> Yields on 5-year local currency bonds. <sup>3</sup> 180-day moving standard deviation of daily changes in yields. <sup>4</sup> In dollars per unit of local currency.

Sources: Bloomberg; national data; BIS calculations.

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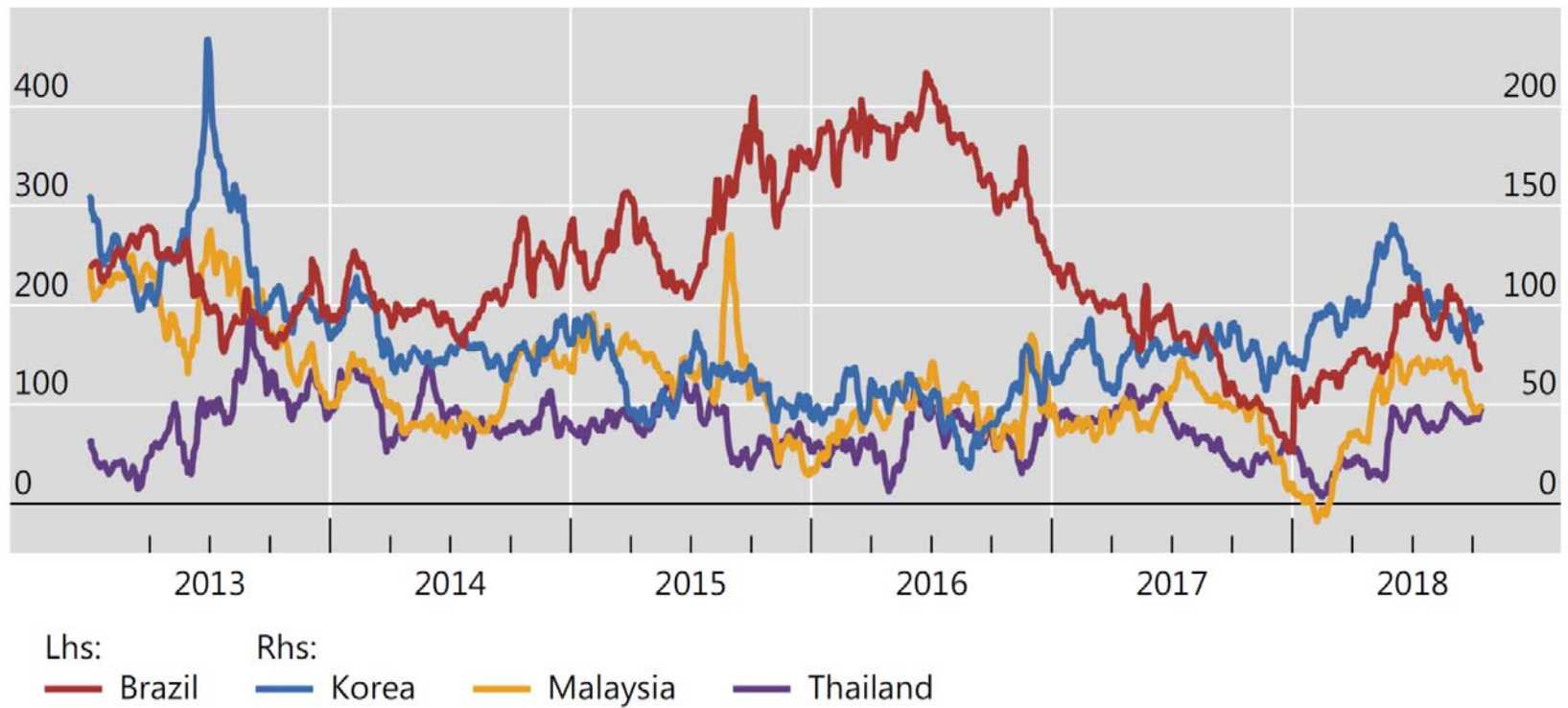
## Du-Schreger spread

- Du and Schreger (JF 2015)
- Consider a dollar-based investor
  - Swap dollars into pesos
  - Invest in peso sovereign bonds

Du-Schreger spread = peso bond yield on swapped basis  
– same maturity US treasury yield

- Du-Schreger spread is risk premium on local currency sovereign bond for a dollar-based investor

## Du-Schreger spreads



Sources: Bloomberg; Du and Schreger (2016).



## Panel regression: Du-Schreger (2015) spread

	(1)	(2)	(3)	(4)	(5)
$\Delta\text{BER}_{t-1}$	-0.015*** [-2.58]			-0.029** [-2.23]	-0.015*** [-2.64]
$\Delta\text{NEER}_{t-1}$		-0.013* [-1.67]		0.019 [1.07]	
Orth $\Delta\text{NEER}_{t-1}$			0.003 [0.20]		0.007 [0.40]
$y_{t-1}$	0.071*** [3.14]	0.081*** [3.06]	0.090*** [2.94]	0.067*** [2.97]	0.071*** [3.10]
$\Delta\text{VIX}_{t-1}$	0.001 [0.98]	0.001 [1.26]	0.002** [2.04]	0.001 [0.94]	0.001 [0.99]
$\Delta\text{CPIUS}_{t-1}$	0.120*** [3.68]	0.094*** [3.50]	0.089** [2.32]	0.140*** [3.23]	0.126*** [3.06]
$\Delta\text{IPUS}_{t-1}$	-0.008 [-0.68]	-0.010 [-0.80]	-0.013 [-1.09]	-0.008 [-0.68]	-0.008 [-0.68]
$\Delta\text{IRUS}_{t-1}$	-0.104* [-1.67]	-0.081 [-1.33]	-0.095 [-1.48]	-0.130** [-2.03]	-0.112* [-1.75]
$\Delta\text{CPI}_{t-1}$	0.021 [0.92]	0.022 [0.96]	0.024 [1.14]	0.021 [0.98]	0.021 [0.92]
$\Delta\text{IP}_{t-1}$	0.004** [2.10]	0.004** [2.10]	0.005** [2.45]	0.004** [2.16]	0.004** [2.10]
$\Delta\text{IR}_{t-1}$	0.028 [0.80]	0.033 [0.94]	0.039 [1.21]	0.027 [0.78]	0.027 [0.80]
N	14	14	14	14	14
N×T	1548	1548	1548	1548	1548
Within R <sup>2</sup>	0.058	0.051	0.044	0.061	0.058

Hofmann, Shim and Shin (2016): monthly data, 14 EMEs

## Panel regression: Cross-currency swap rate

	(1)	(2)	(3)	(4)	(5)
$\Delta\text{BER}_{t-1}$	-0.005 [-0.98]			-0.024* [-1.92]	-0.006 [-1.16]
$\Delta\text{NEER}_{t-1}$		-0.001 [-0.14]		0.025 [1.27]	
Orth $\Delta\text{NEER}_{t-1}$			0.029 [1.41]		0.030 [1.53]
$y_{t-1}$	0.147** [2.32]	0.148** [2.20]	0.156** [2.33]	0.154** [2.25]	0.154** [2.31]
$\Delta\text{VIX}_{t-1}$	-0.000 [-0.06]	0.000 [0.16]	0.000 [0.13]	-0.000 [-0.18]	-0.000 [-0.20]
$\Delta\text{CPIUS}_{t-1}$	0.100* [1.95]	0.088* [1.76]	0.113* [1.68]	0.126* [1.93]	0.129** [2.01]
$\Delta\text{IPUS}_{t-1}$	0.001 [0.05]	-0.001 [-0.04]	-0.002 [-0.11]	0.000 [0.03]	0.000 [0.01]
$\Delta\text{IRUS}_{t-1}$	0.056 [0.88]	0.062 [1.02]	0.034 [0.61]	0.027 [0.50]	0.027 [0.48]
$\Delta\text{CPI}_{t-1}$	0.048 [1.32]	0.049 [1.35]	0.048 [1.22]	0.047 [1.25]	0.047 [1.21]
$\Delta\text{IP}_{t-1}$	-0.002 [-0.63]	-0.002 [-0.61]	-0.002 [-0.57]	-0.002 [-0.62]	-0.002 [-0.61]
$\Delta\text{IR}_{t-1}$	-0.006 [-0.16]	-0.003 [-0.07]	-0.009 [-0.19]	-0.011 [-0.27]	-0.013 [-0.32]
N	14	14	14	14	14
N×T	1587	1587	1587	1587	1587
Within R <sup>2</sup>	0.033	0.032	0.035	0.036	0.037



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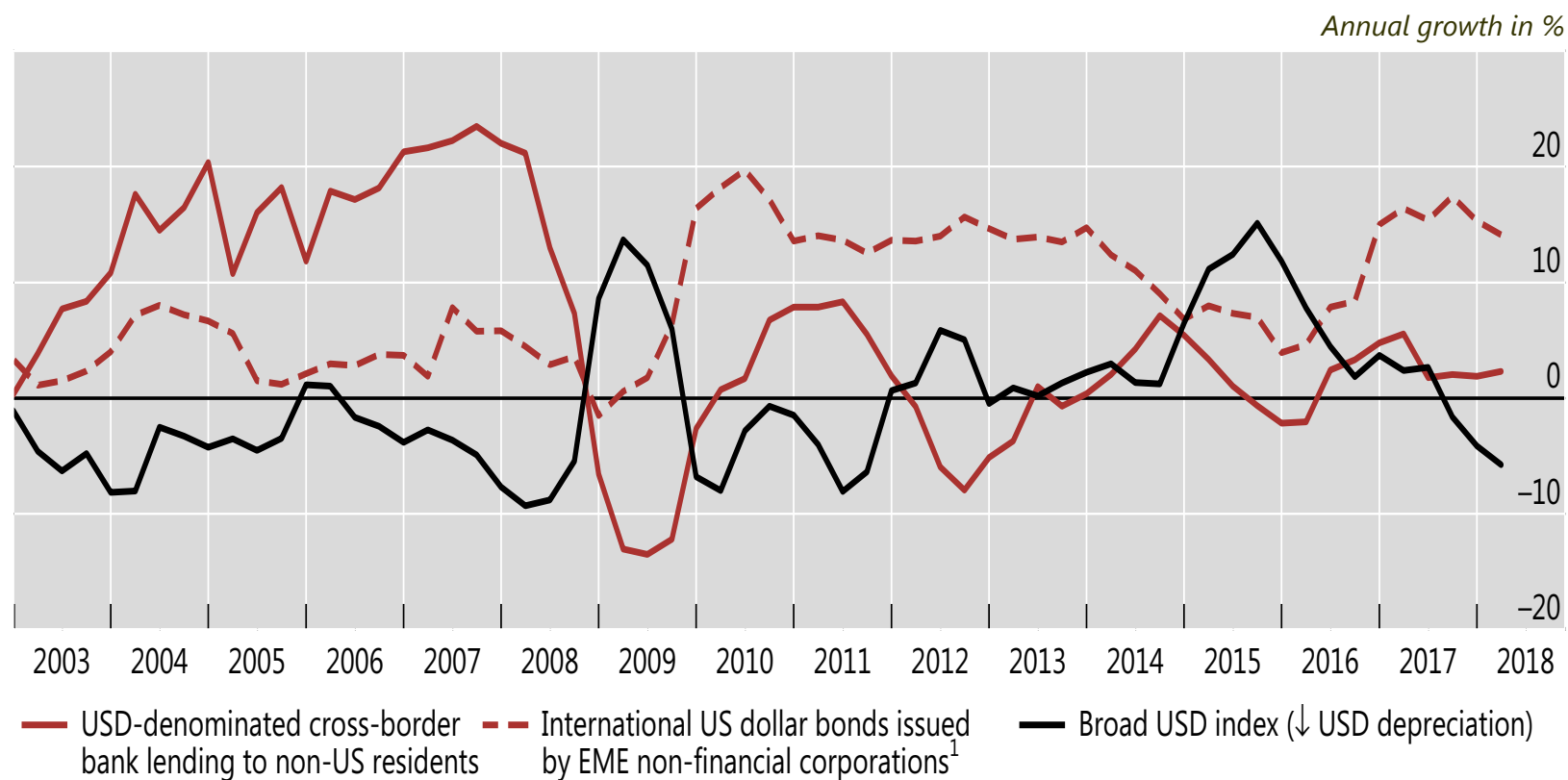
## Exchange rates and credit conditions

- Conventionally, exchange rates enter through
  - Exchange rate pass-through to inflation
  - Net exports
- Financial channel of exchange rates
  - Operates through financial intermediaries
  - Appreciation loosens domestic credit conditions

## Risk-taking channel through credit supply

- Consider global lender with diversified portfolio of dollar credits to borrowers around the world
- Some borrowers face currency mismatch or otherwise benefit from weaker dollar (eg, oil firm)
- Dollar depreciation against whole basket implies:
  - Reduction in credit risk for individual borrowers (fall in  $\varepsilon$ )
  - Reduced tail risk for diversified loan portfolio
  - Reduced Value-at-Risk
  - Increased lending capacity given economic capital
- Broad dollar is proxy for [dollar-debt weighted index of the dollar exchange rate](#).

## Annual growth rates of dollar loans and bonds together with broad USD index



Source: BIS locational banking statistics and nominal effective exchange rate indices.

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## Macroprudential features of FX intervention

- Hofmann, Shin, Villamizar-Villegas (2018)
  - Stylised model analysing how sterilised FXI affects domestic credit
  - Empirical analysis using unique high-frequency data for Colombia
  
- Recent literature on FX intervention
  - Ghosh, Ostry and Qureshi (2017), Blanchard, Adler and Carvalho Filho (2015), Barbone Gonzalez, Khametshin, Peydro and Polo (2018)

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## Hofmann, Shin, Villamizar-Villegas (2018): Model

- Banks lend to local corporates and invest in local currency bonds; local corporates have dollar liabilities
  - Exchange rate depreciation increases default risk and lowers lending to corporates
  - Increase in the stock of local currency bonds crowds out lending to corporates
- Sterilised FX purchases dampen the impact of capital inflows
  - Lean against currency appreciation (intervention leg)
  - Absorb capital inflows (sterilisation leg)
  - Effects are mutually reinforcing

## Hofmann, Shin, Villamizar-Villegas (2018): Empirical analysis

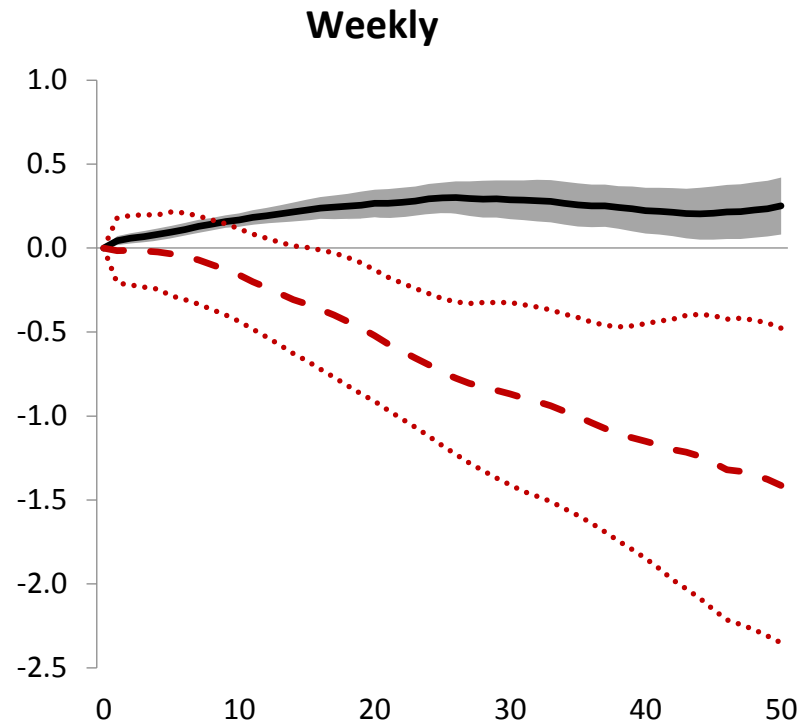
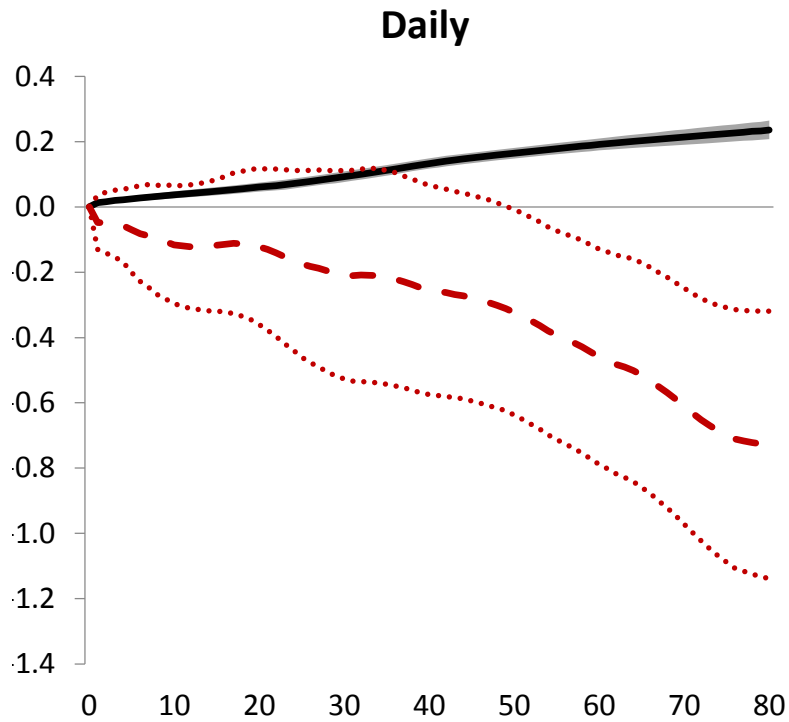
- Time series and panel analysis in daily and weekly frequency using a unique high-frequency database for Colombia
- Local linear projection approach

$$y_{t+h} = \alpha + \lambda y_{t-1} + \beta FXI_{t-1} + \gamma NCI_{t-1} + \Gamma Z_{t-1} + \varepsilon_{t+h}$$

- For identification
  - Include large number of macro and bank controls
  - Focus on period of discretionary FX interventions (2001-2010)
    - Results are similar but weaker over the full sample



# Impact of FXI on new corporate loans

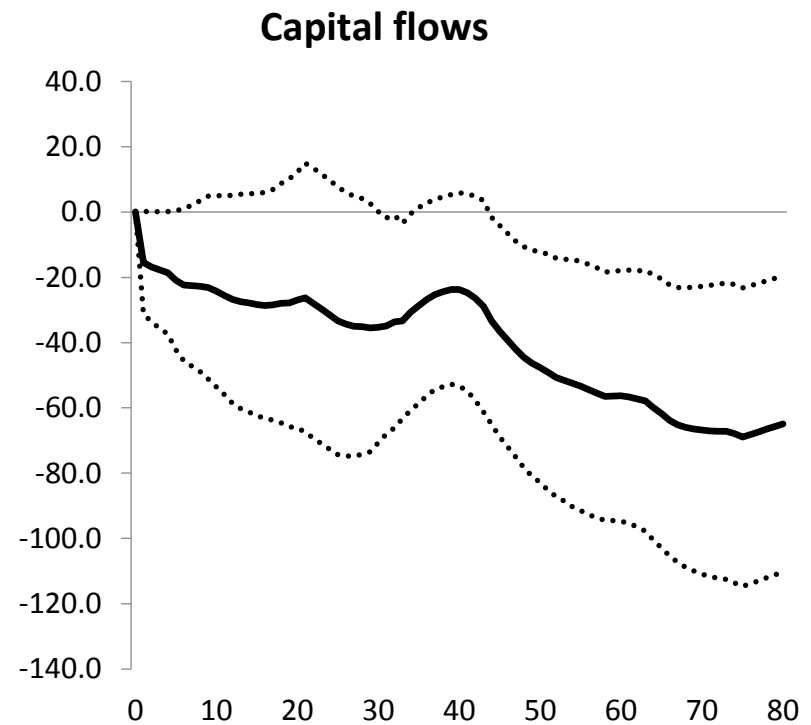
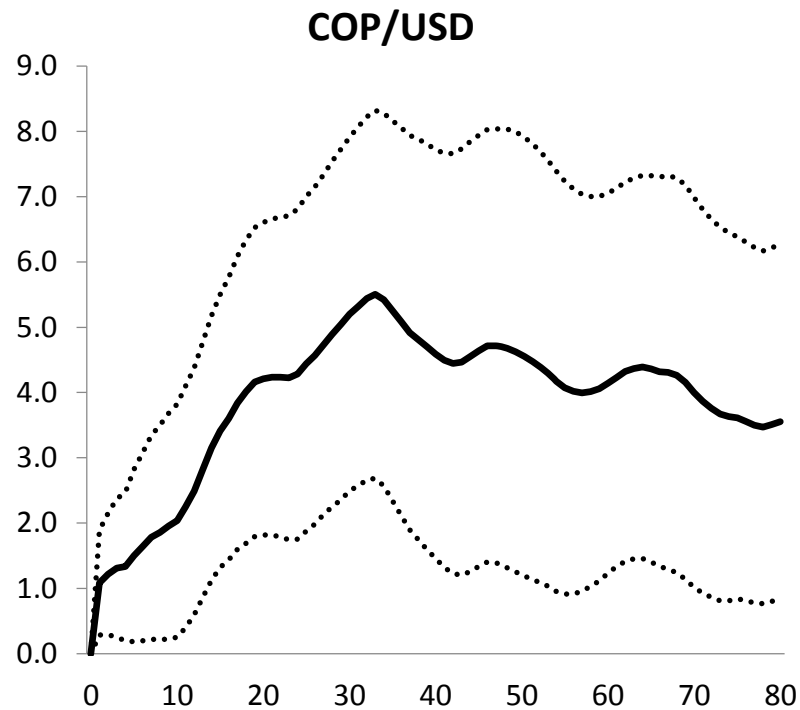


 **Sterilised FX intervention**

 **Capital inflows**

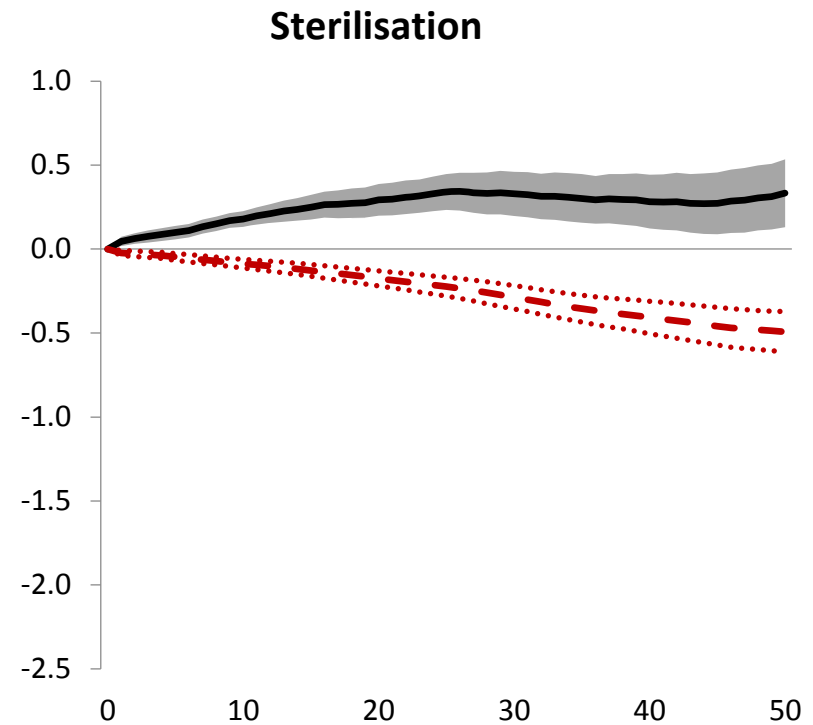
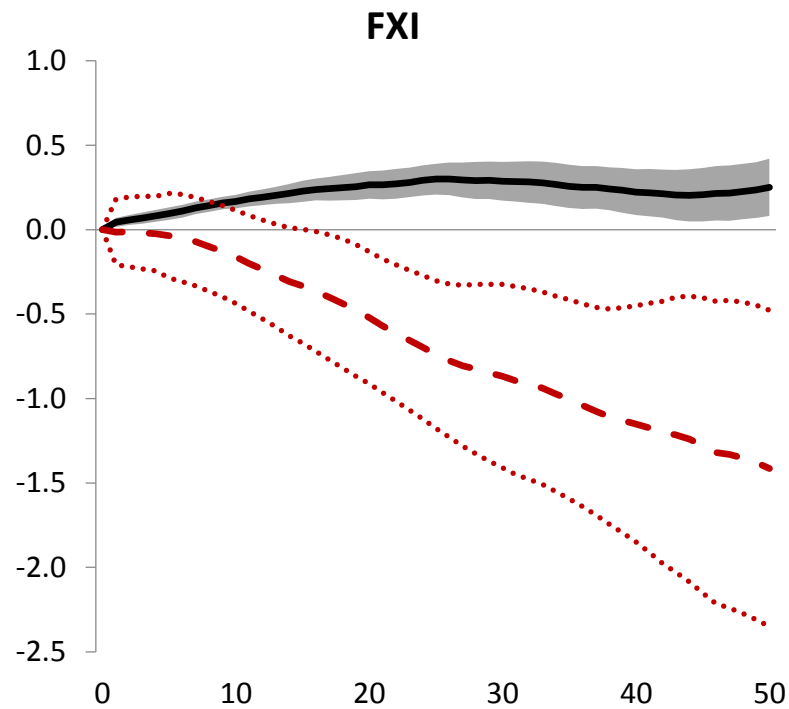
Size of impulse normalised to 100 million USD

# Impact of FXI on exchange rate and capital flows (daily)



Size of impulse normalised to 100 million USD

# Impact of sterilisation operation on new corporate loans (weekly)

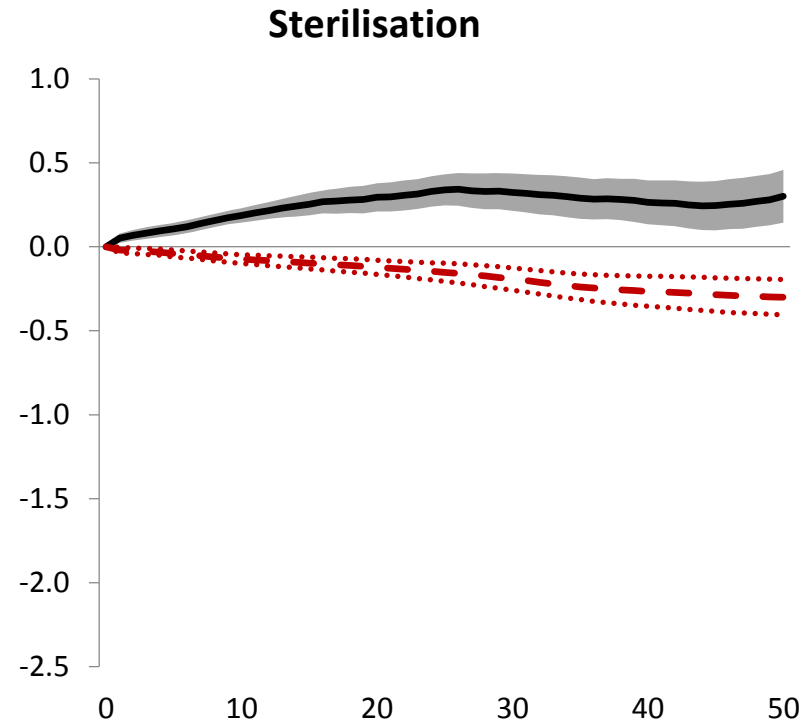
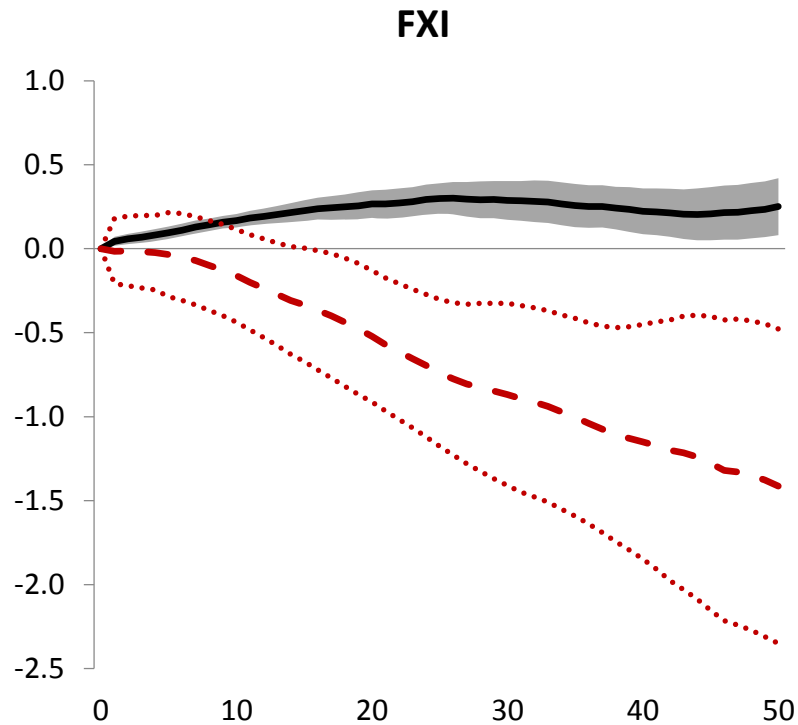


 **FXI/Sterilisation operation**

 **Capital inflows**

Size of impulse normalised to 100 million USD

# Impact of sterilisation operation on new corporate loans excl. intervention periods (weekly)

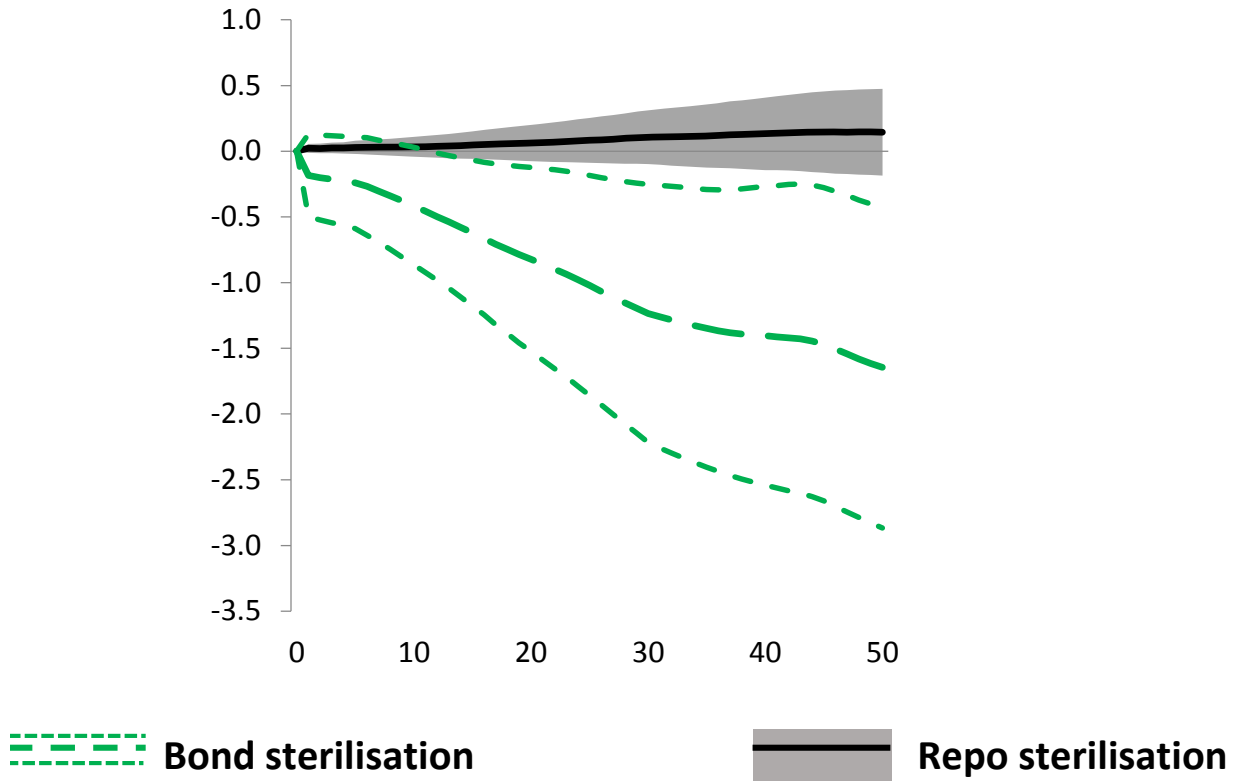


 **FXI/Sterilisation operation**

 **Capital inflows**

Size of impulse normalised to 100 million USD

# Impact of bond and repo sterilisation operations on new corporate loans



Size of impulse normalised to 100 million USD

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## Panel analysis

- Corroborates results of the time series analysis
- Shows that vulnerable banks (high provisions, low capitalisation, small size, high debt) reduce lending more strongly in response to sterilised FXI
  - “Bank lending channel” of FX intervention

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## How far can reserve accumulation help?

- Reserve accumulation has prudential element
  - Cools credit growth beyond “crowding out” effect (Hofmann, Shin and Villamizar (2018))
  - Add degree of freedom to monetary policy
- Relative merits by comparison to GFSN turns on effectiveness of “leaning” versus “cleaning”
- Main challenge is to distinguish from “beggar thy neighbour” currency depreciation for trade competitiveness
  - Distinguish transitory from on-going intervention?
  - Spillovers can be beneficial if financial channel is the relevant margin

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## Institutional development and monetary policy

- Change in pattern of dollar intermediation swaps run risk for duration risk
- Local currency sovereign bond markets gives some insulation from global conditions but not completely
- Institutional development to cushion the impact of currency moves
  - Investor base whose performance is evaluated in local currency terms
  - Currency of performance criterion (USD or LCY) matters