



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.



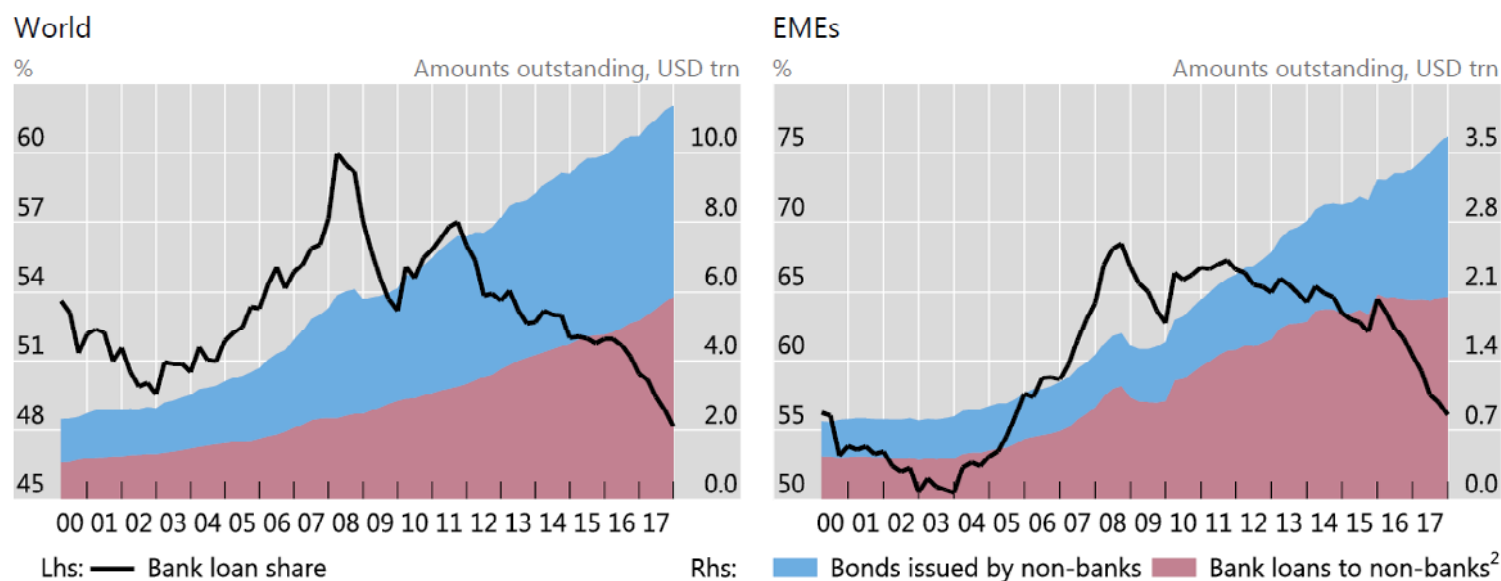
Two structural developments since 1990s EME crises

- 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 States¹

Amounts outstanding, in trillions of US dollars

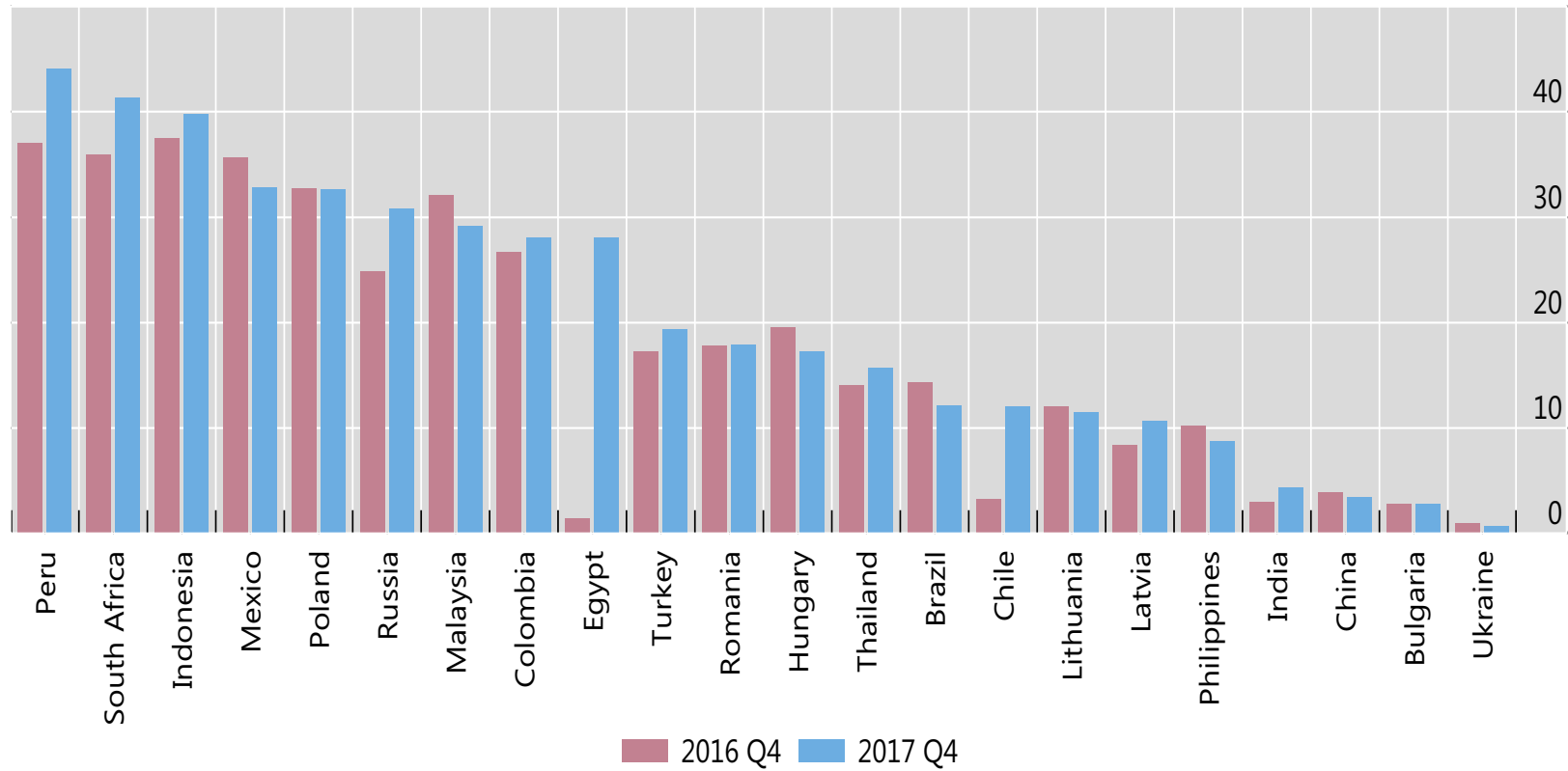


Further information on the BIS global liquidity indicators is available at www.bis.org/statistics/about_gli_stats.htm.

¹ Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. ² 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

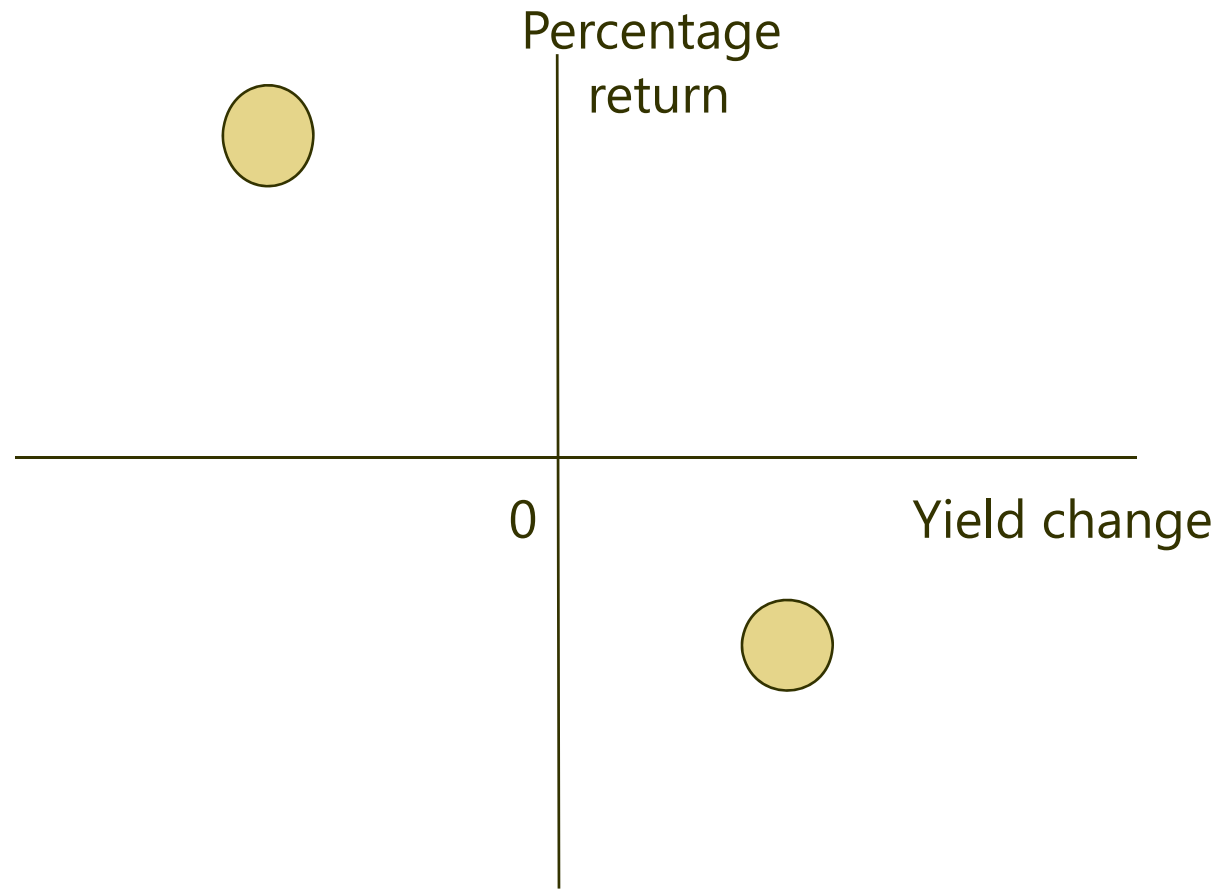
Local currency bonds insulate monetary policy from global conditions only imperfectly

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

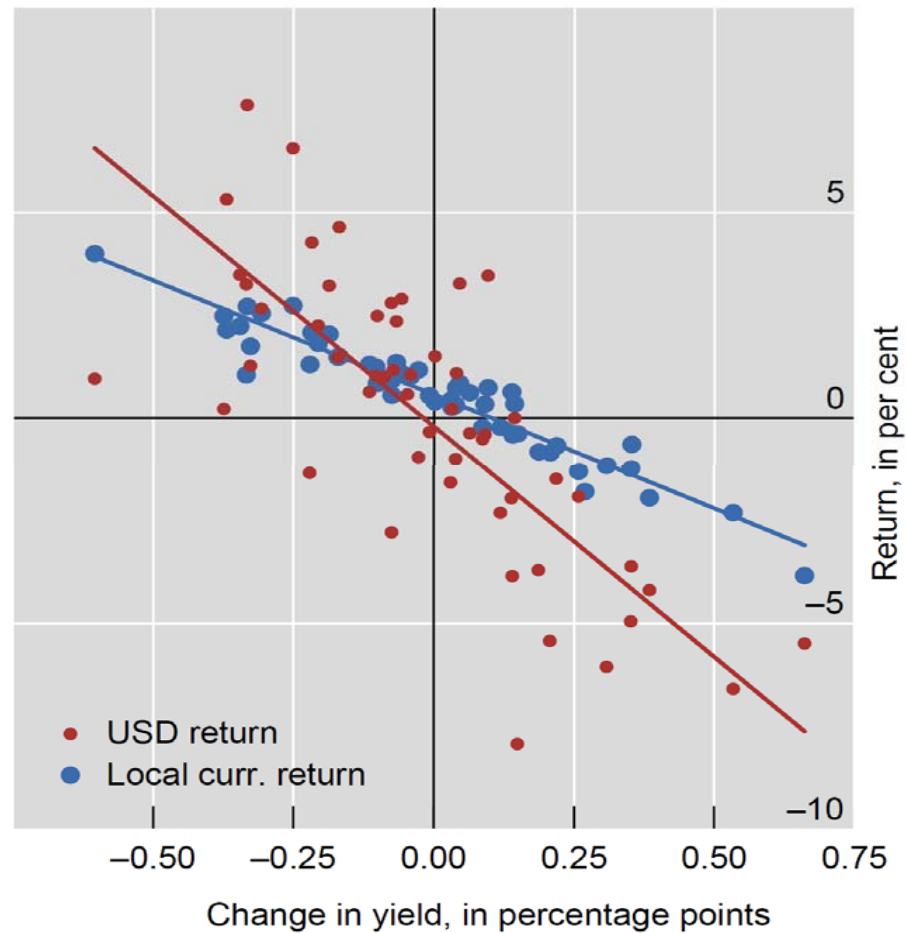
Two duration measures

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

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

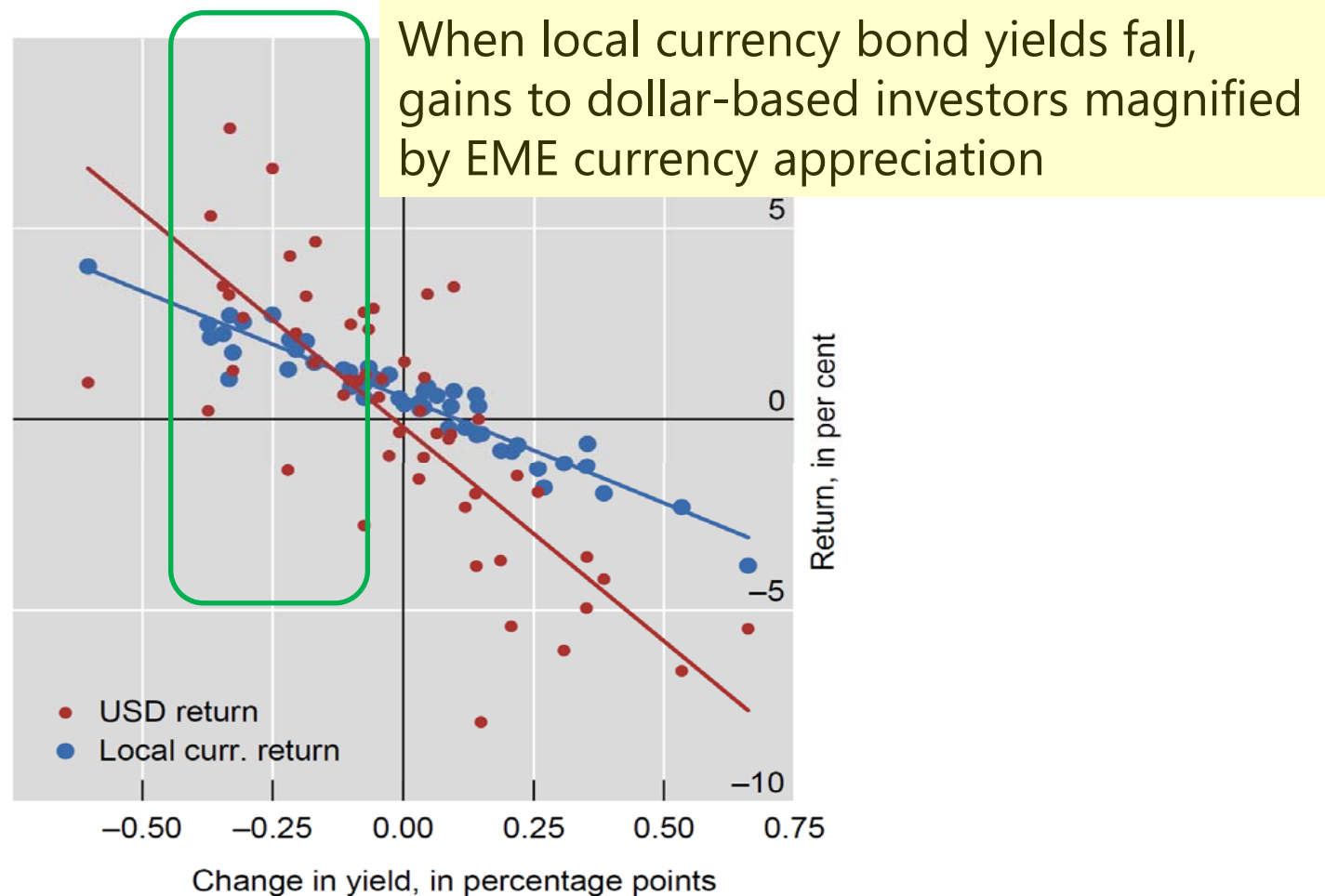


EME bond fund local currency returns and USD returns



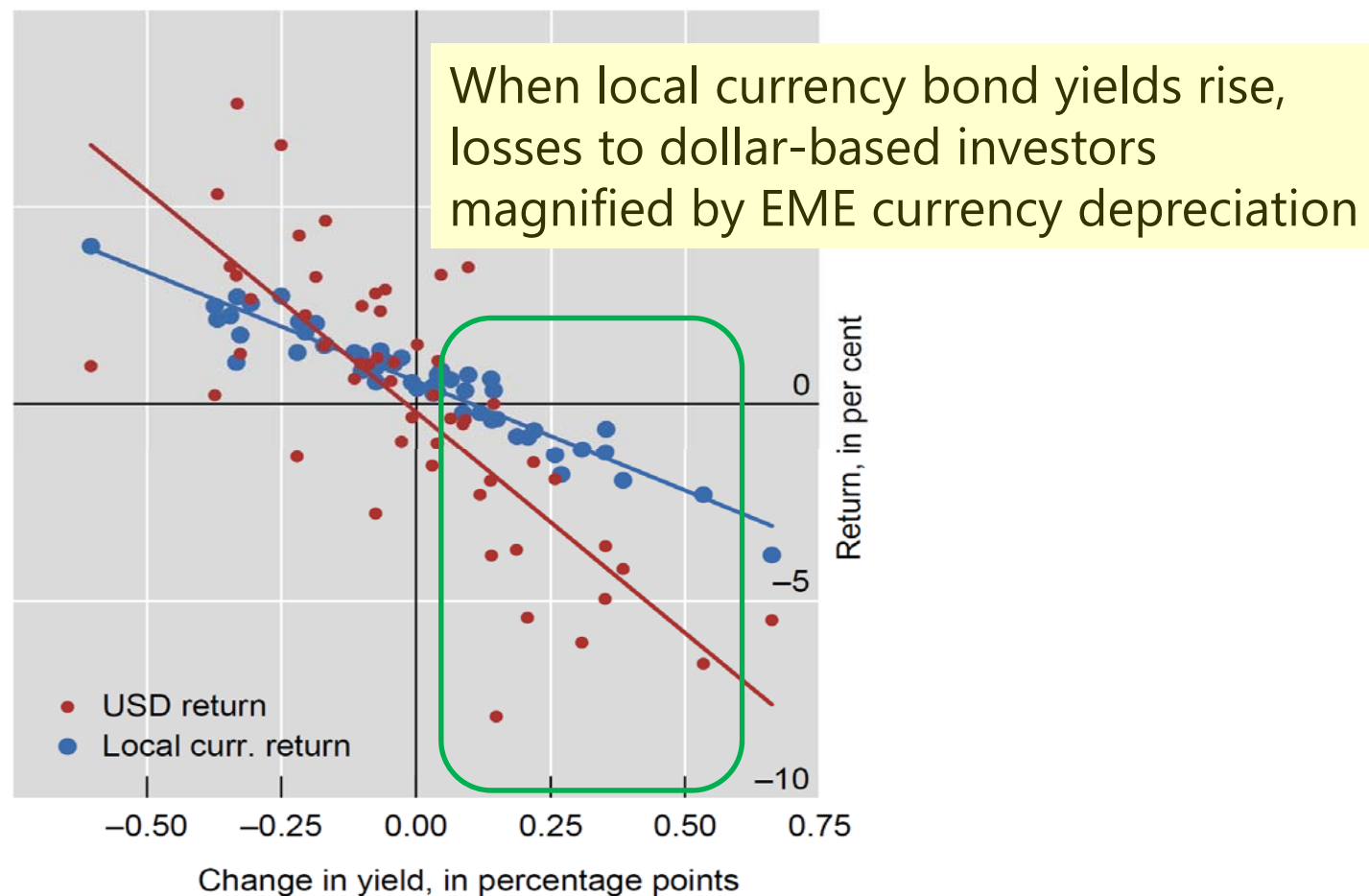
Sources: EPFR; JPMorgan Chase; Hofmann, Shim and Shin (2017)

EME bond fund local currency returns and USD returns



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

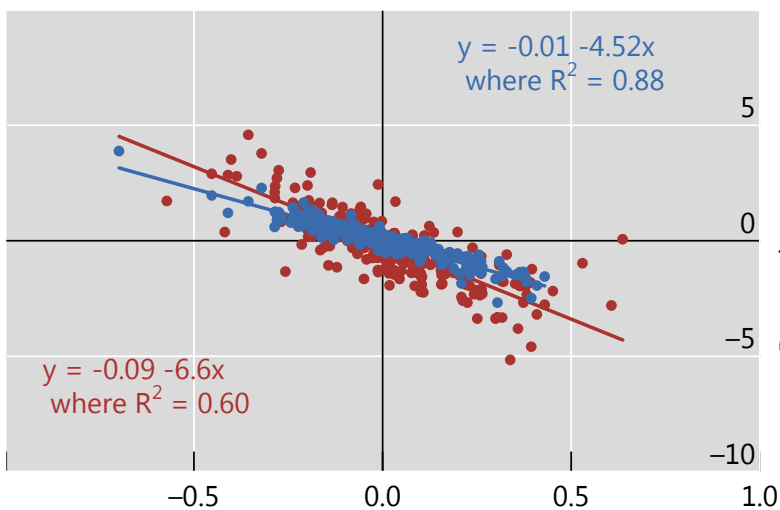
EME bond fund local currency returns and USD returns



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

EMEs local currency sovereign bonds performance¹, January 2013 – October 2018

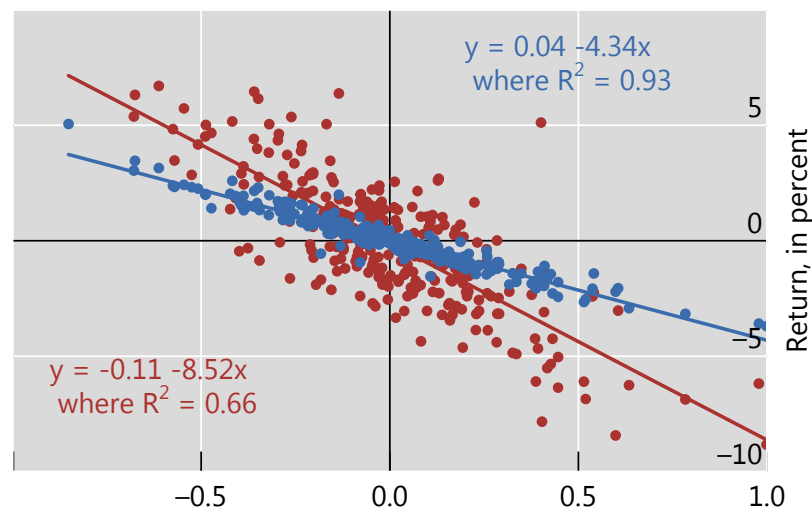
Indonesia



Change in yield, in percentage points

• US dollar return

Brazil



Change in yield, in percentage points

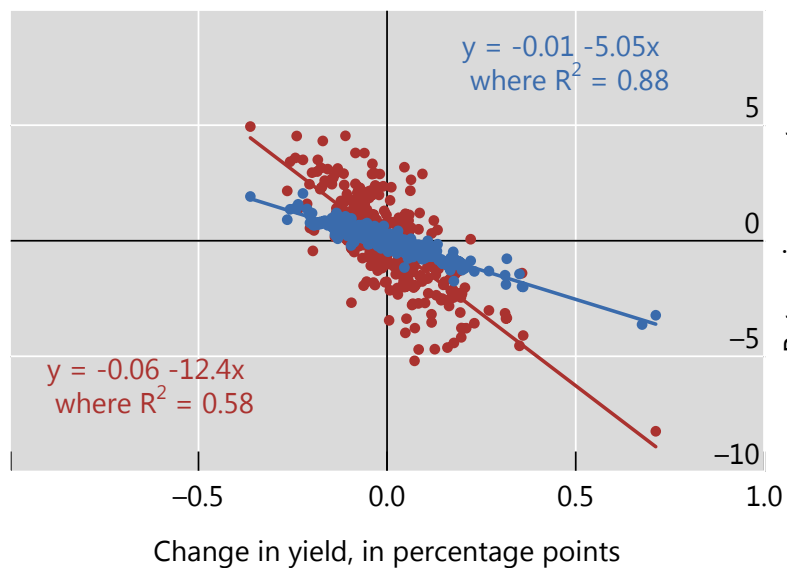
• US dollar return

¹Total 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.

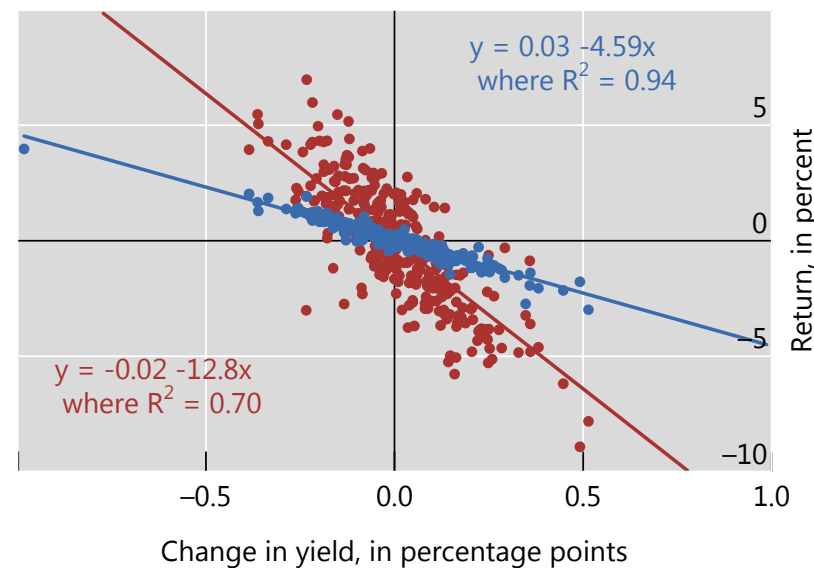
EMEs local currency sovereign bonds performance¹, January 2013 – October 2018

Mexico



• Local currency return

South Africa



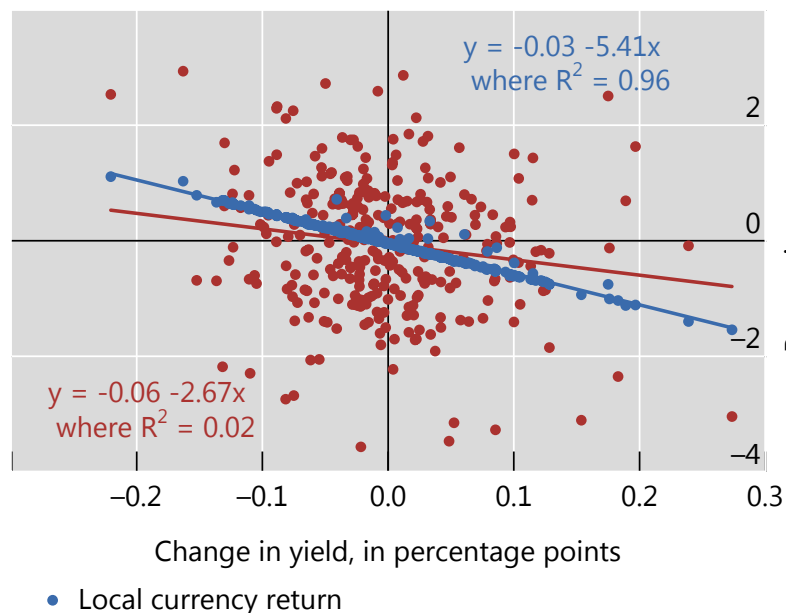
• US dollar return

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

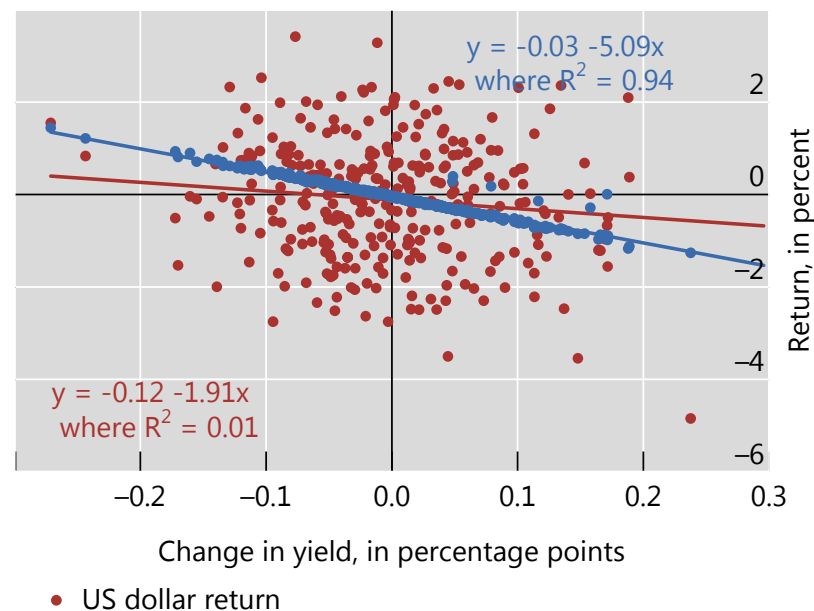
Sources: JPMorgan Chase; BIS calculations.

Advanced economies sovereign bond indices¹, January 2013 – October 2018

France



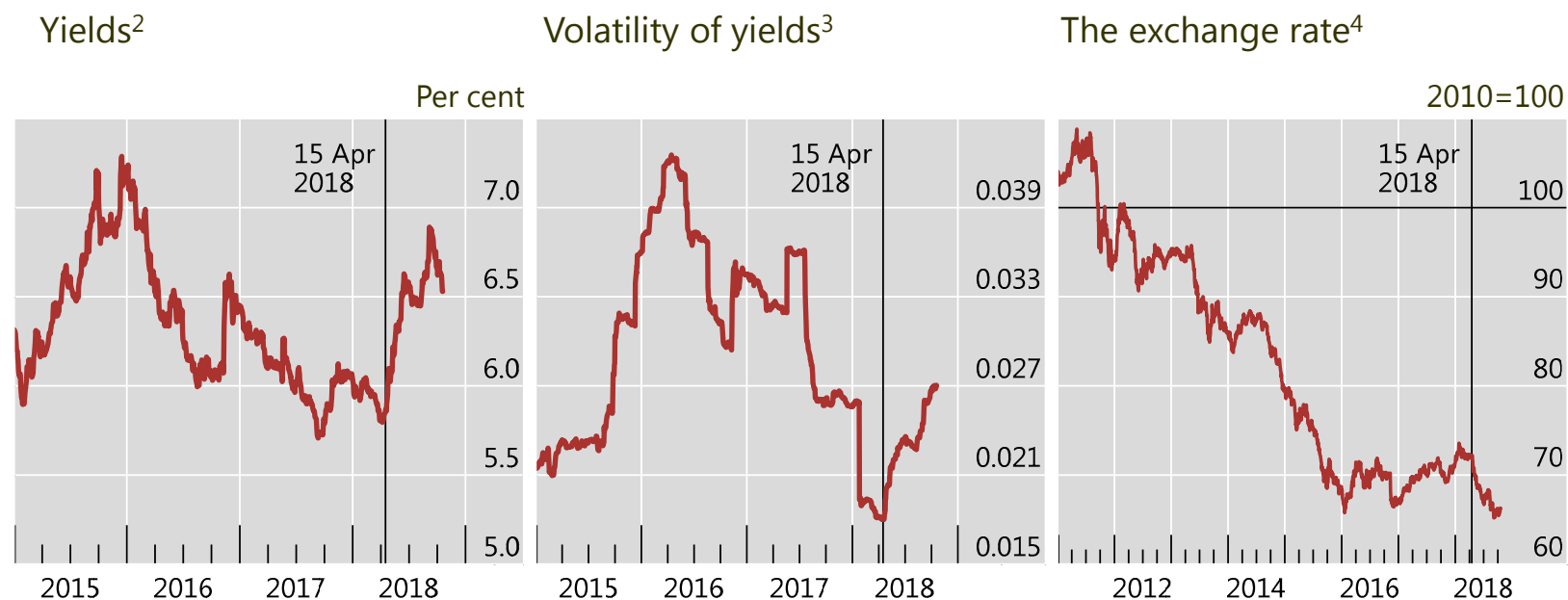
Sweden



¹GBI 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 rates¹



¹ 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. ² Yields on 5-year local currency bonds. ³ 180-day moving standard deviation of daily changes in yields. ⁴ In dollars per unit of local currency.

Sources: Bloomberg; national data; BIS calculations.

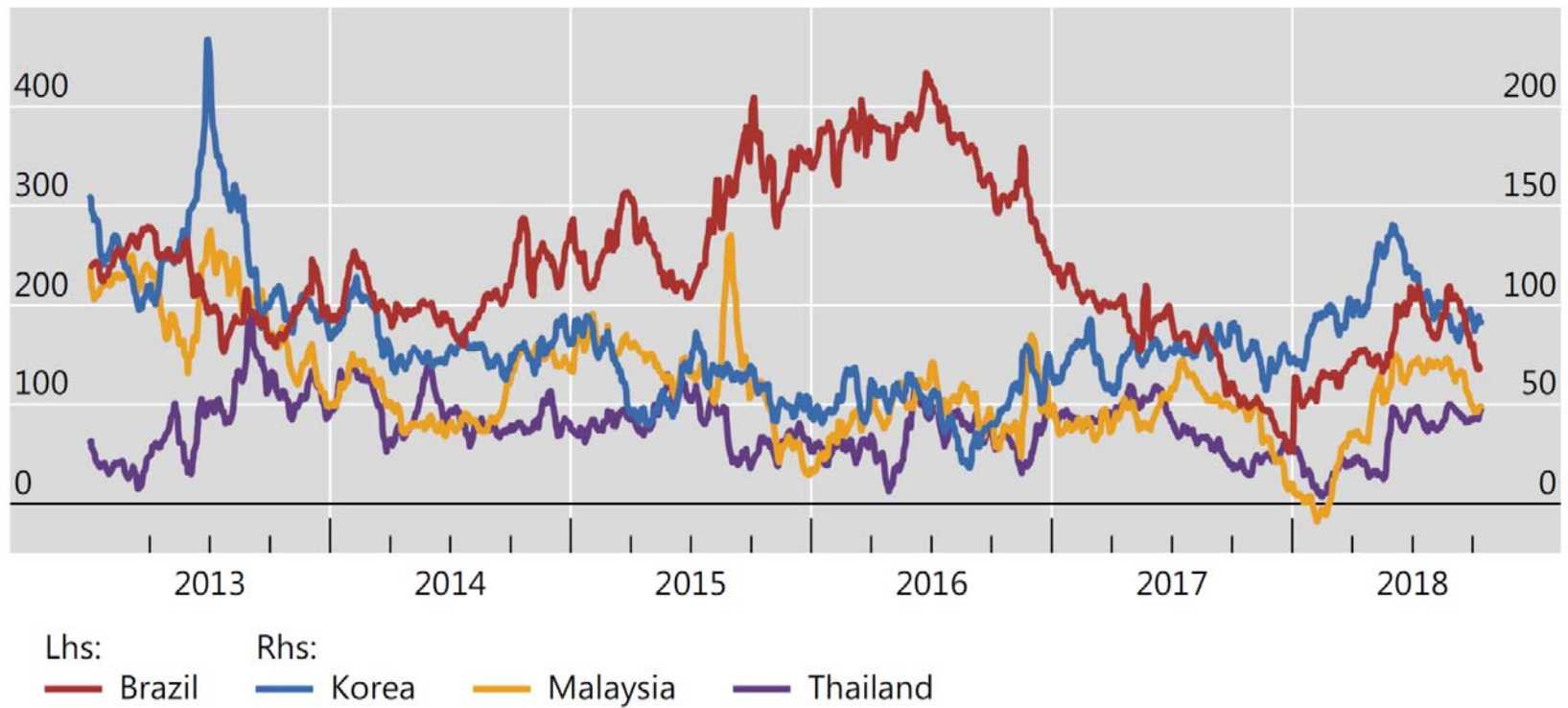
Du-Schreger spread

- 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)
ΔBER_{t-1}	-0.015*** [-2.58]			-0.029** [-2.23]	-0.015*** [-2.64]
ΔNEER_{t-1}		-0.013* [-1.67]		0.019 [1.07]	
Orth ΔNEER_{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]
ΔVIX_{t-1}	0.001 [0.98]	0.001 [1.26]	0.002** [2.04]	0.001 [0.94]	0.001 [0.99]
ΔCPIUS_{t-1}	0.120*** [3.68]	0.094*** [3.50]	0.089** [2.32]	0.140*** [3.23]	0.126*** [3.06]
ΔIPUS_{t-1}	-0.008 [-0.68]	-0.010 [-0.80]	-0.013 [-1.09]	-0.008 [-0.68]	-0.008 [-0.68]
ΔIRUS_{t-1}	-0.104* [-1.67]	-0.081 [-1.33]	-0.095 [-1.48]	-0.130** [-2.03]	-0.112* [-1.75]
ΔCPI_{t-1}	0.021 [0.92]	0.022 [0.96]	0.024 [1.14]	0.021 [0.98]	0.021 [0.92]
ΔIP_{t-1}	0.004** [2.10]	0.004** [2.10]	0.005** [2.45]	0.004** [2.16]	0.004** [2.10]
ΔIR_{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 ²	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)
ΔBER_{t-1}	-0.005 [-0.98]			-0.024* [-1.92]	-0.006 [-1.16]
ΔNEER_{t-1}		-0.001 [-0.14]		0.025 [1.27]	
Orth ΔNEER_{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]
ΔVIX_{t-1}	-0.000 [-0.06]	0.000 [0.16]	0.000 [0.13]	-0.000 [-0.18]	-0.000 [-0.20]
ΔCPIUS_{t-1}	0.100* [1.95]	0.088* [1.76]	0.113* [1.68]	0.126* [1.93]	0.129** [2.01]
ΔIPUS_{t-1}	0.001 [0.05]	-0.001 [-0.04]	-0.002 [-0.11]	0.000 [0.03]	0.000 [0.01]
ΔIRUS_{t-1}	0.056 [0.88]	0.062 [1.02]	0.034 [0.61]	0.027 [0.50]	0.027 [0.48]
ΔCPI_{t-1}	0.048 [1.32]	0.049 [1.35]	0.048 [1.22]	0.047 [1.25]	0.047 [1.21]
ΔIP_{t-1}	-0.002 [-0.63]	-0.002 [-0.61]	-0.002 [-0.57]	-0.002 [-0.62]	-0.002 [-0.61]
ΔIR_{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 ²	0.033	0.032	0.035	0.036	0.037



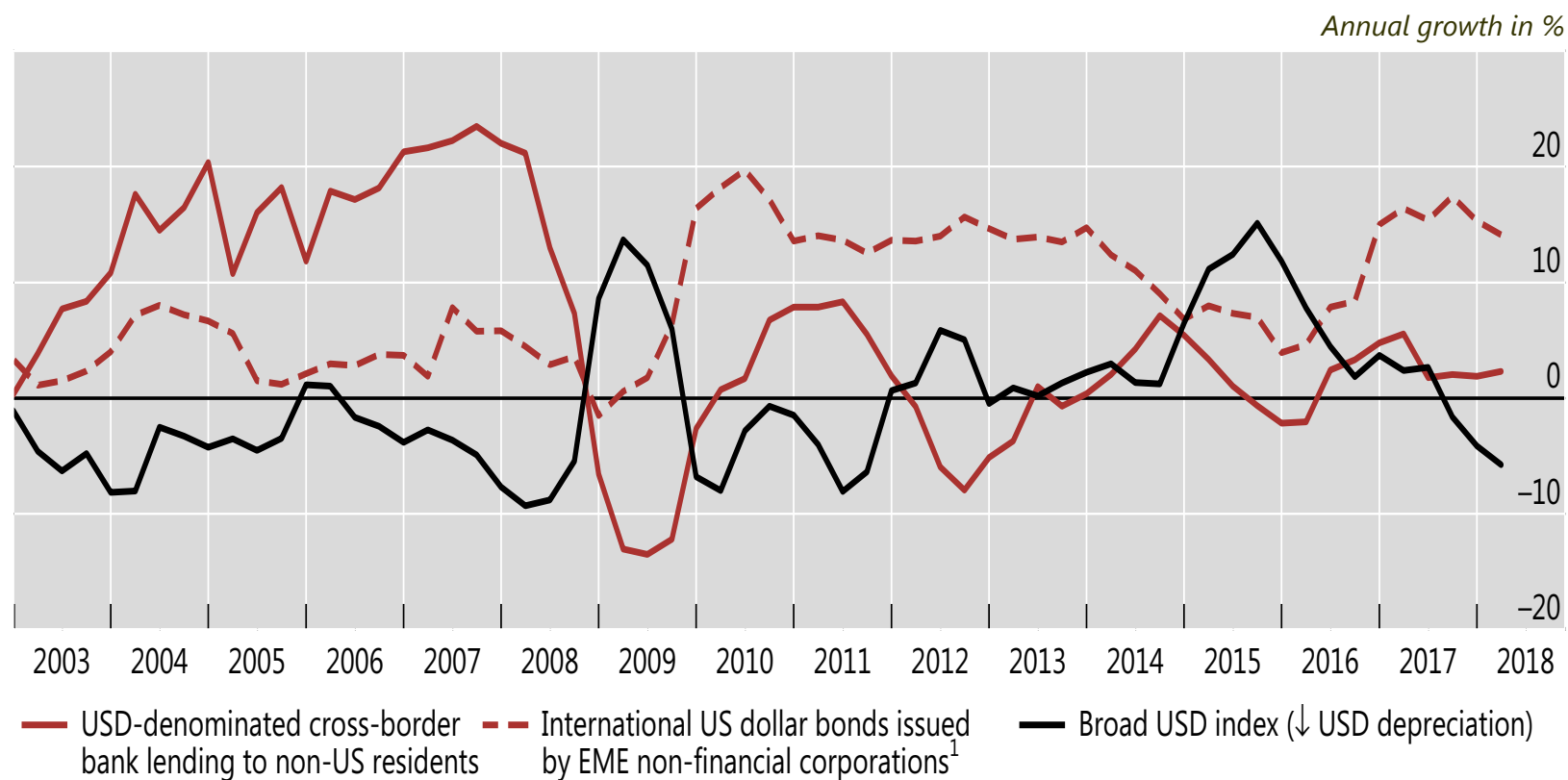
Exchange rates and credit conditions

- 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 ε)
 - 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.

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)

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

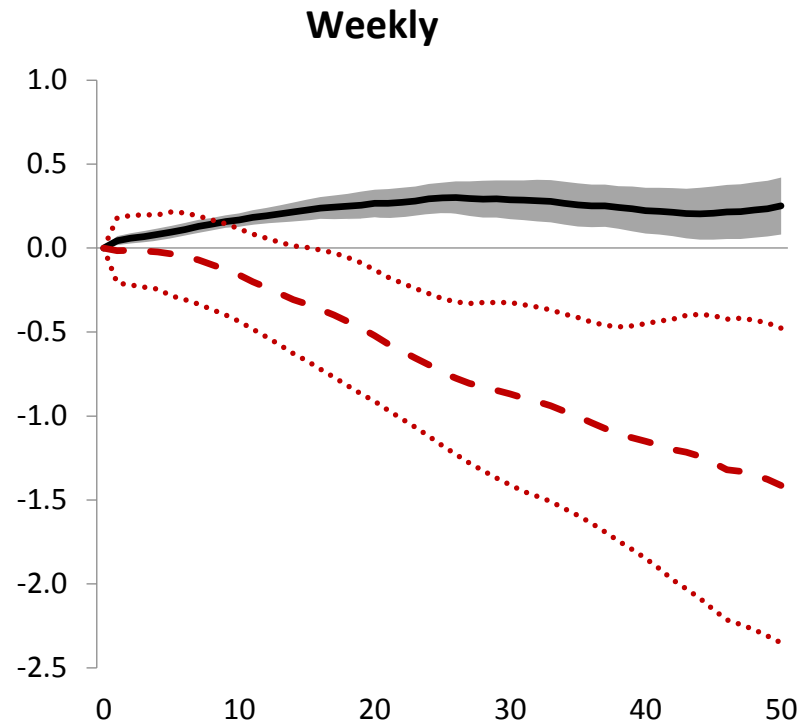
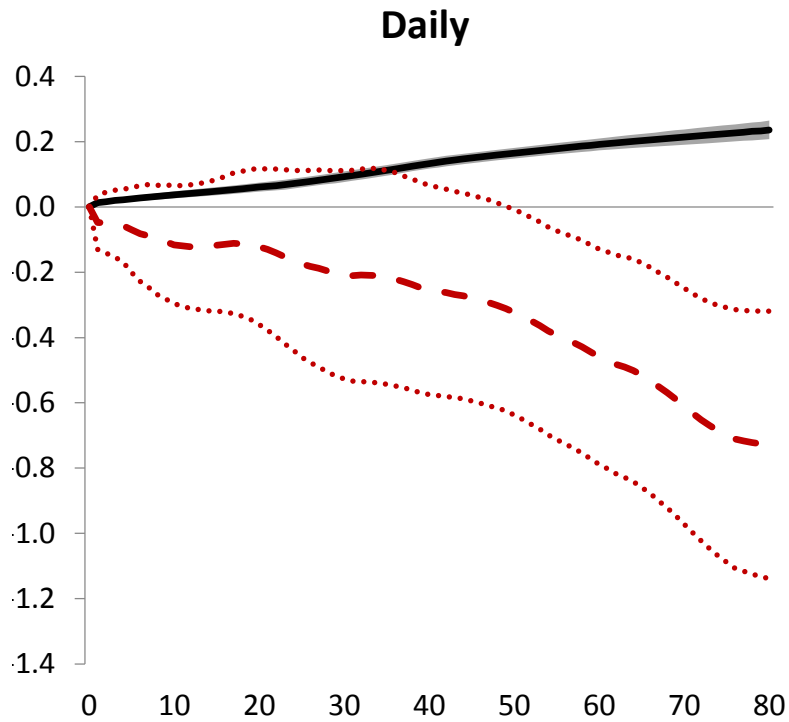
Hofmann, Shin, Villamizar-Villegas (2018): Empirical analysis

- 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

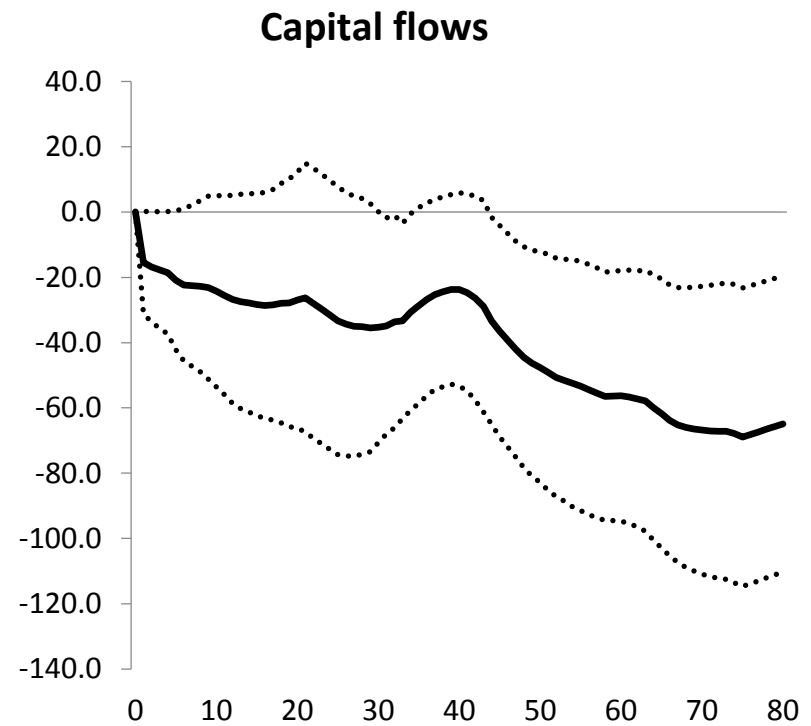
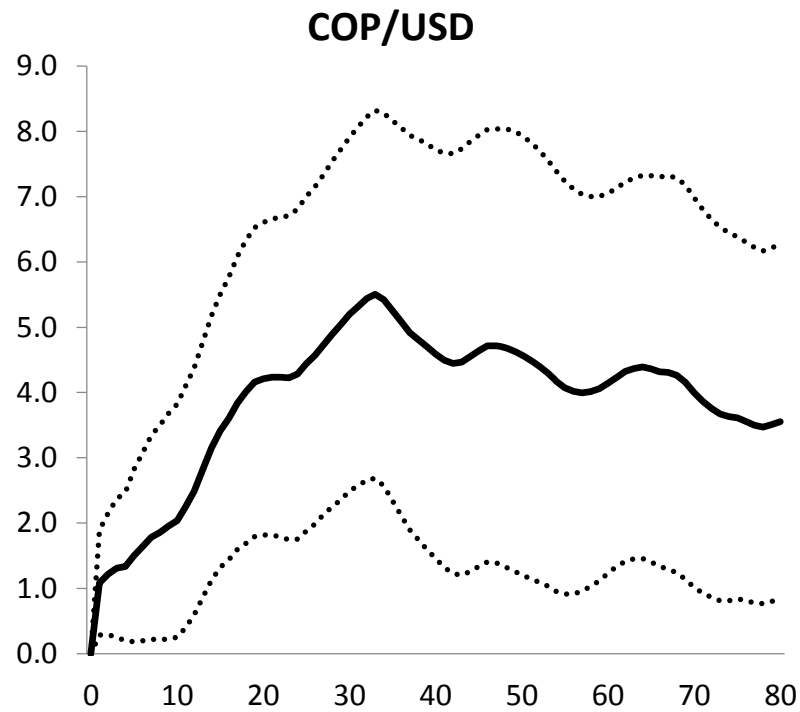


 **Sterilised FX intervention**

 **Capital inflows**

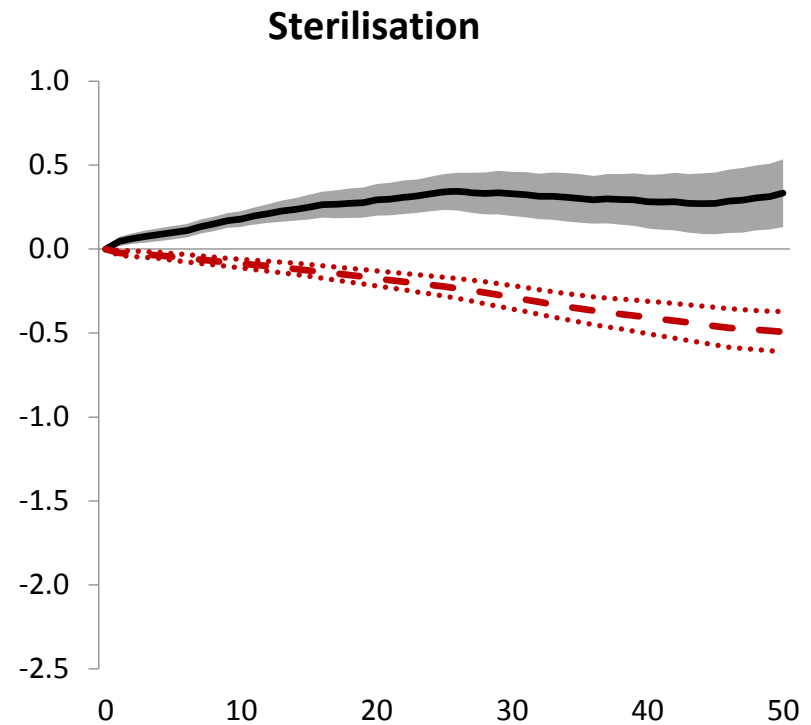
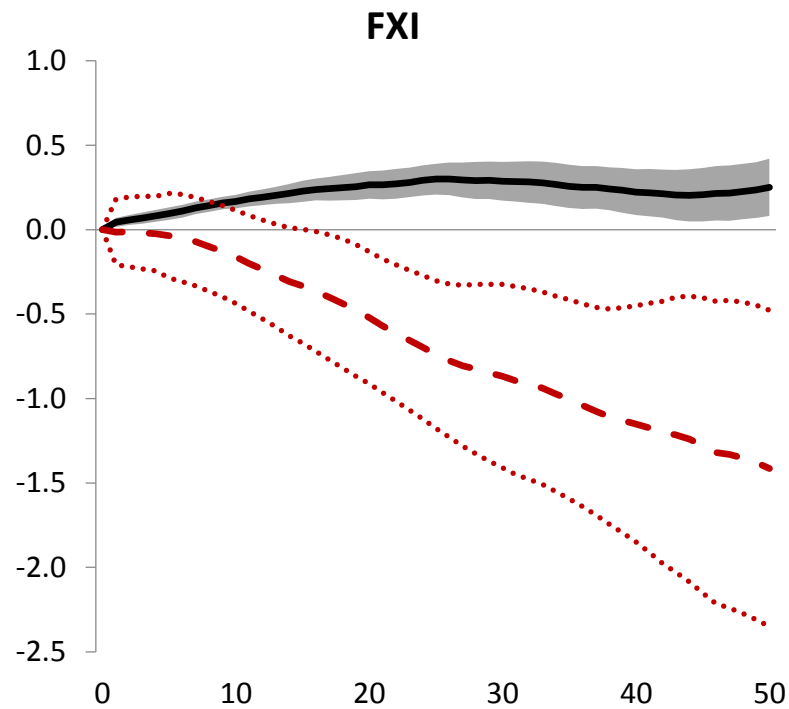
Size of impulse normalised to 100 million USD

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)

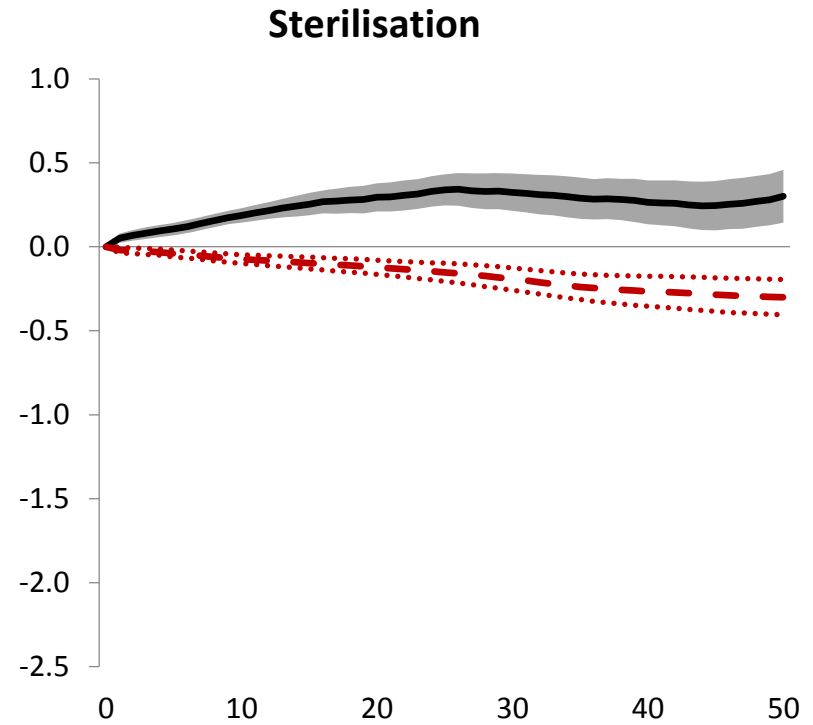
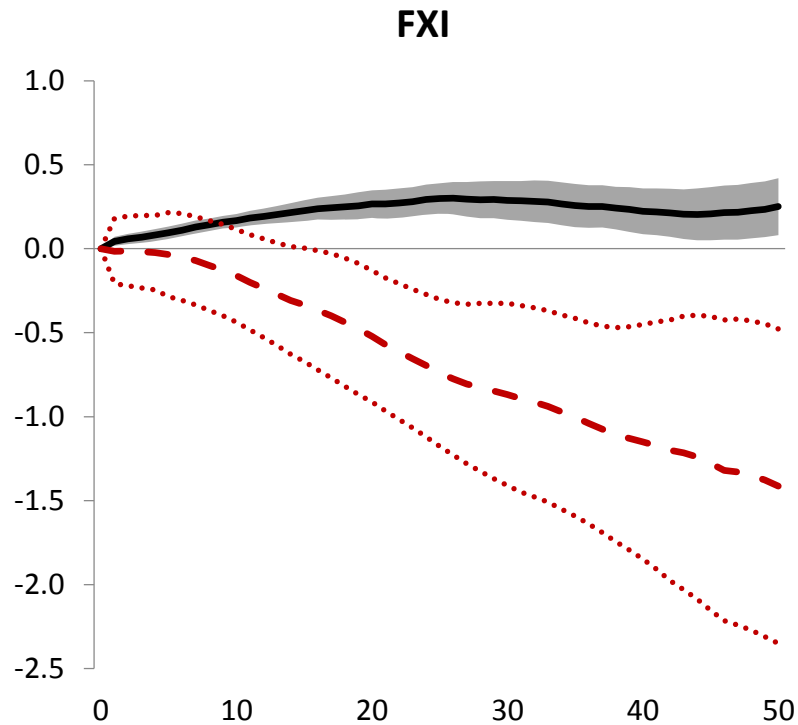


 **FXI/Sterilisation operation**

 **Capital inflows**

Size of impulse normalised to 100 million USD

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

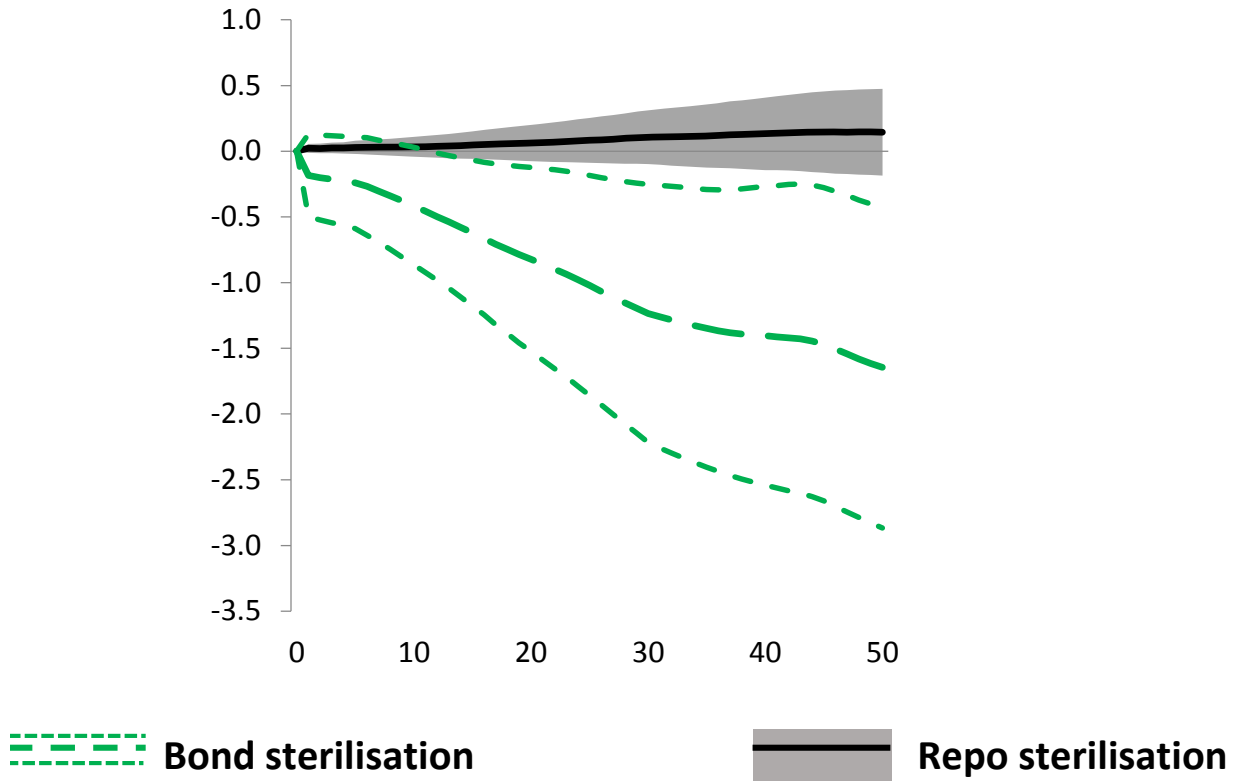


 **FXI/Sterilisation operation**

 **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

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

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

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