# Markus' intro

- Previous webinars
  - Pinelopi Goldberg: International trade: Global value chains
    - Interwoven supply network, COVID transmission, best development aid
  - Hyun Song Shin: International finance: Original Sin Redux

- Speakers

# Safe Asset Perspective

- A **Safe Asset** Perspective on
  International Capital Flows and Sudden Stops
    - Brunnermeier-Sannikov (2019) *"International Monetary Theory: A Risk Perspective"*

- **Safe Asset** (≠ risk-free asset)                    *(see "The I Theory of Money")*
    - Good friend analogy               valuable/liquid when you need it
    - Safe asset tautology              multiple equilibria (bubble & no)

- **Money/Government debt** in US, Germany, Japan is safe asset
    - Precautionary savings again (idiosyncratic) risk
    - Private insurance role – hence low yield
    - Bubble/Ponzi scheme: Never paid off, always rolled over
    - Works if $r < g$              (see Blanchard for empirical evidence)

# Real risk free rate

- Real risk-free rate

$$r_t^f = \rho + \underbrace{\frac{1}{IES} E[g_t^c]}_{\substack{consumption \\ smoothing}} - \underbrace{\frac{1}{2} \underset{RA}{\underbrace{\gamma}} (1 + \frac{1}{IES})[\underbrace{(\sigma_t^c)^2}_{agg.risk} + \underbrace{(\tilde{\sigma}_t^c)^2}_{ido\ risk}]}_{precautionary\ savings}$$

- $\sigma_t^c$ - Consumption risk can be
  - Exogenous shock
  - Endogenous shock due to amplification/runs/sudden stops
    - Depends on denomination of debt

# Risky return/risk premium

- US, Germany, Japan … attractive government funding

- Can EME also play the scheme? They are trying at least?
  - When?
  - Challenge 1: Might not be risk-free due to sudden stop $r_t^{\mathbb{P}} > r_t^{\$}$

$$E\left[r_t^{\mathbb{P}}\right] = r_t^f \quad + \quad \underbrace{\underbrace{\gamma(\sigma_t^c + \tilde{\sigma}_t^c)}_{\substack{price \\ of\ risk}} \underbrace{\sigma_t^{\mathbb{P}}}_{risk}}_{\textit{risk premium}}$$

  - Challenge 2:
    Compete with safe US Treasuries, German Bund, …
    offers return of $r_t^{\$}$

# Risk-on vs. Risk-off region

$$\underbrace{\rho + \frac{1}{IES} E[g_t^c] - \frac{1}{2}\gamma(1 + \frac{1}{IES})[(\sigma_t^c)^2 + (\tilde{\sigma}_t^c)^2]}_{=r_t^f} + \underbrace{\underbrace{\gamma(\sigma_t^c + \tilde{\sigma}_t^c)}_{\substack{price \\ of\ risk}} \underbrace{\sigma_t^{\mathbb{P}}}_{risk}}_{risk\ premium}$$

- As (idio) risk $\tilde{\sigma}_t^c$ increases,
  - Required $r_t^f$ declines
  - Investment rate and growth rate $g^{EME}$ declines $\Rightarrow$ lowers $r^f$ again, but
    - $\mathbb{P}$-government debt bubble less sustainable.

- ... but currency competition with \$-treasuries
  - Risk-on/low risk $\tilde{\sigma}_t^c$ -region with \$-borrowing since $r_t^f > r^\$$
    - Domestic $\mathbb{P}$-government debt serves as safe asset
    - High investment rate funded with \$-debt $\Rightarrow$ boosts $g^{EME}$
  - Risk-off/high $\tilde{\sigma}_t^c$ -region with \$-saving when $r_t^f > r^\$$ - Sudden reversal
    - Low investment rate $\Rightarrow$ low $g^{EME}$
    - Ponzi scheme not possible $\Rightarrow$ standard DSA with intertemporal gov. budget constraint
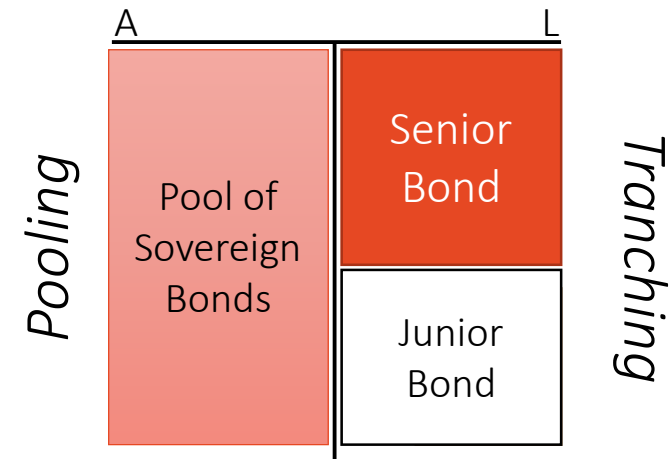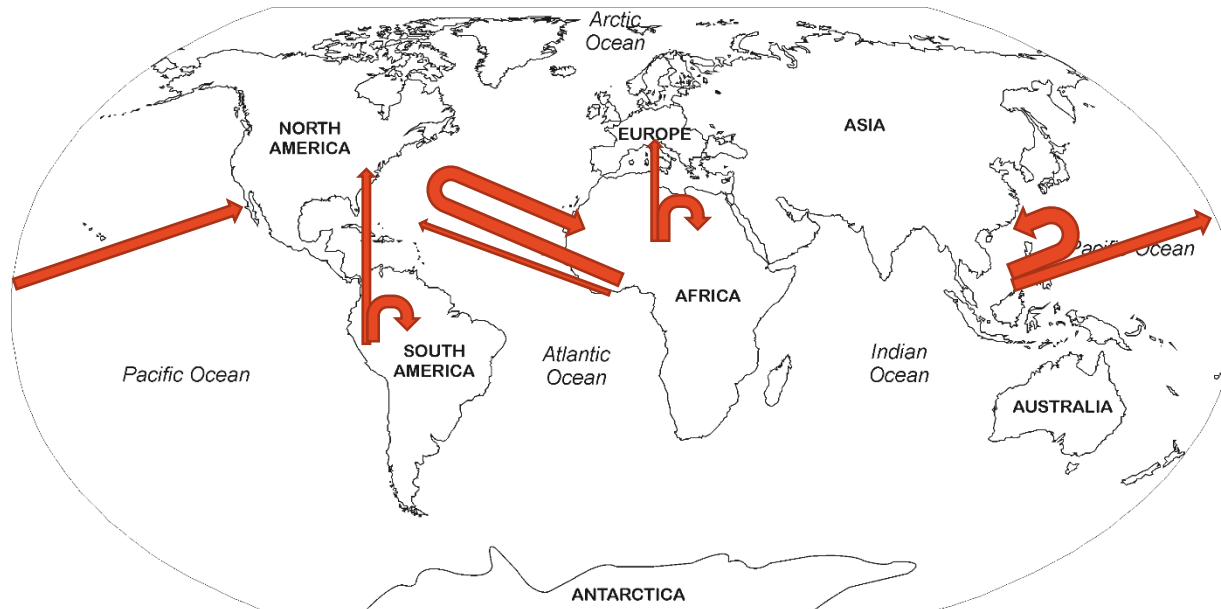- $\mathbb{P}$- Currency collapses and risk premium (including term premia) rise

# Risk & debt denomination

- Risk $\sigma_t^c + \tilde{\sigma}_t^c$ allocation:
  depends on denomination of debt & maturity mismatch
  - Well allocated, risk is lower
  - Not well allocated, risk is amplified $\Rightarrow$ endogenous risk

- Risk can be on
  - End-borrowers side
  - Domestic banks ⎤ Original Sin
  - Foreign banks
  - Foreign investor

- Problem:
  individual end-borrower and foreign takes exchange rate
  moves and GE price shifts as given – misallocations

# Global Financial Architecture

- Can EME provide their own safe asset
    - Reduce risk premium
    - Only possible if one reduces endogenous risk

- Rechannel capital outflows                     with    GlosBies



*Pooling*

A                                               L

Pool of
Sovereign
Bonds

Senior
Bond

Junior
Bond

*Tranching*

Brunnermeier-Huang (2019)
"A global safe asset from and
for Emerging Economies"

# Poll 01

1. Do you prefer an international financial architecture
   a. In which the IMF and US Federal Reserve actively intervenes to channel back funds to other economies, e.g. with swap lines
   b. Autonomous system which is self-stabilizing

2. Which region are in
   a. US/Canada
   b. Latin America
   c. Europe
   d. Asia
   e. Australia
   f. Africa

# Capital flows and "Original Sin Redux"

Princeton University, Bendheim Center for Finance webinar series

Hyun Song Shin*, Economic Adviser and Head of Research, BIS

20 April 2020

**Borrowers**     **Investors**

A    L       A    L

Country A
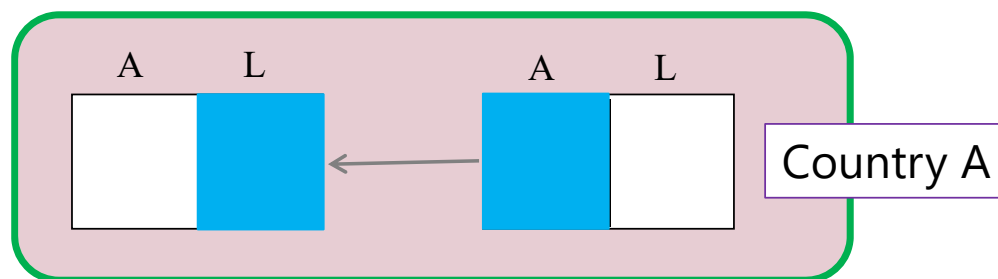
A's currency

# Finding 1: lenders tend to lend in their own currency
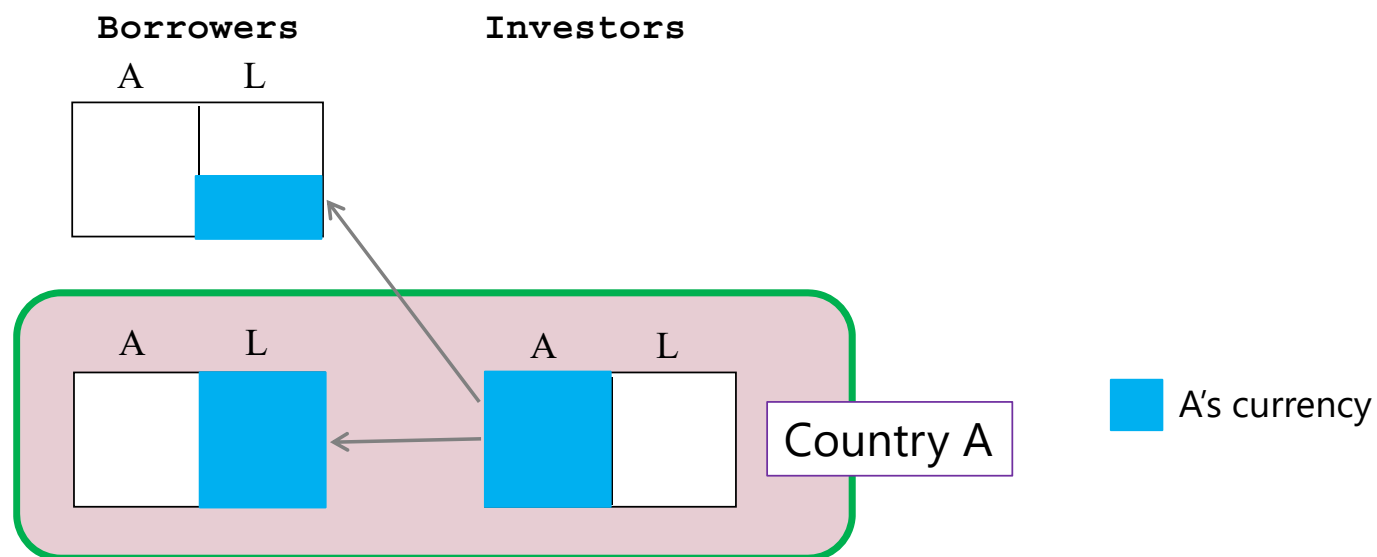


Borrowers · Investors · A · L · A · L · A · L · Country A · A's currency
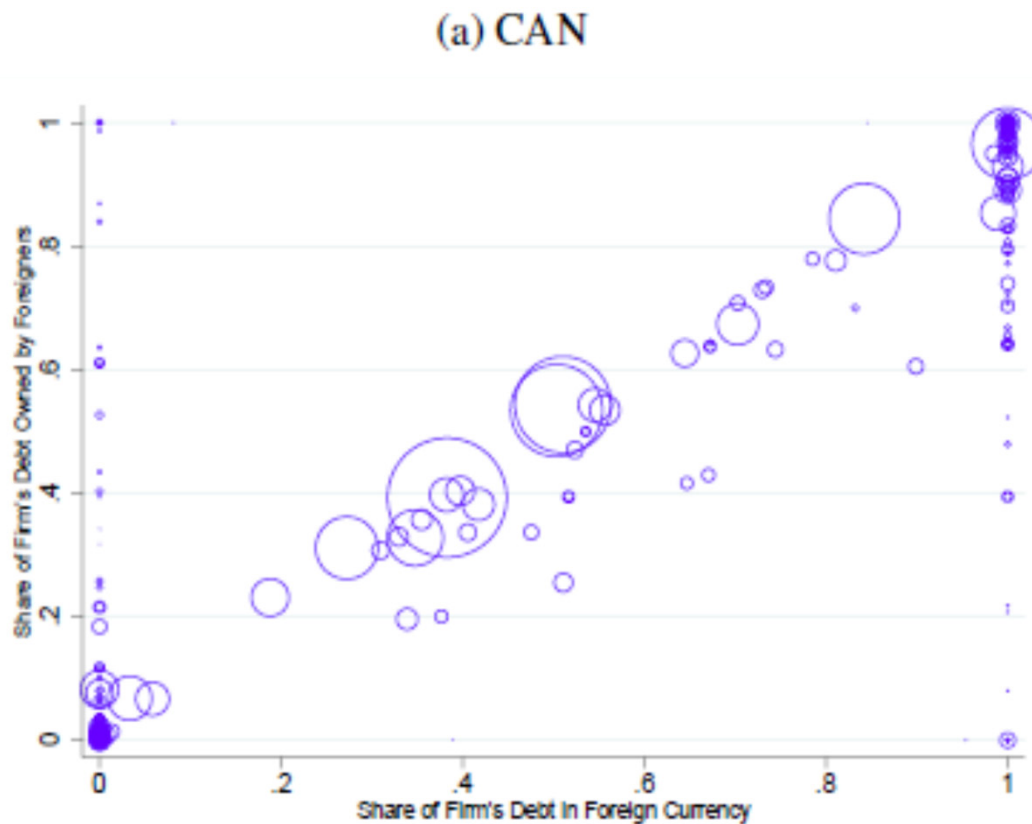
Maggiori, Neiman and Schreger (2018) "The rise of the dollar and fall of the euro as international currencies"

# Finding 2: private sector borrowers are subject to "original sin"; when borrowing from abroad, they do so in foreign currency
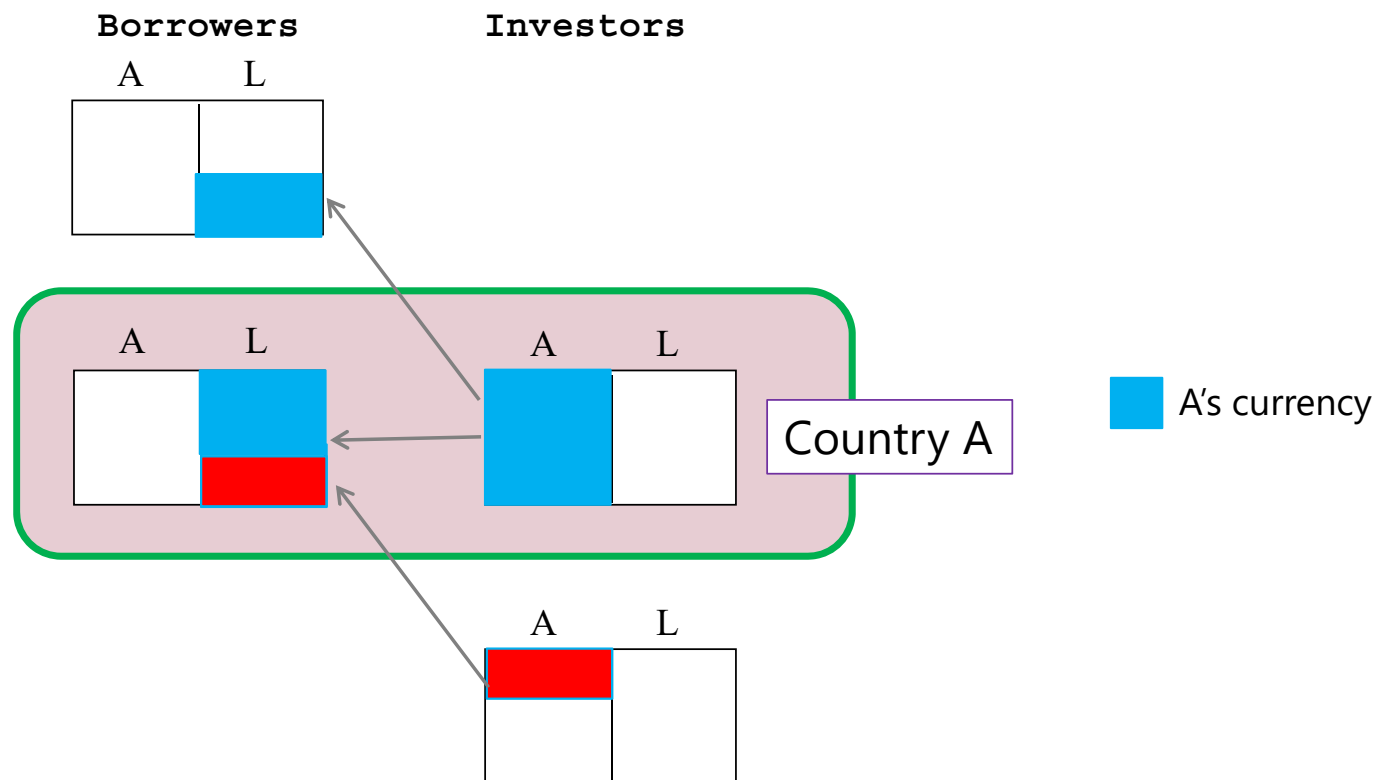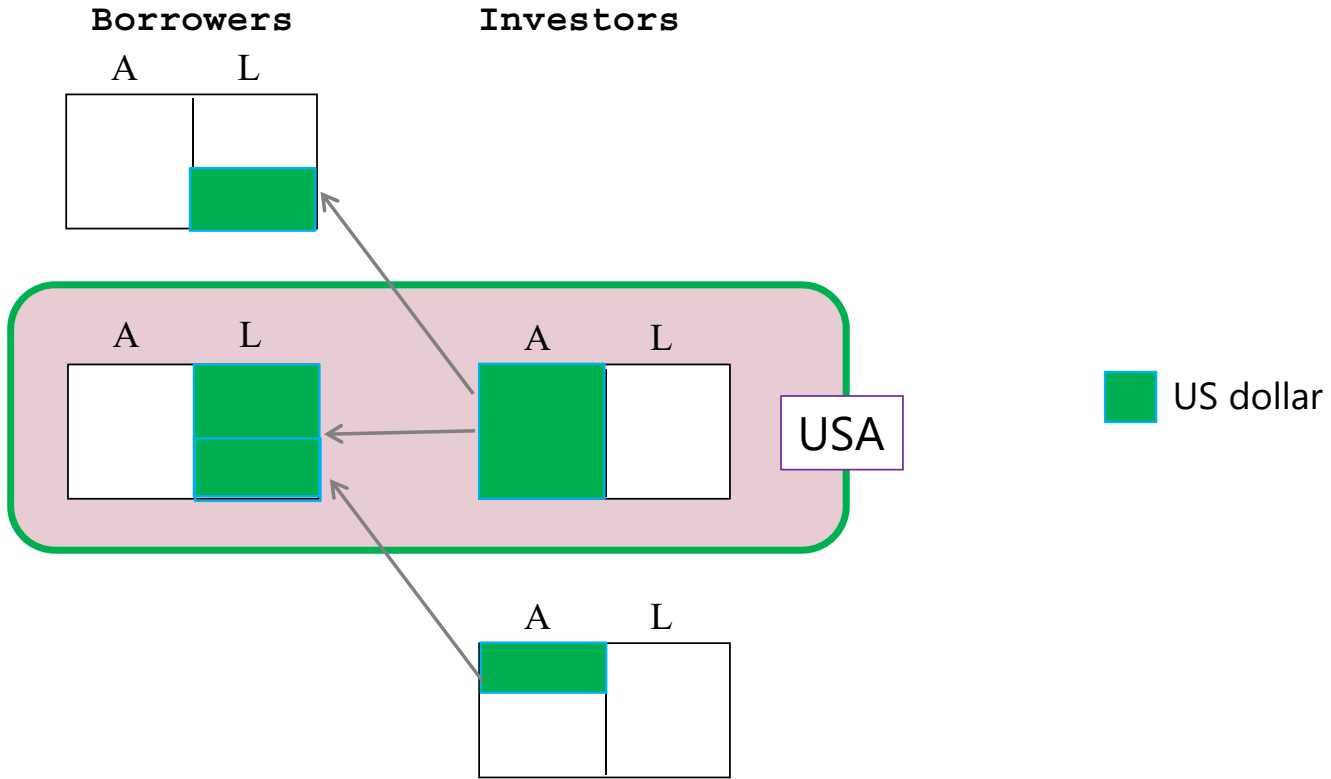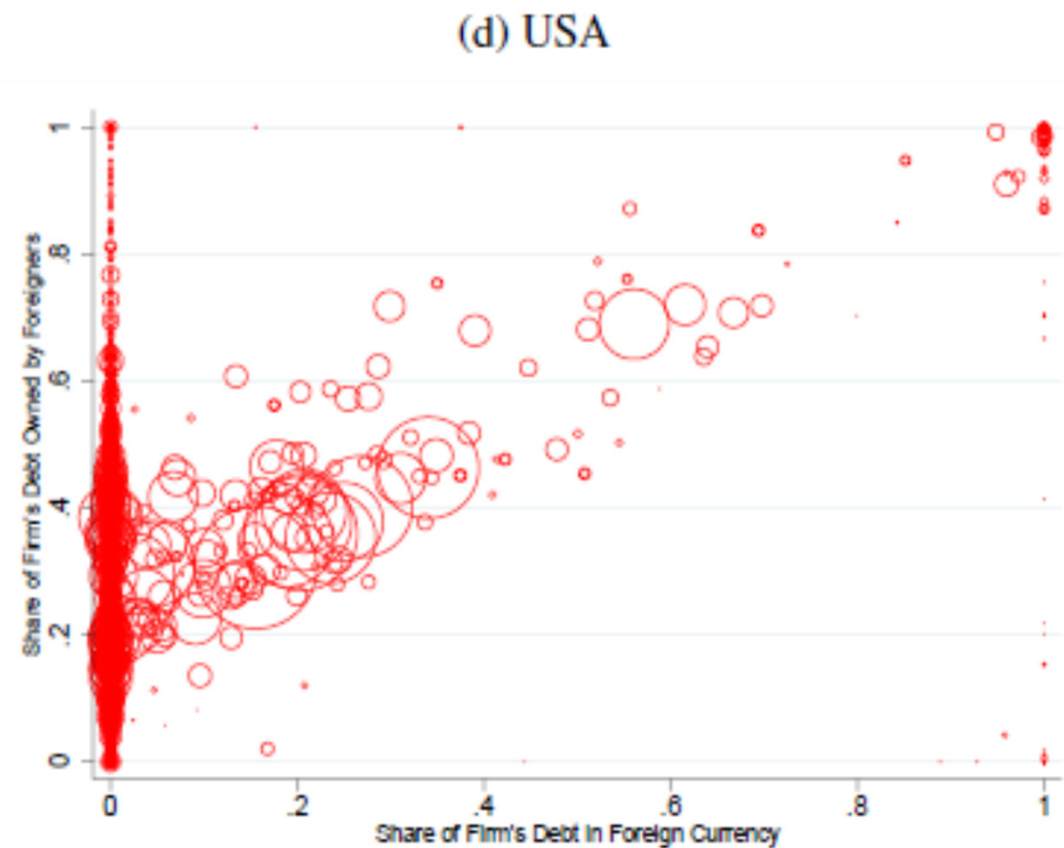
# Canadian corporate bond issuance



(a) CAN

Maggiori, Neiman and Schreger (2018) "The rise of the dollar and fall of the euro as international currencies"

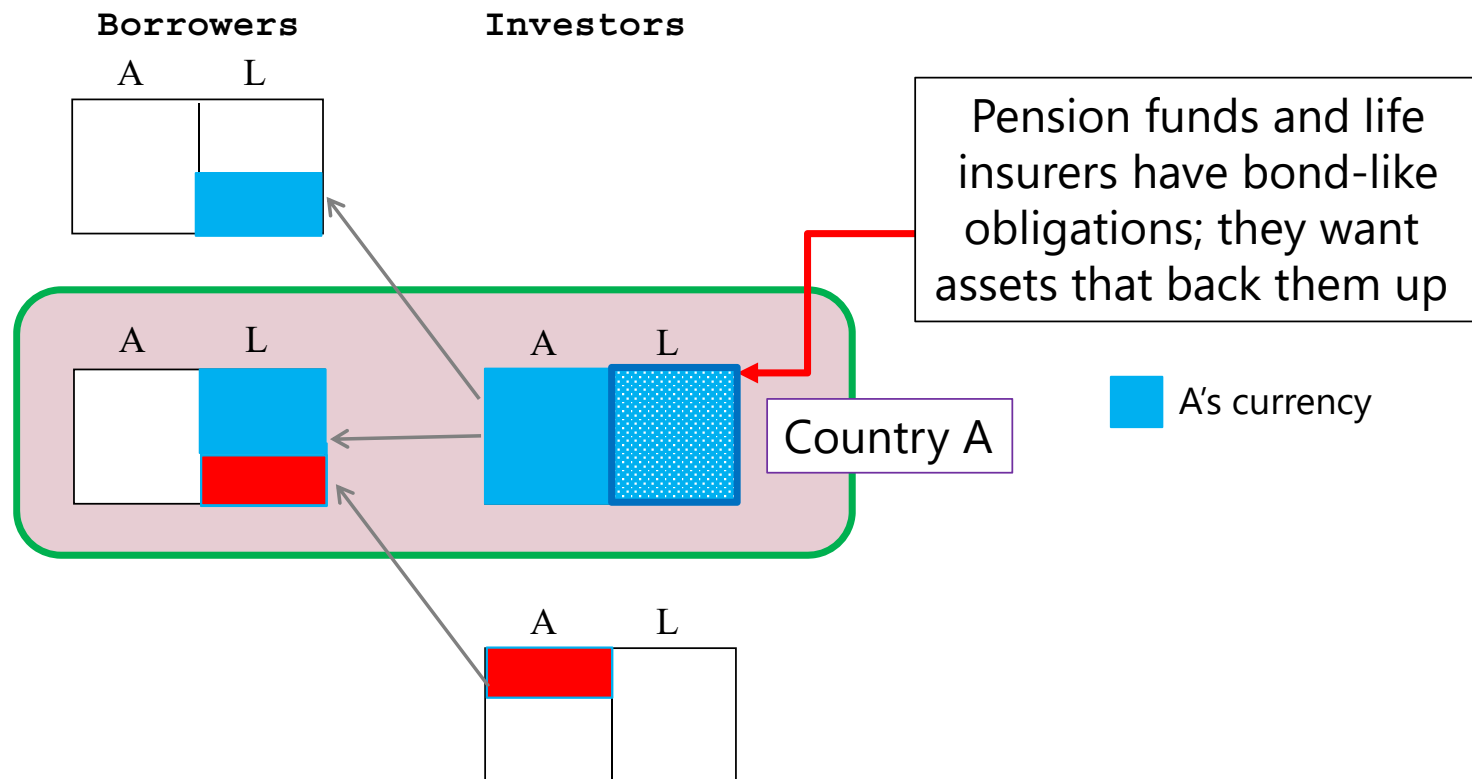# Finding 3: exception is the US and the US dollar

Borrowers

Investors

A     L

A     L        A     L

USA

A     L

■ US dollar

# US corporate bonds issuance

(d) USA



Maggiori, Neiman and Schreger (2018) "The rise of the dollar and fall of the euro as international currencies"
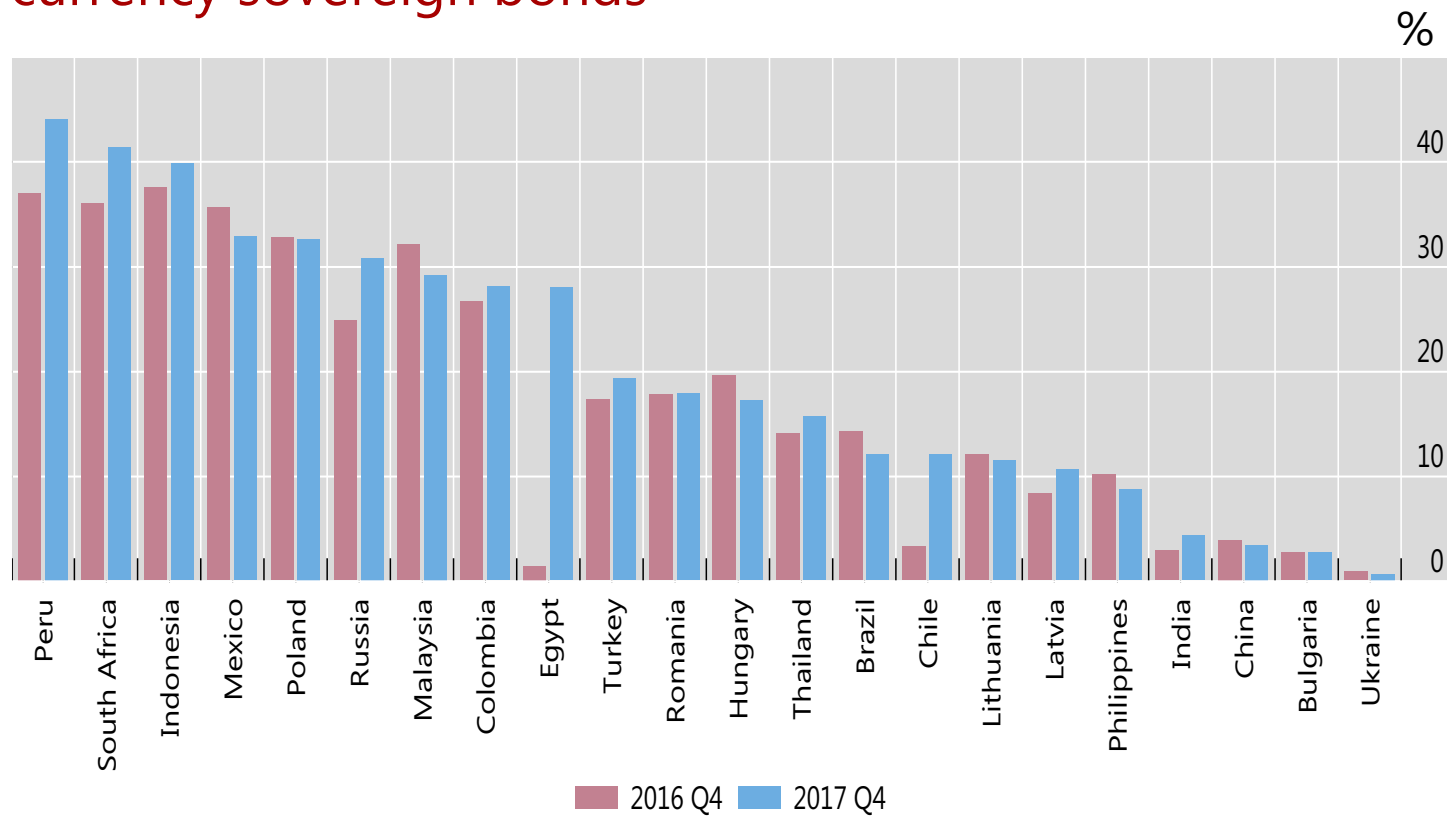
# Liabilities side of lender's balance sheet looms into view

# Lessons from 1990s EME financial crises

- Avoid currency mismatch

- Avoid maturity mismatch

# Overcoming original sin: non-resident holdings of EME local currency sovereign bonds



Source: World Bank

Legend: 2016 Q4, 2017 Q4

Categories: Peru, South Africa, Indonesia, Mexico, Poland, Russia, Malaysia, Colombia, Egypt, Turkey, Romania, Hungary, Thailand, Brazil, Chile, Lithuania, Latvia, Philippines, India, China, Bulgaria, Ukraine
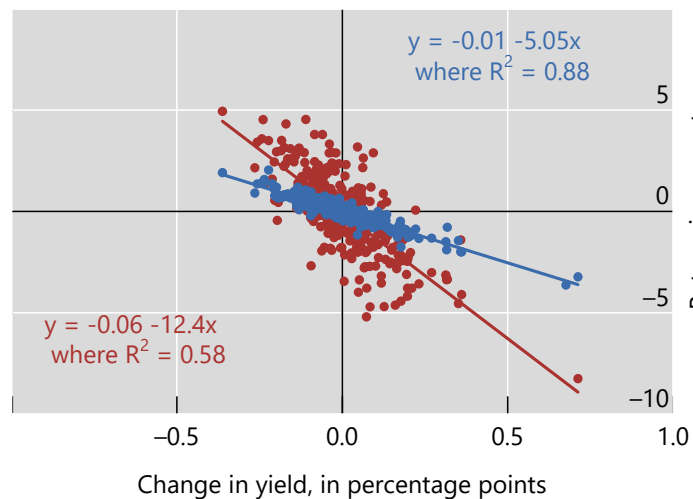
# Two duration measures

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

- Compare duration measures with:
  - Percentage return in local currency terms
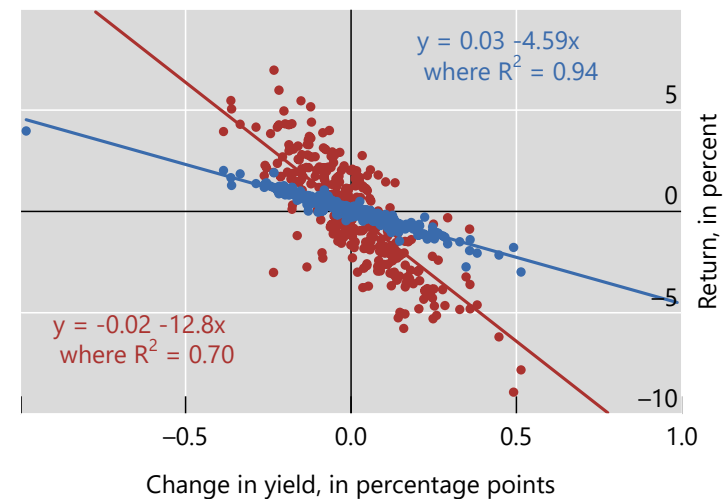  - Percentage return in dollar terms
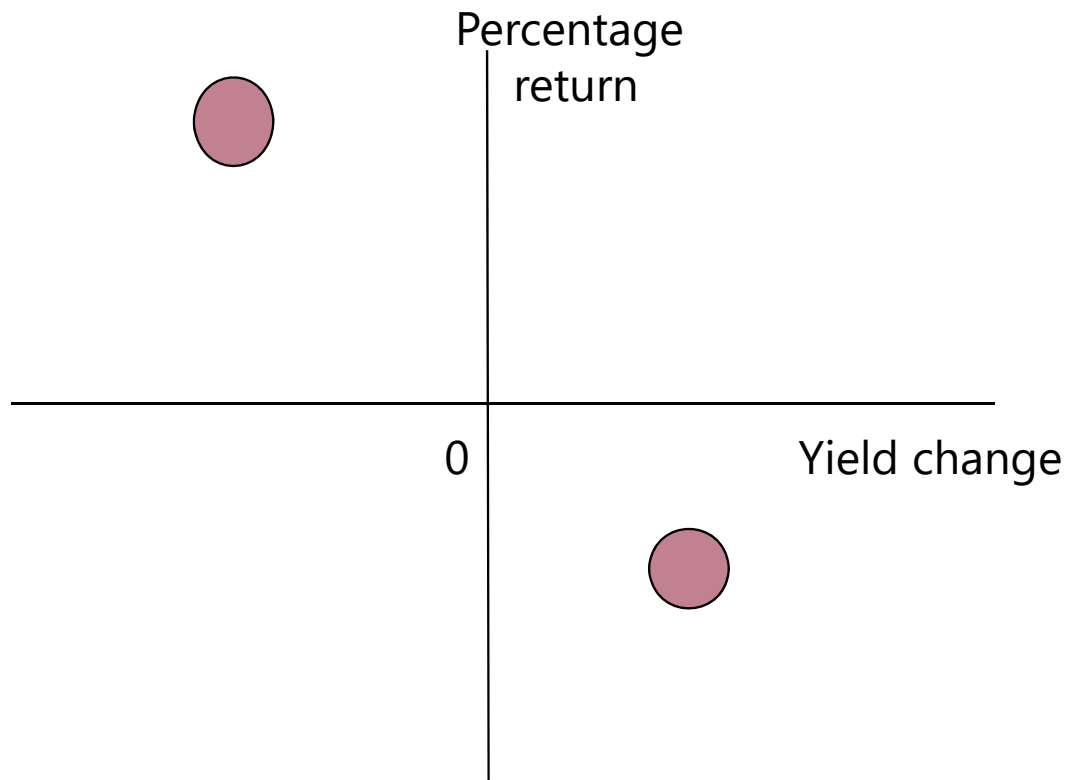
# EMEs local currency sovereign bond returns[1],
# January 2013 – October 2018

### Mexico



$y = -0.01 -5.05x$
where $R^2 = 0.88$

$y = -0.06 -12.4x$
where $R^2 = 0.58$

Change in yield, in percentage points

Return, in percent

- Local currency return

### South Africa



$y = 0.03 -4.59x$
where $R^2 = 0.94$

$y = -0.02 -12.8x$
where $R^2 = 0.70$

Change in yield, in percentage points
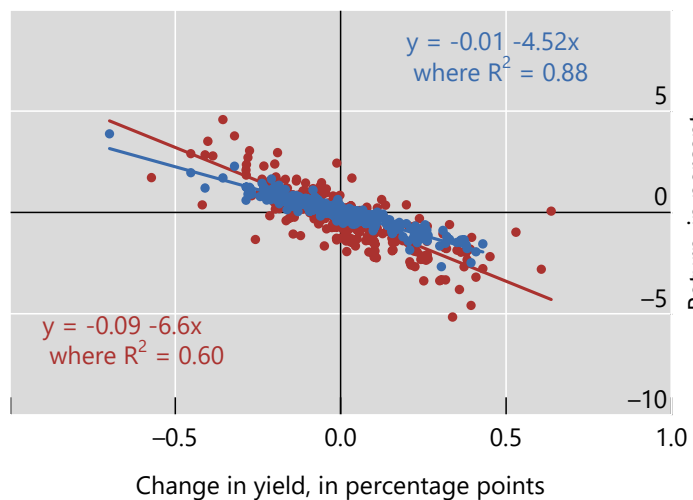
Return, in percent

- US dollar return

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

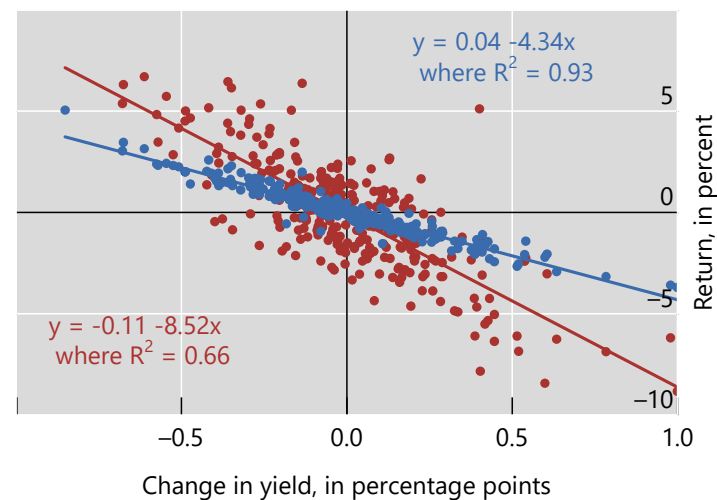Sources: JPMorgan Chase; BIS calculations.

# EMEs local currency sovereign bond returns[1], January 2013 – October 2018

### Indonesia



$$y = -0.01\ -4.52x$$
$$\text{where } R^2 = 0.88$$

$$y = -0.09\ -6.6x$$
$$\text{where } R^2 = 0.60$$

Return, in percent

Change in yield, in percentage points

• US dollar return

### Brazil



$$y = 0.04\ -4.34x$$
$$\text{where } R^2 = 0.93$$

$$y = -0.11\ -8.52x$$
$$\text{where } R^2 = 0.66$$

Return, in percent
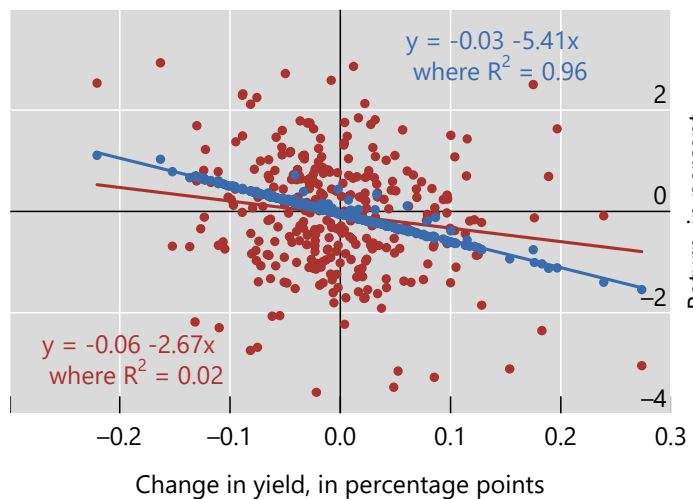
Change in yield, in percentage points

• US dollar return

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

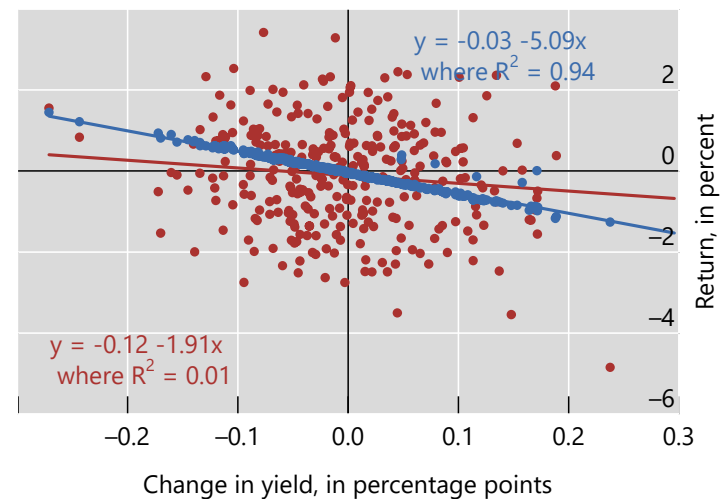Sources: JPMorgan Chase; BIS calculations.

# Advanced economies sovereign bond returns[1], January 2013 – October 2018

### France

$$y = -0.03 -5.41x$$
$$\text{where } R^2 = 0.96$$

$$y = -0.06 -2.67x$$
$$\text{where } R^2 = 0.02$$

Change in yield, in percentage points

Return, in percent

- Local currency return

### Sweden

$$y = -0.03 -5.09x$$
$$\text{where } R^2 = 0.94$$

$$y = -0.12 -1.91x$$
$$\text{where } R^2 = 0.01$$

Change in yield, in percentage points

Return, in percent

- US dollar return

[1] GBI Global Country 5 to 7 year maturity indices for the selected economies.
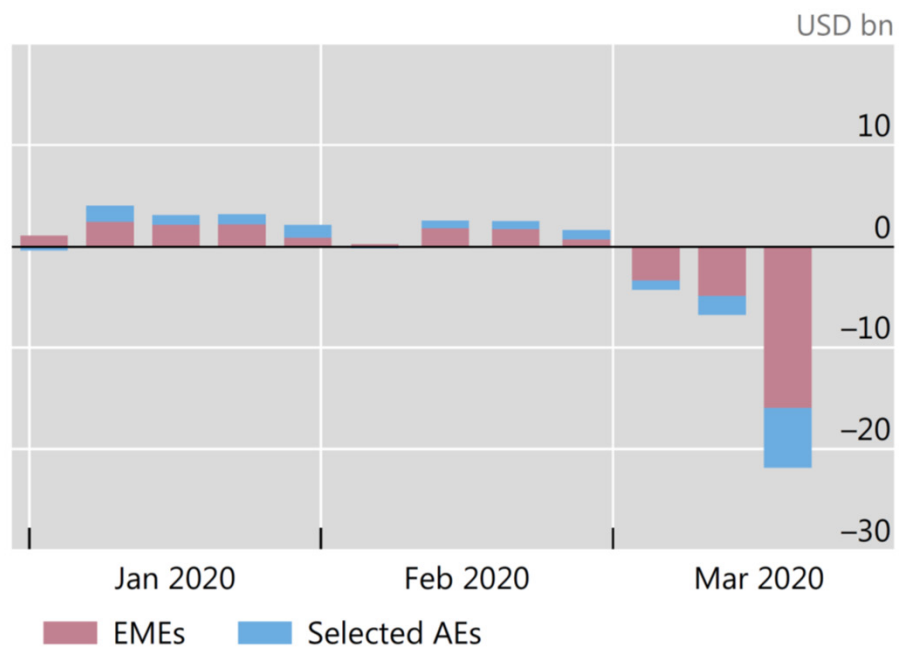
Sources: JPMorgan Chase; BIS calculations.

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# Covid-19 shock

## Bond fund flows

USD bn



EMEs  Selected AEs

## Dollar exchange rate and bond spreads

20 Feb 2020 = 100                                    Basis points
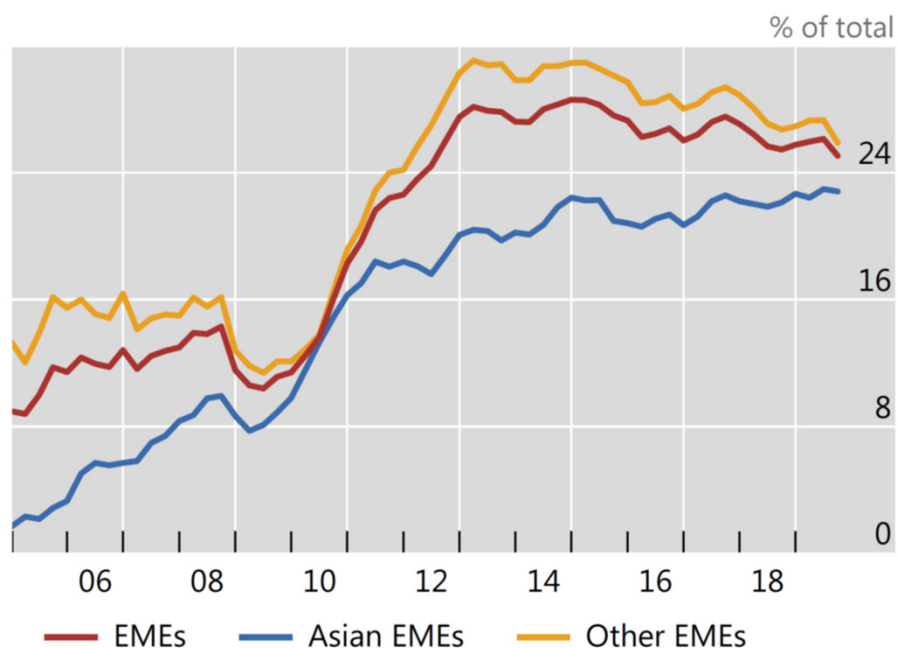


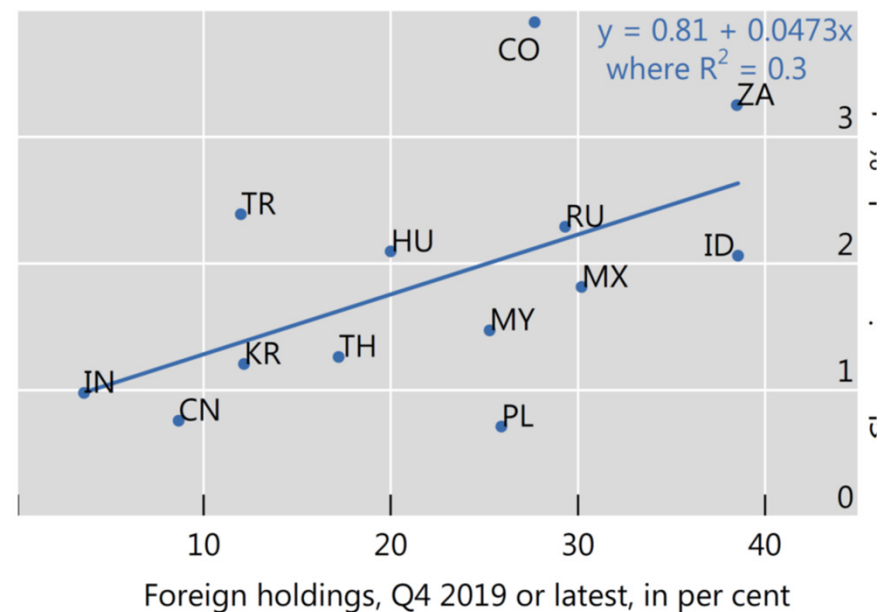— Dollar exchange rate (lhs)   — Bond spreads (rhs)

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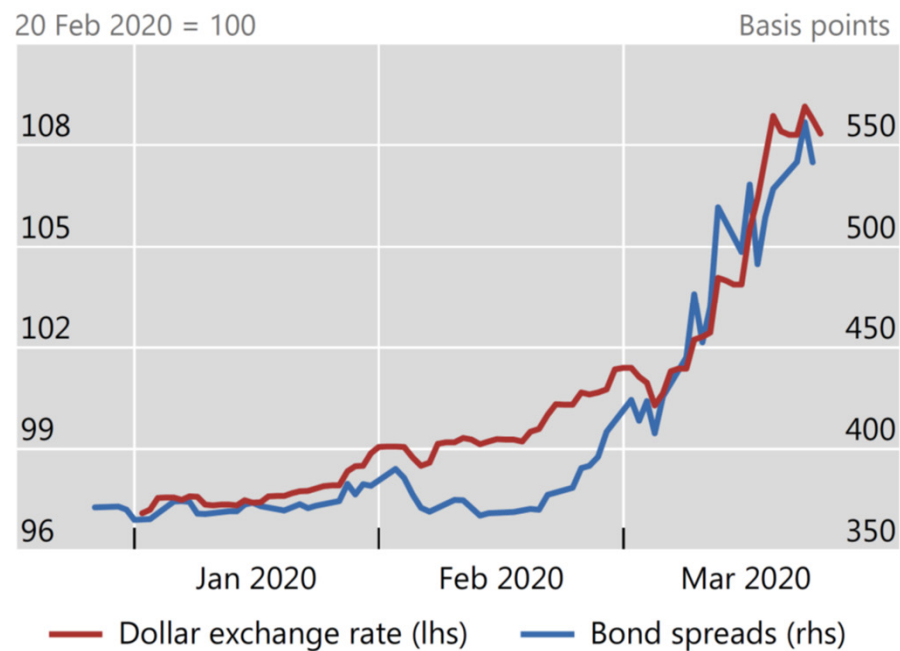
# Foreign ownership in EME local currency bond markets



Foreign ownership in local currency sovereign bond markets
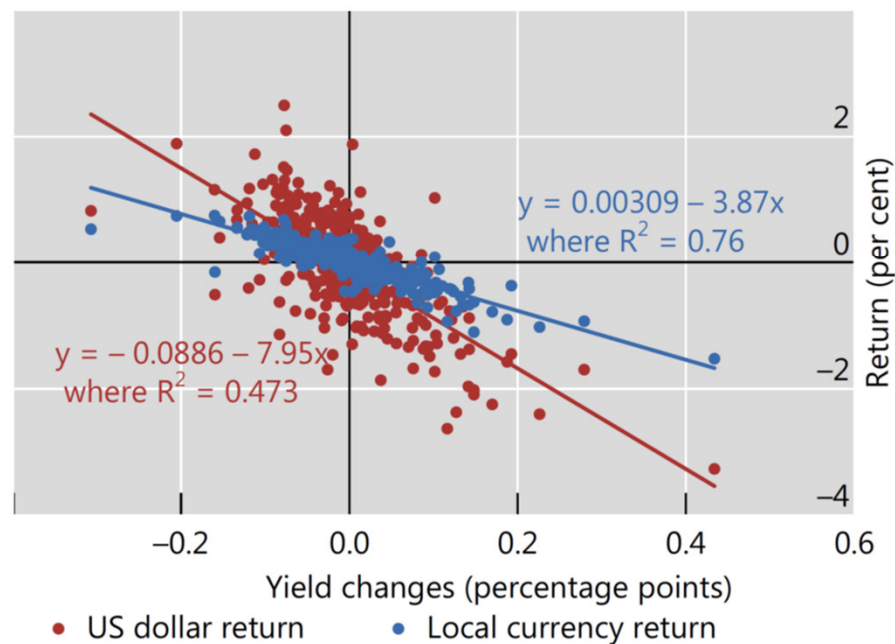
Scatter plot of changes in local currency yield spreads versus the level of foreign holdings
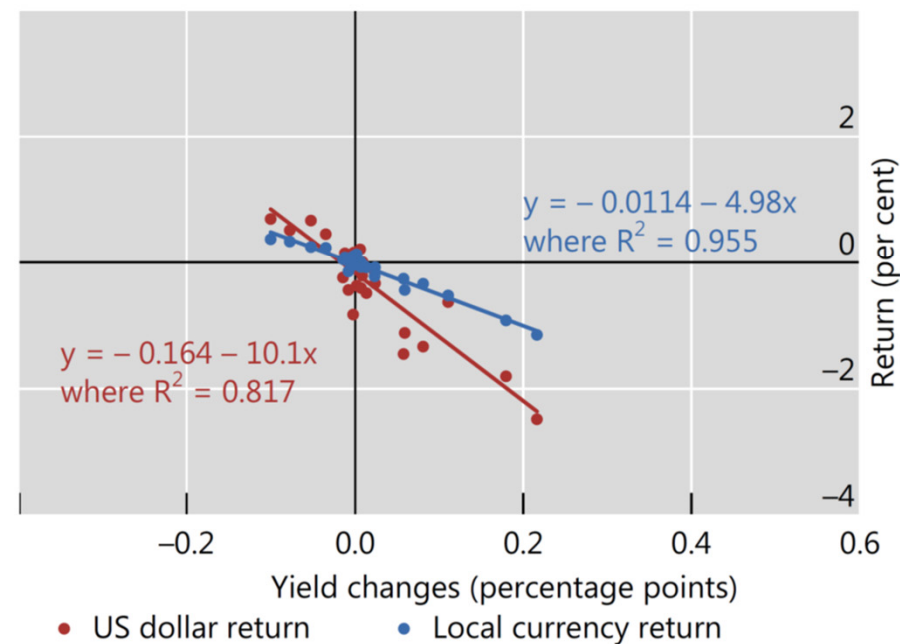
$y = 0.81 + 0.0473x$ where $R^2 = 0.3$

EMEs — Asian EMEs — Other EMEs

Foreign holdings, Q4 2019 or latest, in per cent

# US dollar and local currency returns vis-à-vis yield changes



**Emerging market economies**

Pre-Covid-19 period

$y = 0.00309 - 3.87x$
where $R^2 = 0.76$

$y = -0.0886 - 7.95x$
where $R^2 = 0.473$

Covid-19 period

$y = -0.0114 - 4.98x$
where $R^2 = 0.955$

$y = -0.164 - 10.1x$
where $R^2 = 0.817$

Return (per cent)

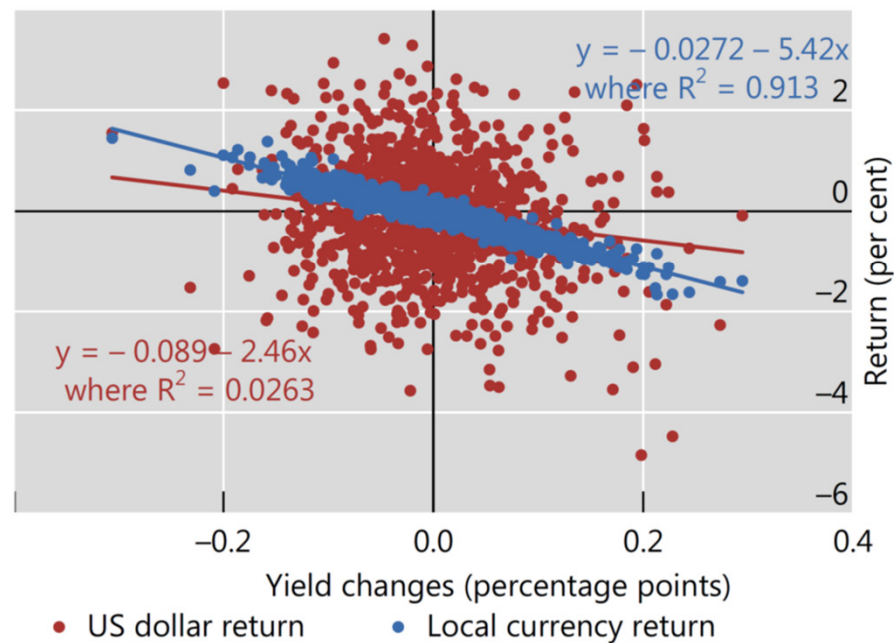Yield changes (percentage points)

● US dollar return  ● Local currency return

# US dollar and local currency returns vis-à-vis yield changes (cont)



**Advanced economies**

Pre-Covid-19 period

$y = -0.0272 - 5.42x$
where $R^2 = 0.913$

$y = -0.089 - 2.46x$
where $R^2 = 0.0263$

Return (per cent)

Yield changes (percentage points)

● US dollar return    ● Local currency return

Covid-19 period

$y = -2.13E\text{-}05 - 4.8x$
where $R^2 = 0.867$

$y = -0.195 - 8.46x$
where $R^2 = 0.329$

Return (per cent)

Yield changes (percentage points)

● US dollar return    ● Local currency return
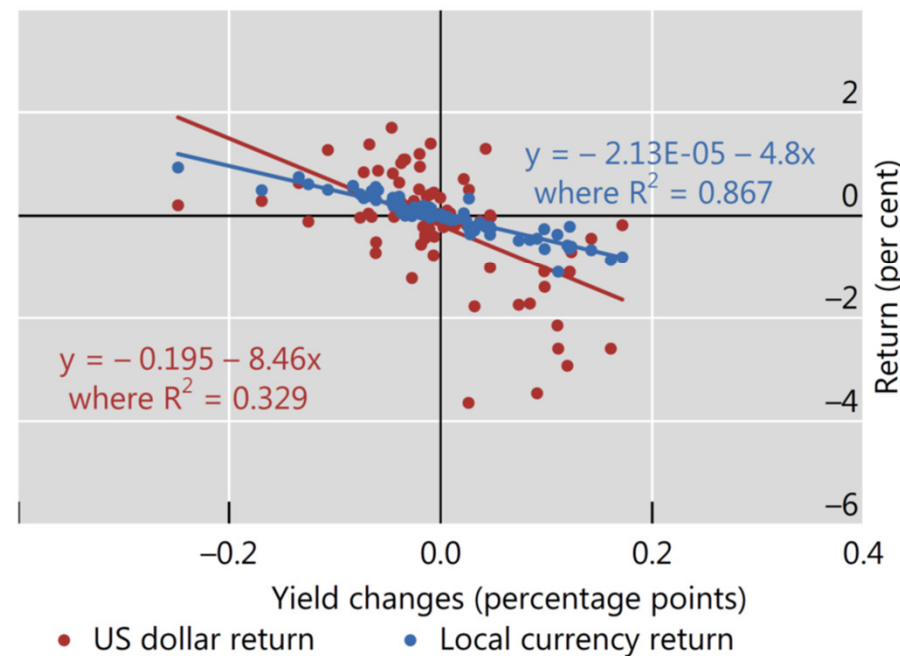
# Exchange rates co-move with bond yields in EMEs

## Exchange rates and sovereign spreads

Basis points          Jan 2013 = 100

— EME local currency sovereign spread (lhs)
— Average exchange rate against USD (rhs)
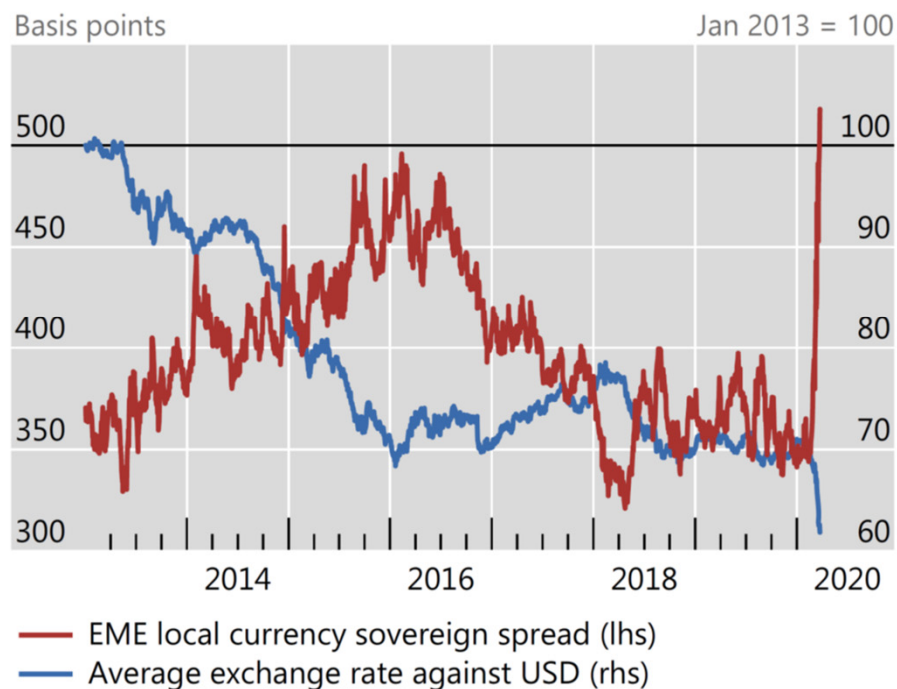
## Impact of exchange rate depreciation

Percentage points

Days

▒ Spread     ■ Risk premium
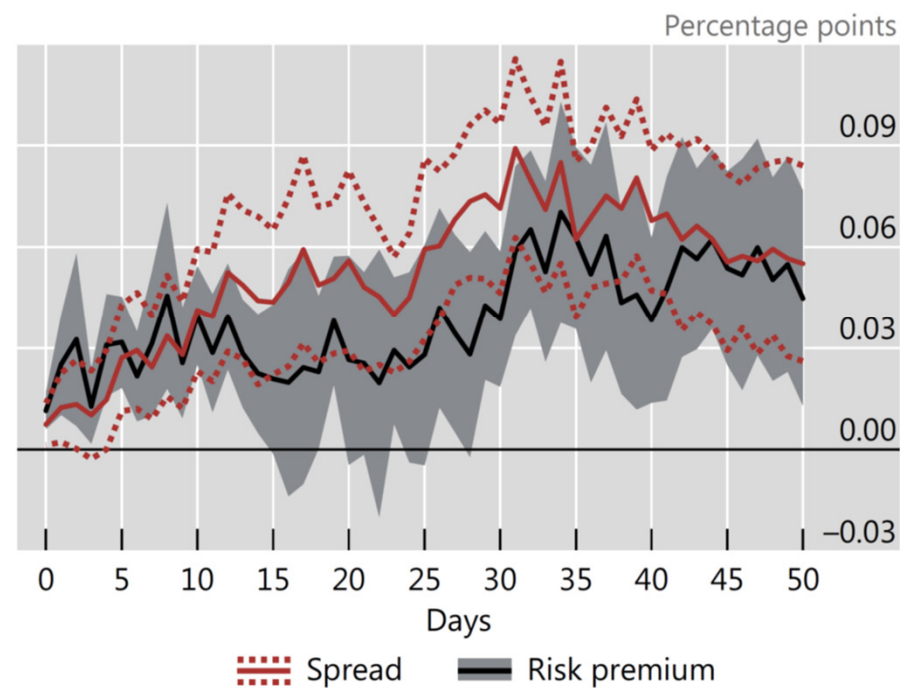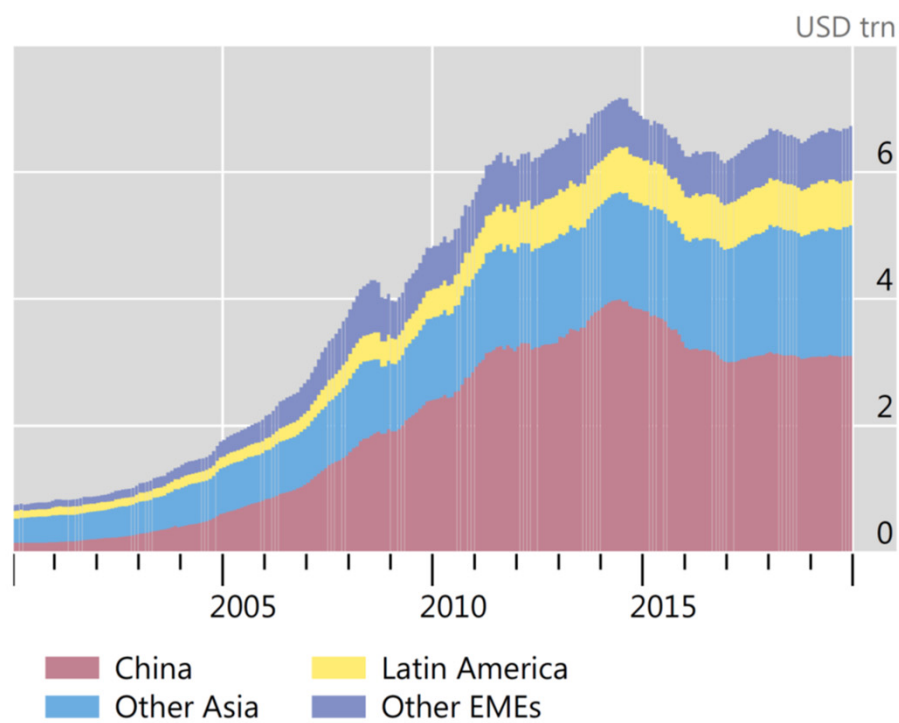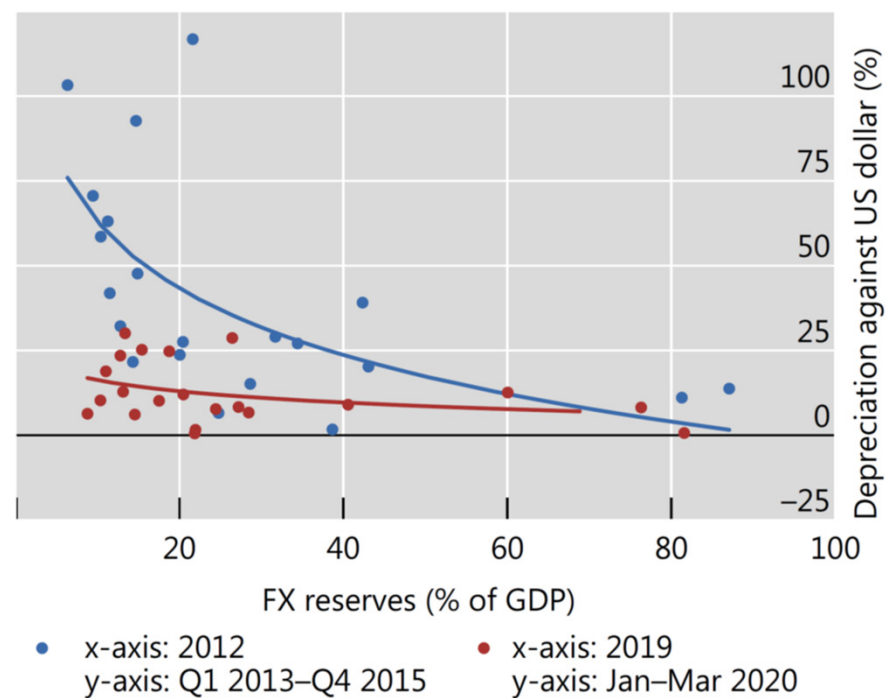
# EME FX reserve buffers



FX reserves

FX reserves cushion the impact of major shocks

# Monetary policy frameworks in EMEs: *BIS Annual Economic Report 2019, Chapter II*