BANK FOR INTERNATIONAL SETTLEMENTS

Global liquidity and monetary policy transmission

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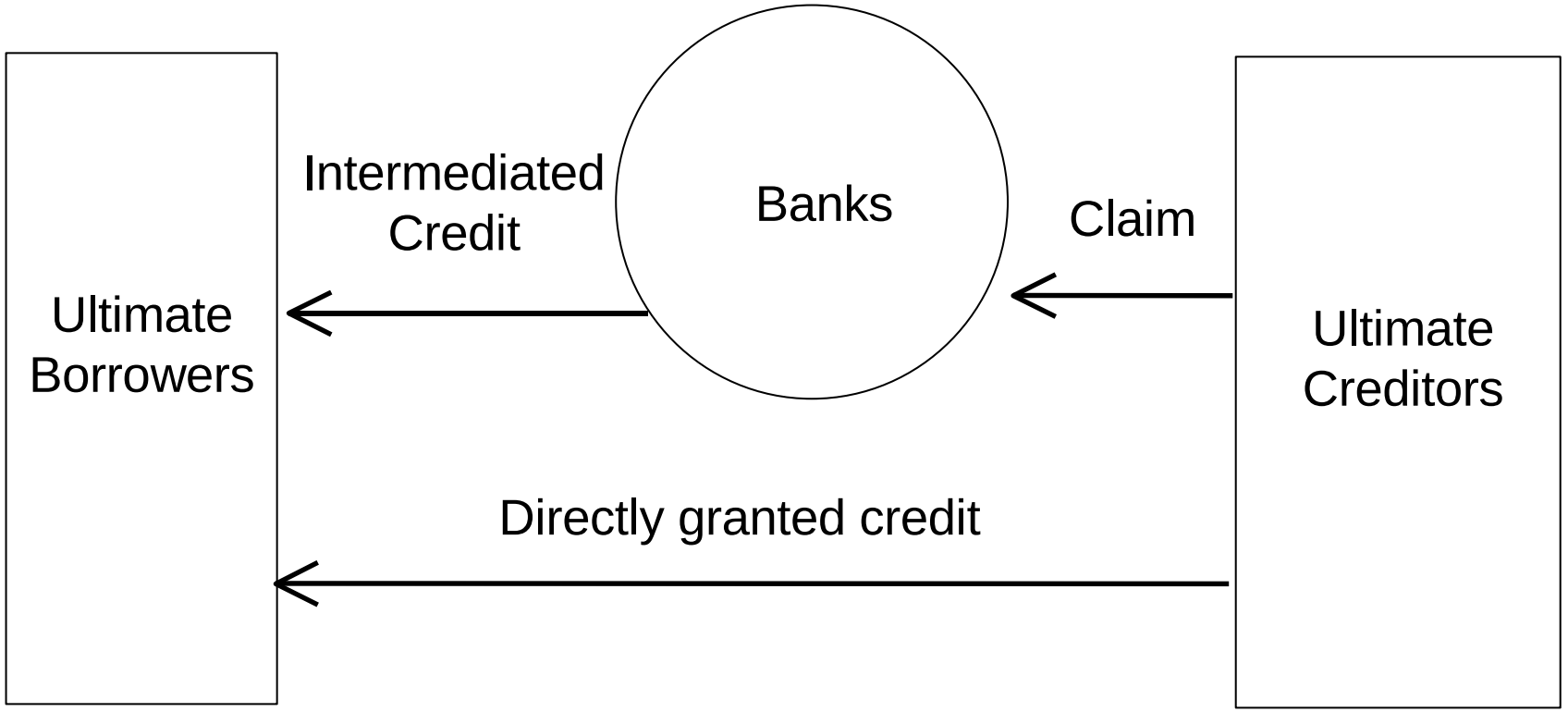
Bank for International Settlements

Liquidity and Market Efficiency – Alive and Well?
6th joint conference organised by SUERF and Bank of Finland

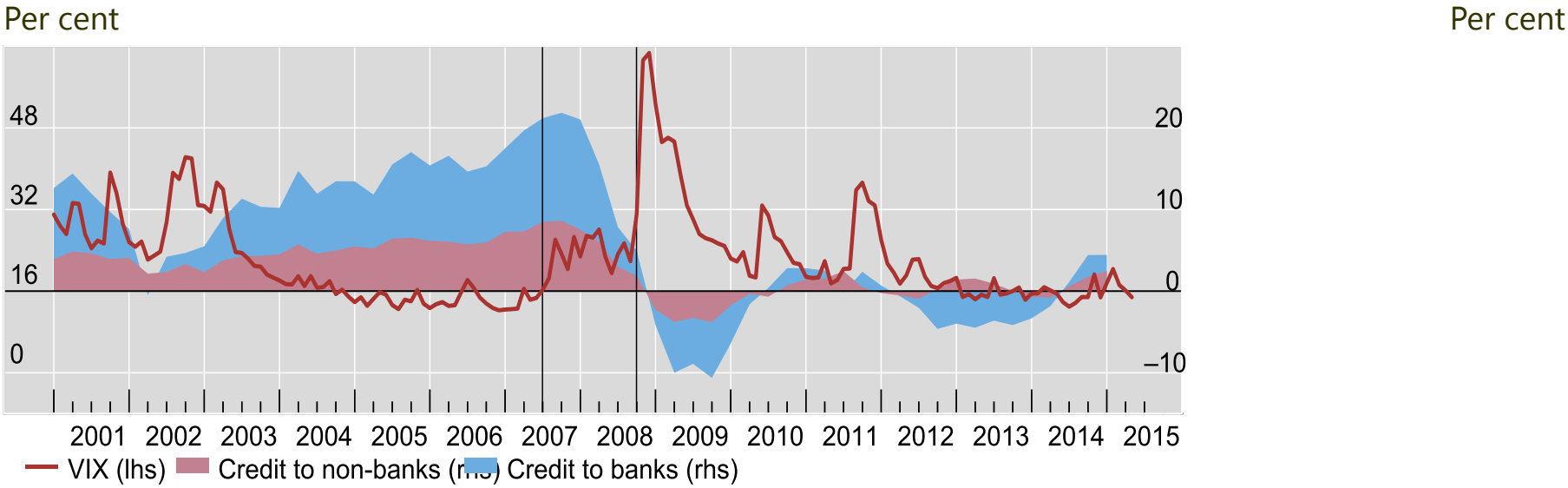
Helsinki, 3 July 2015

*Views expressed here are mine, not necessarily those of the BIS

Direct and intermediated finance



Year-on-year rate of growth in international bank claims[1]



The vertical lines indicate: 2000 Nasdaq peak; 2007 beginning of global financial crisis; 2008 collapse of Lehman Brothers.

[1] Includes all BIS reporting banks' cross-border credit and local credit in foreign currency.

Sources: Bloomberg; BIS locational banking statistics by residence.

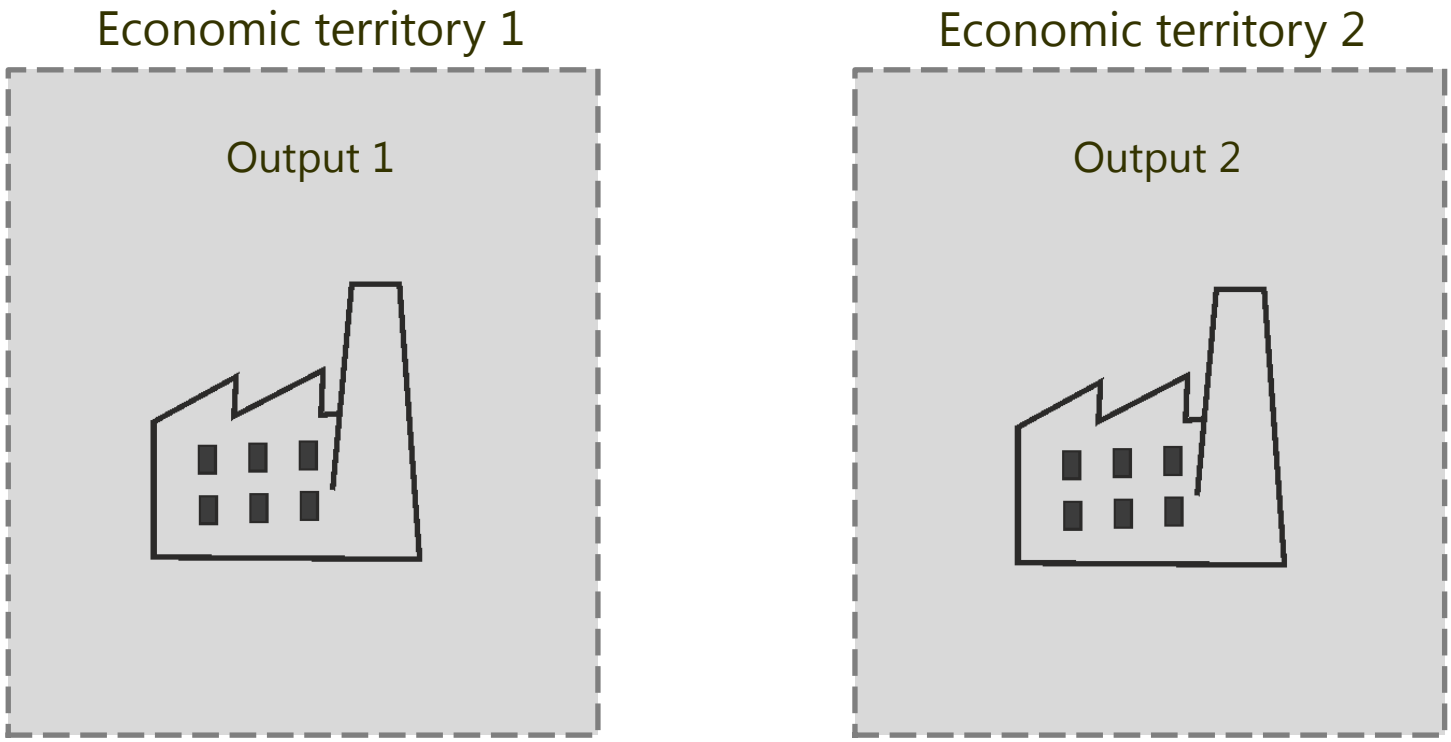
Direct and intermediated finance: two phases

- Banking sector-led credit growth (2003–2008)
  - Cross-border banking
  - Wholesale funding as marginal source of finance
- Bond market-led credit growth (2010–)
  - Search for yield by long-term investors as creditors
  - Focus on corporate borrowers, especially EME corporates

- US dollar as unit of account in debt contracts
  - Borrowers borrow in dollars, lenders lend in dollars, irrespective of whether the borrower or lender is located in the United States

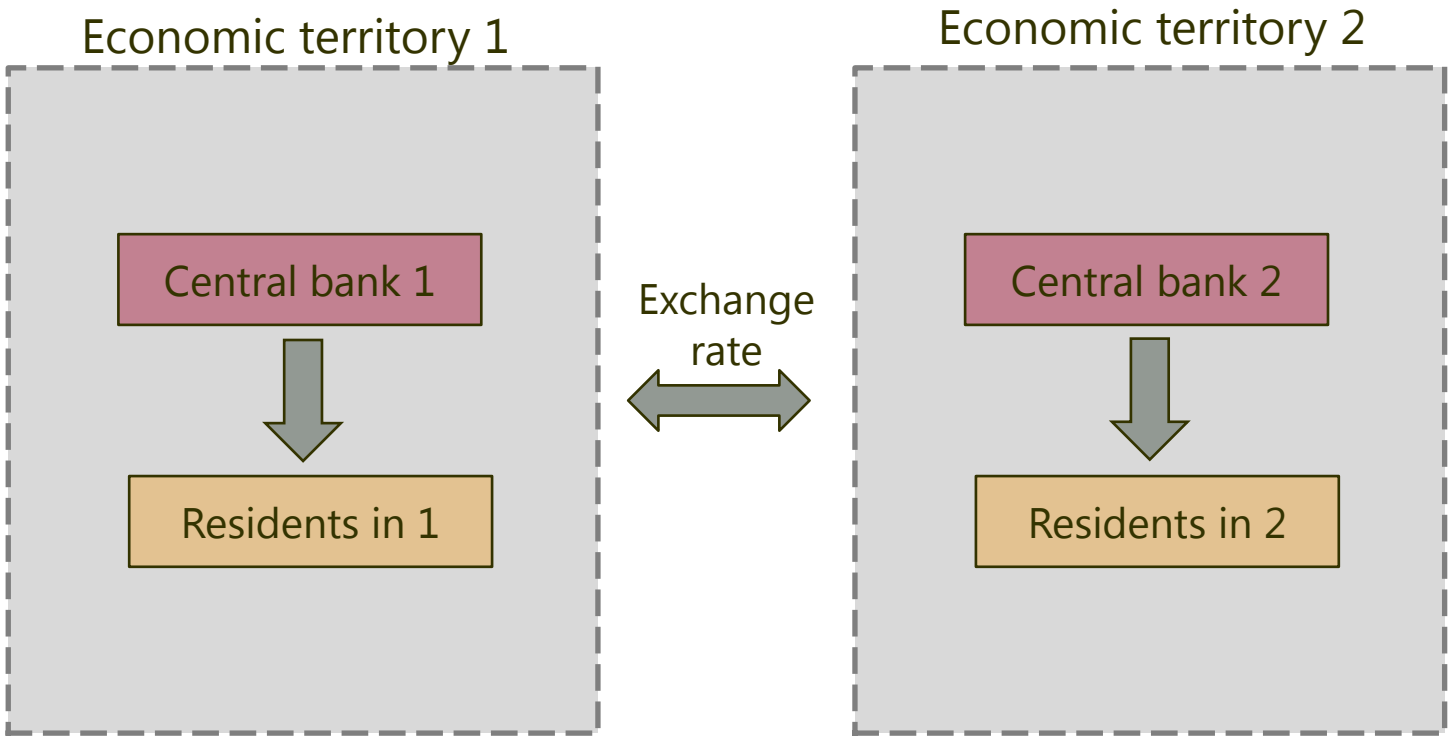
Textbook framework for international finance

Unit of analysis is national income (balance of payments) area



Textbook framework for international finance

Floating exchange rates allow monetary policy autonomy



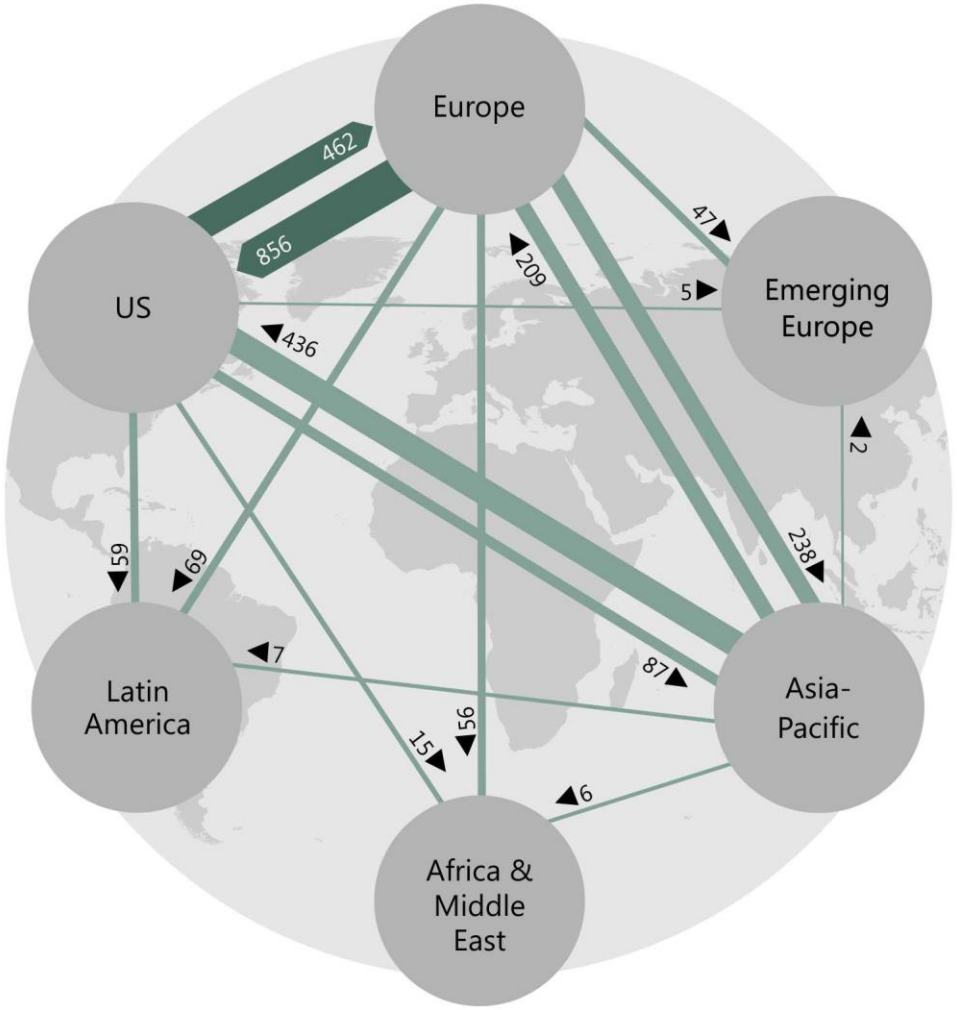
BANK FOR INTERNATIONAL SETTLEMENTS

The US dollar and the waxing and waning of cross-border banking

US dollar-denominated cross-border bank claims

In USD billions

2002

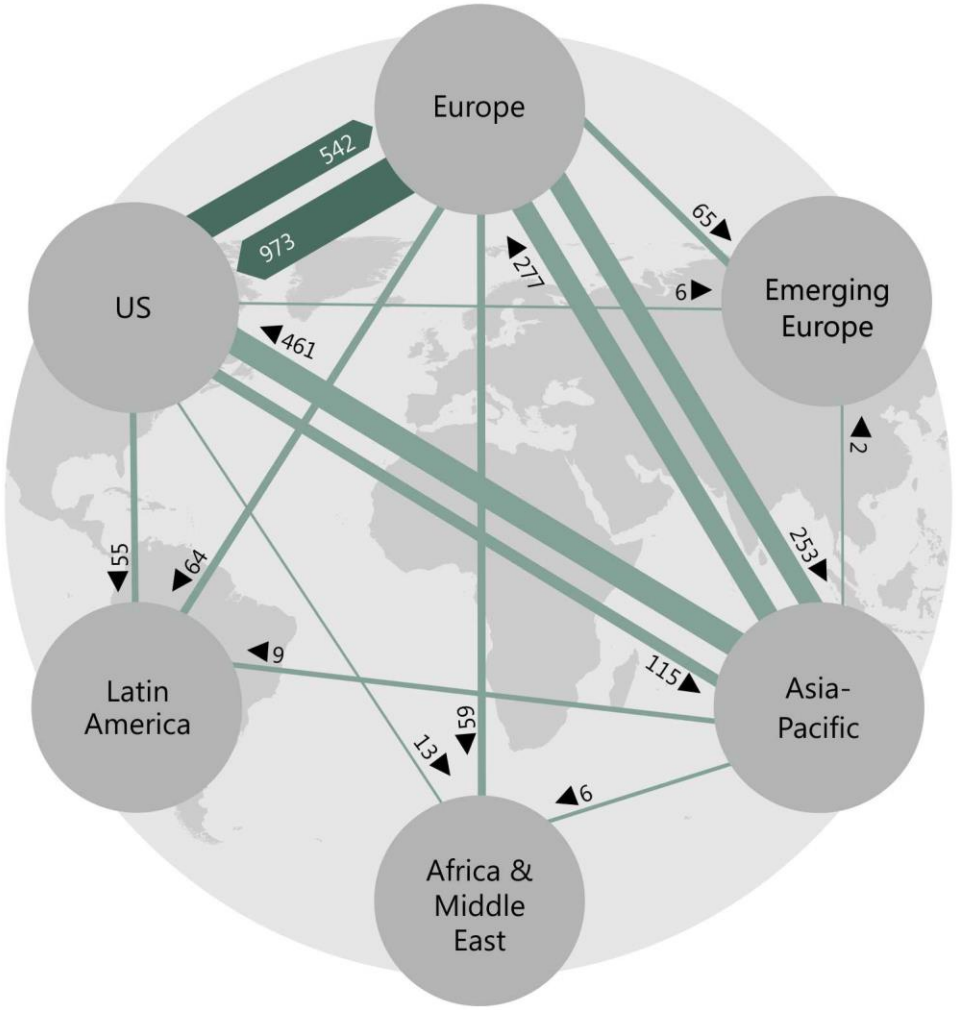


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2003

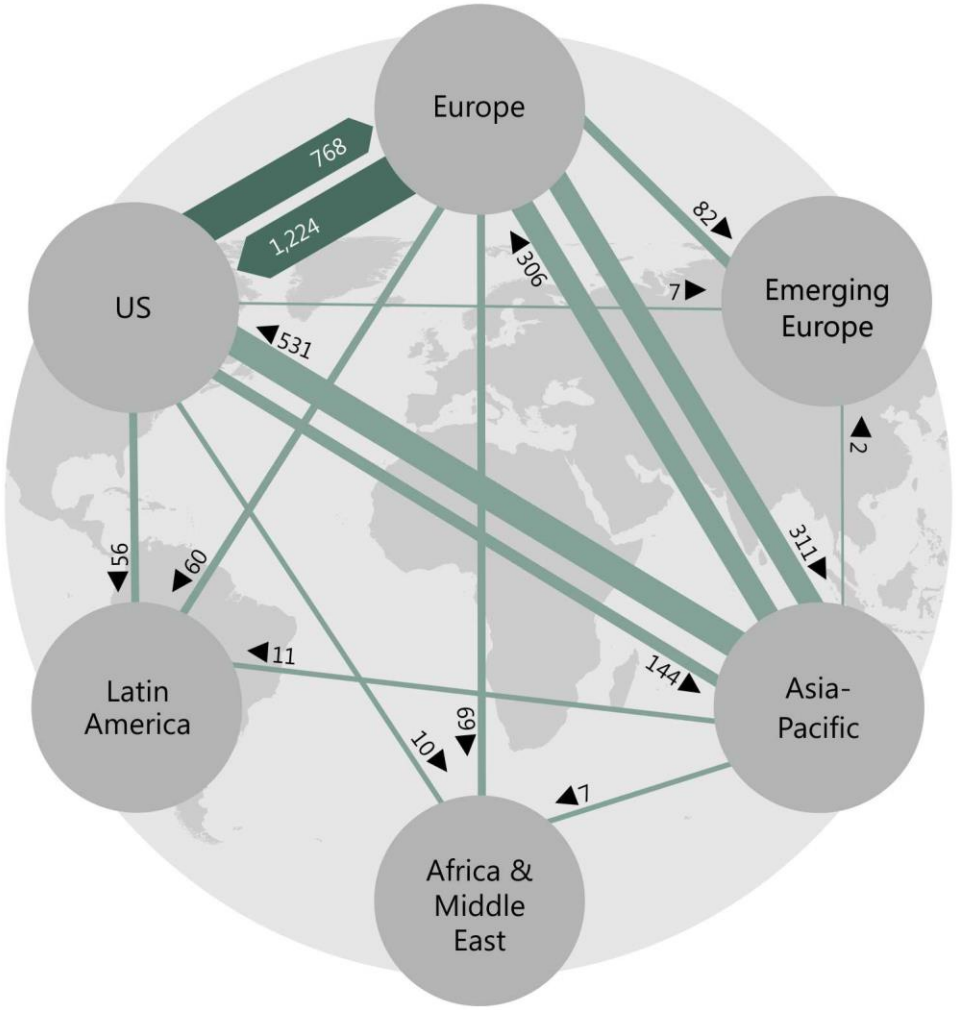


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2004

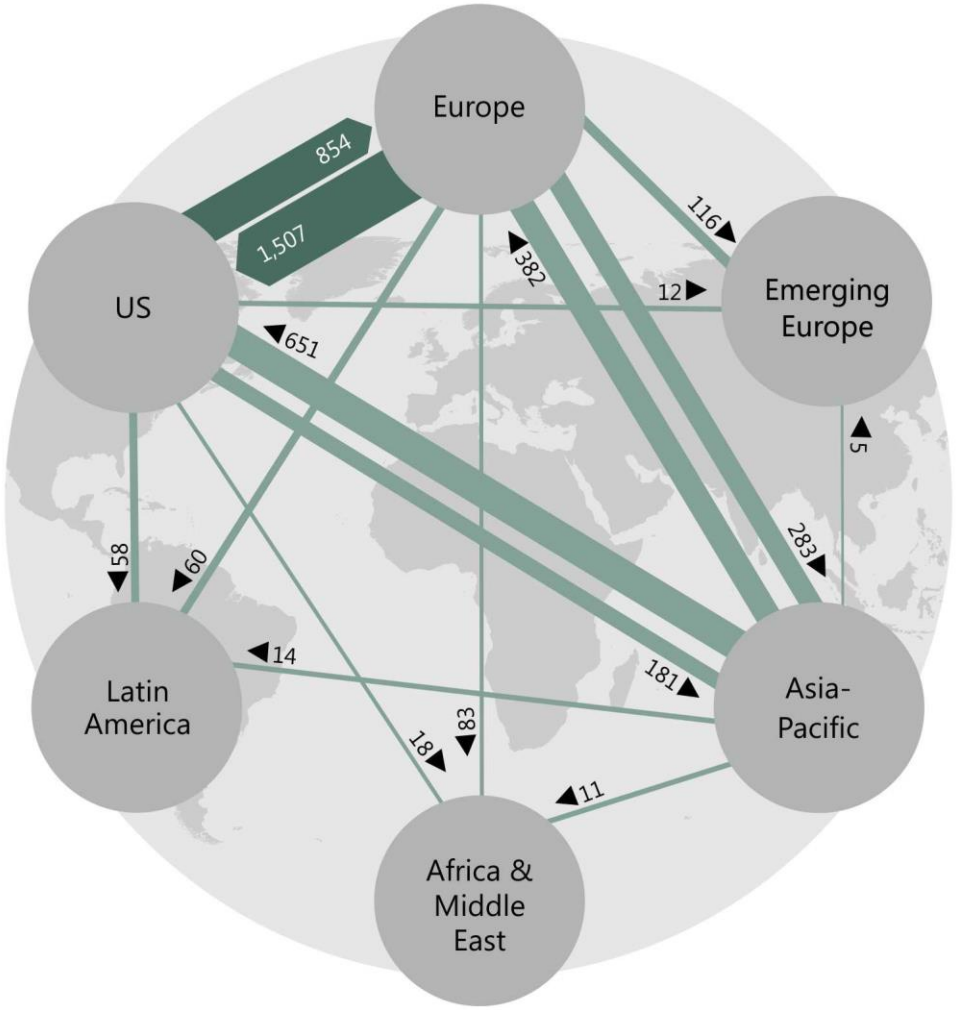


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2005

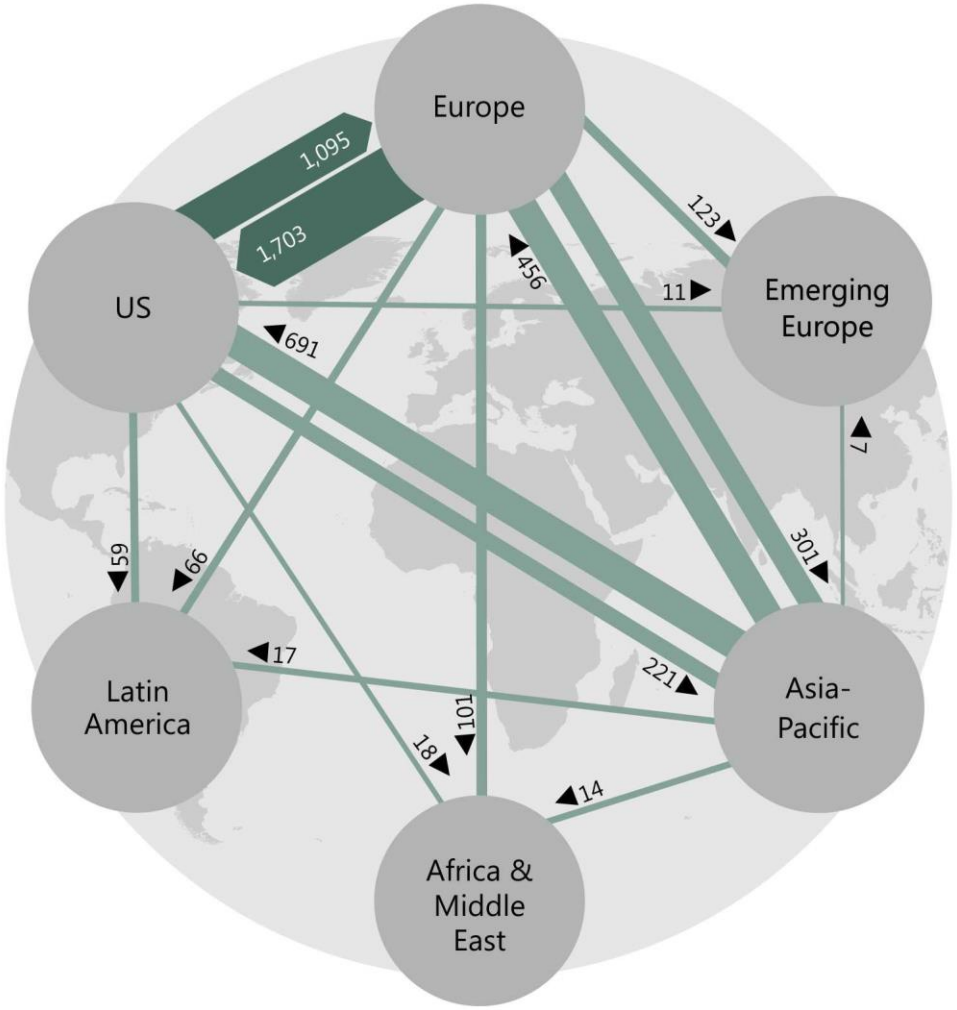


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2006

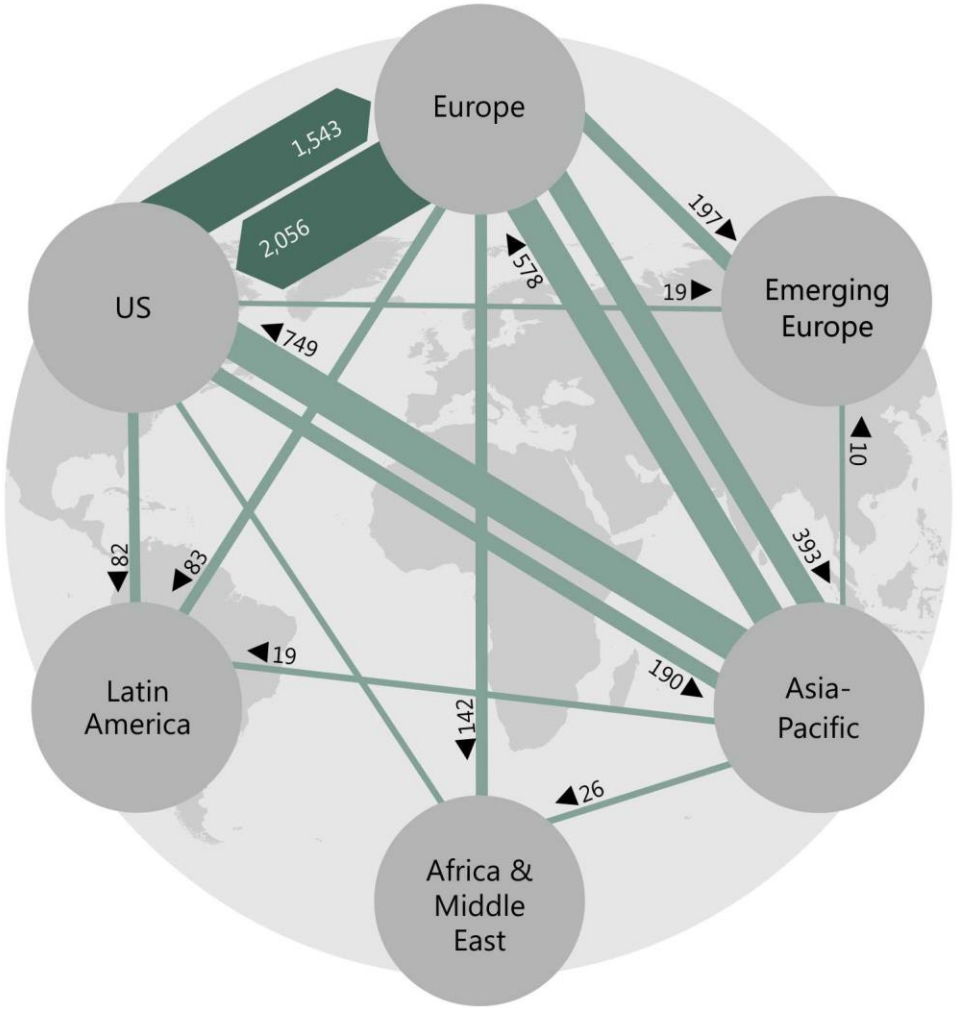


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2007

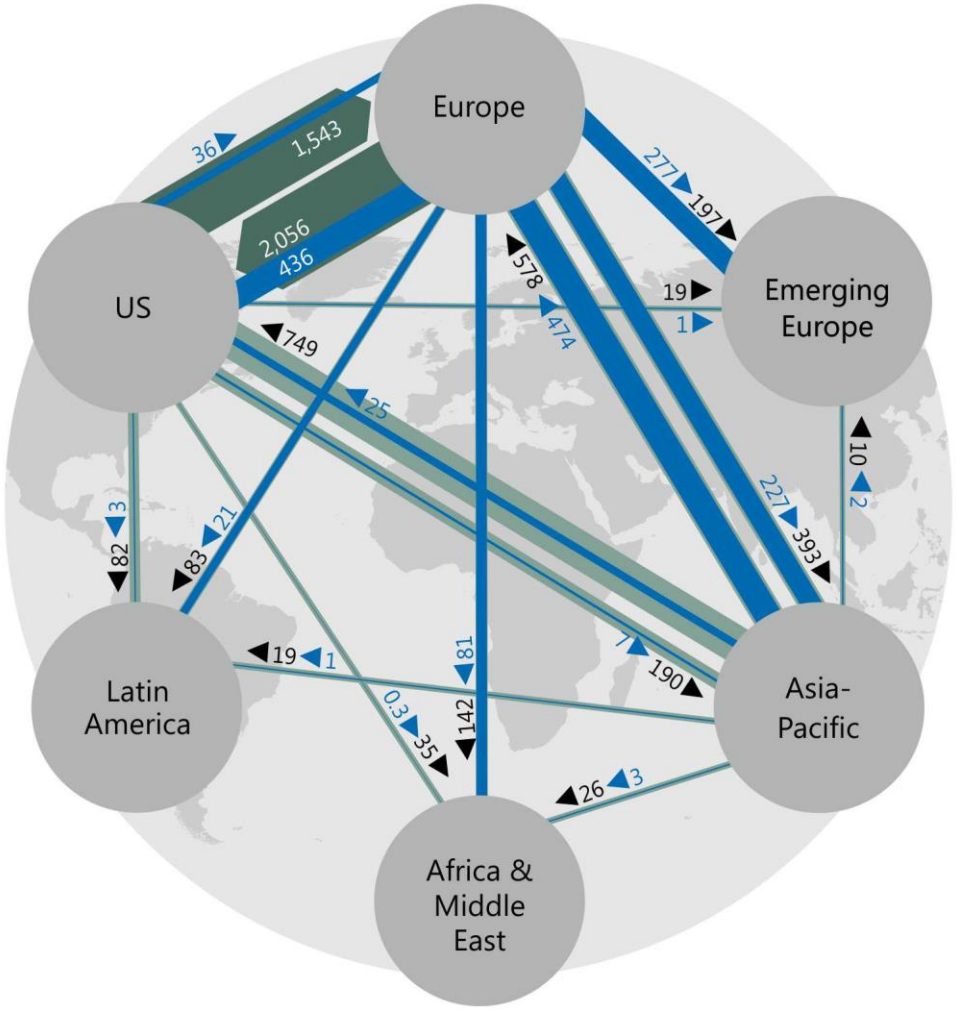


Source: BIS locational banking statistics by residence.

US dollar- and euro-denominated cross-border bank claims

In USD billions

2007



Source: BIS locational banking statistics by residence.

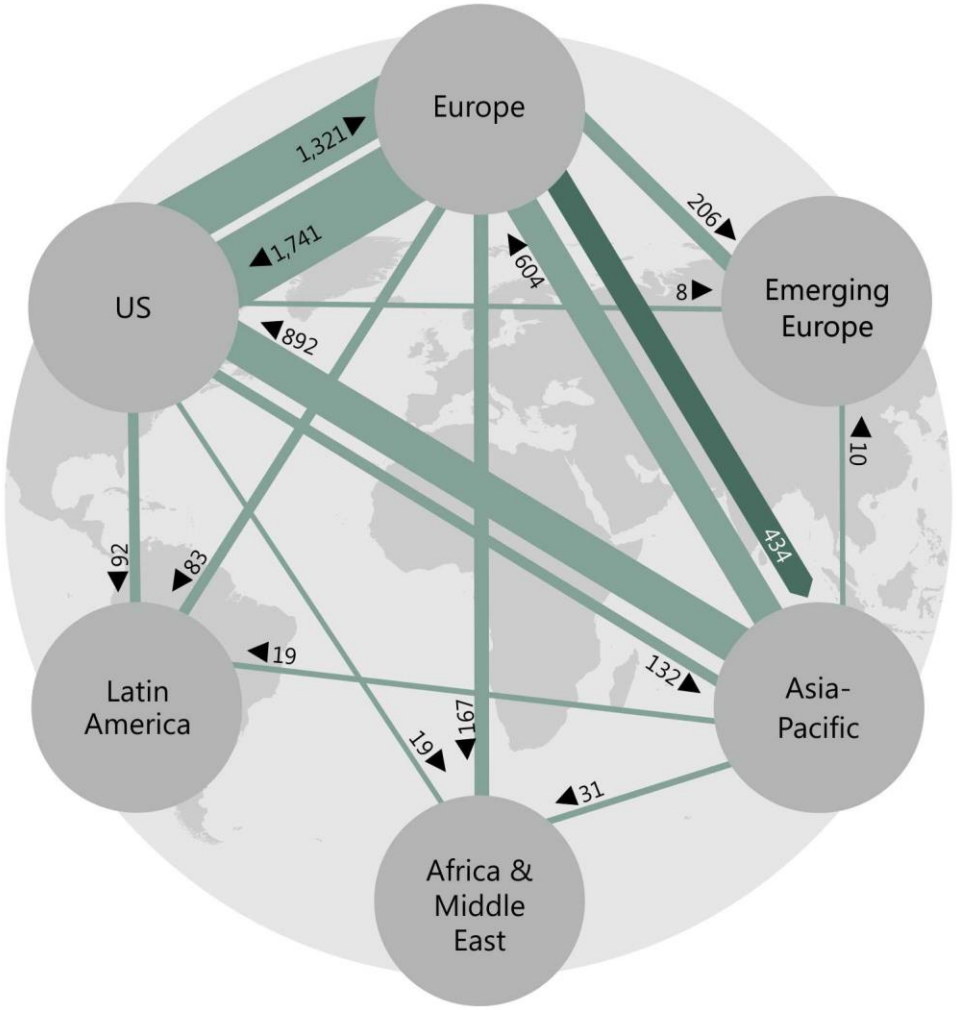
US dollar cross-border bank lending: 2002–07

- Increase of $3.6 trillion between 2002 and 2007
  - Two thirds of increase ($2.3 trillion) due to US-Europe nexus
  - US-based banks account for only 35% of total increase in US dollar cross-border bank lending
- European banks intermediating US dollar funding
  - At end-2007, European banks had twice the dollar claims on Asian borrowers as US-based banks ($393 bn vs $190 bn)

US dollar-denominated cross-border bank claims

In USD billions

2008

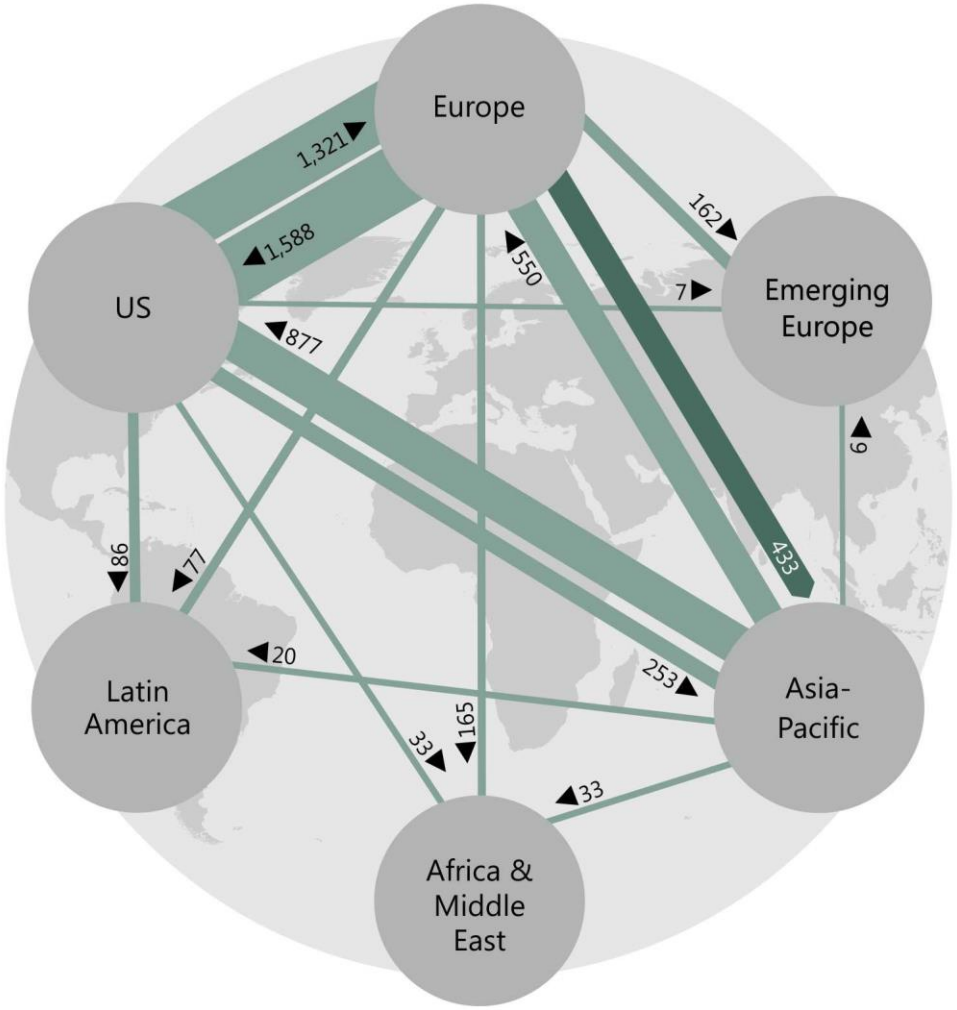


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2009

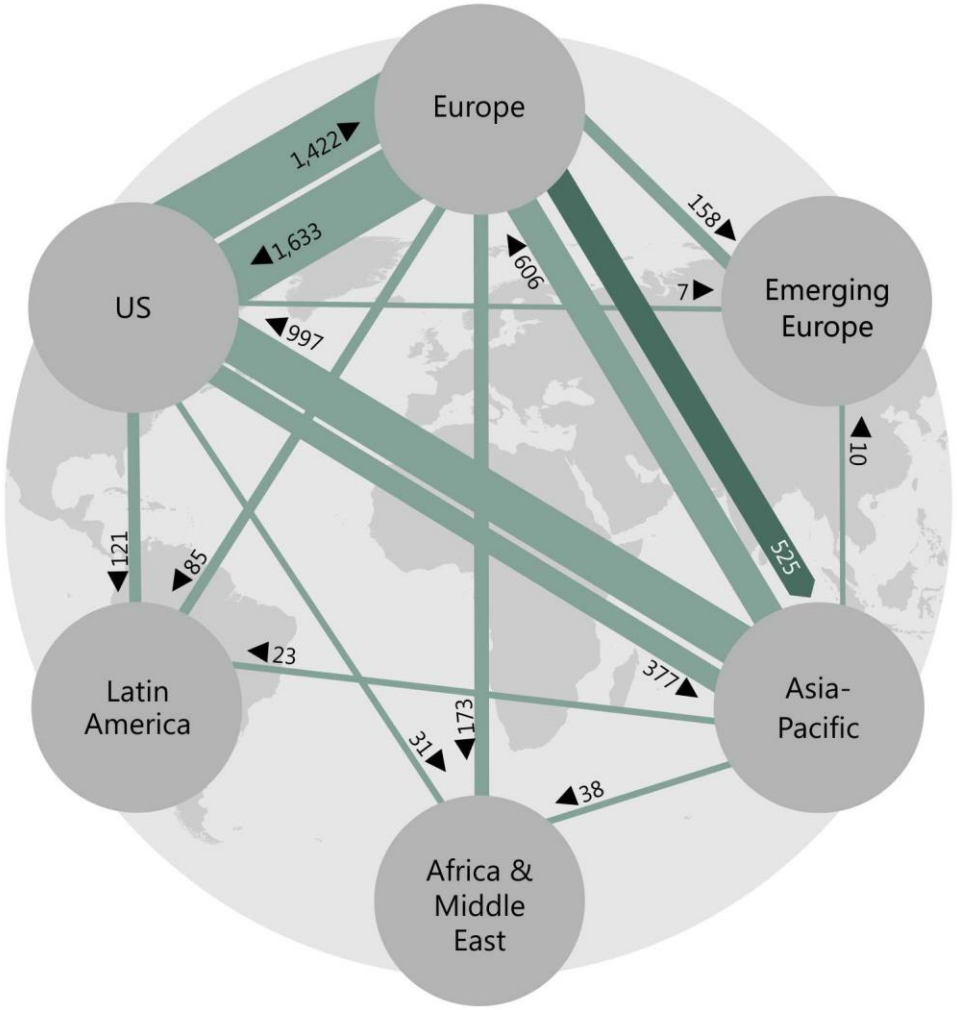


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2010

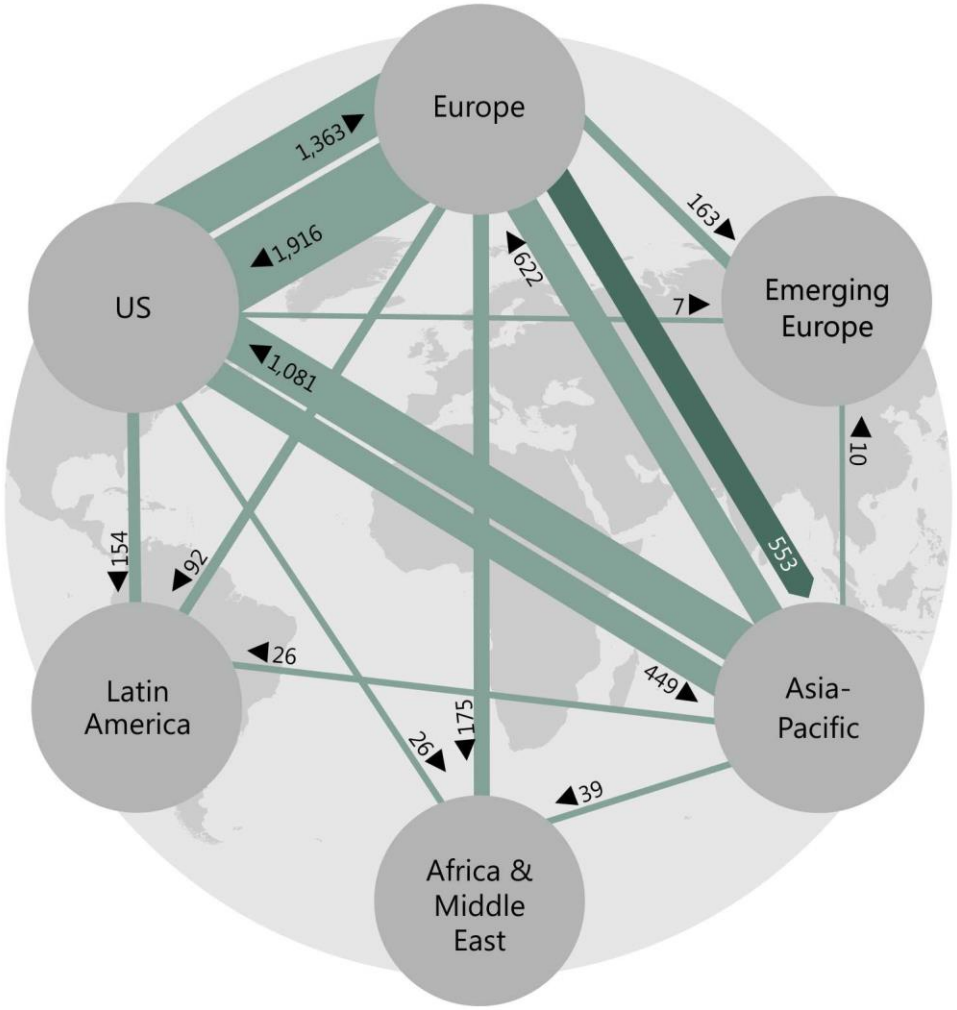


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2011

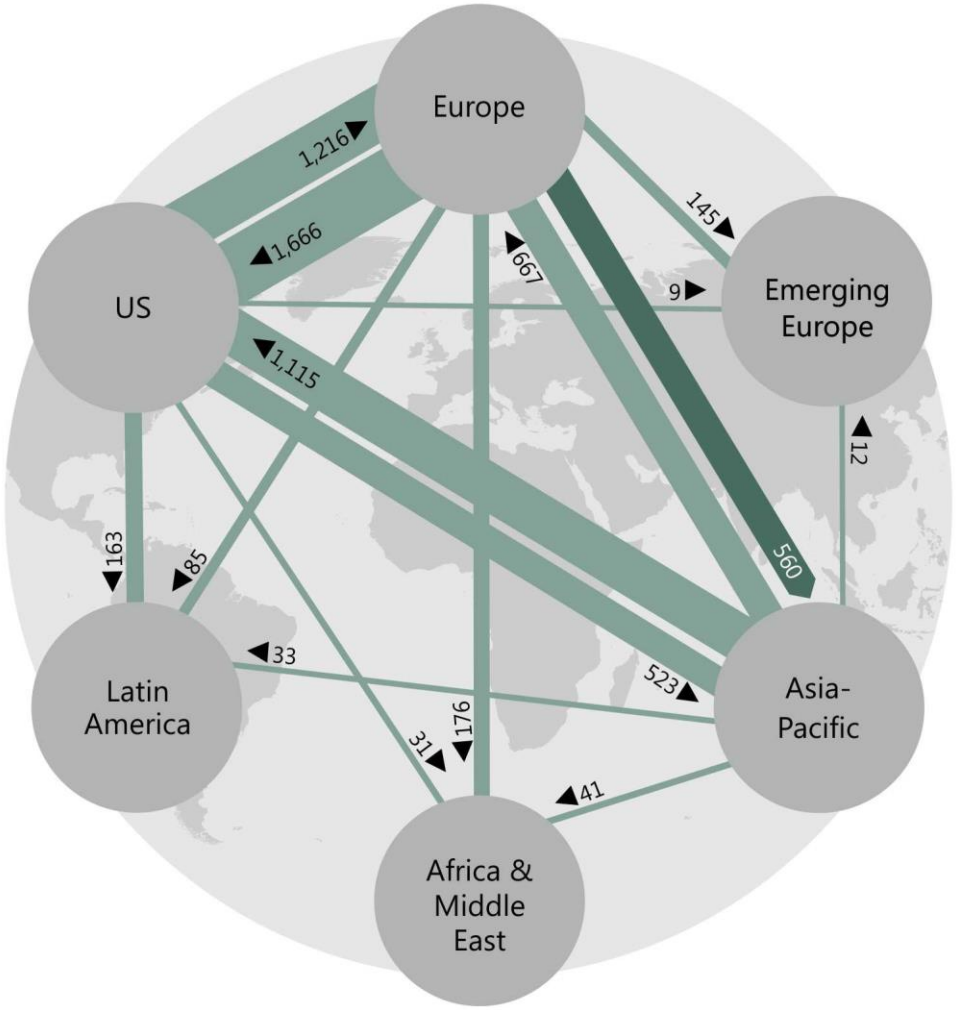


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2012

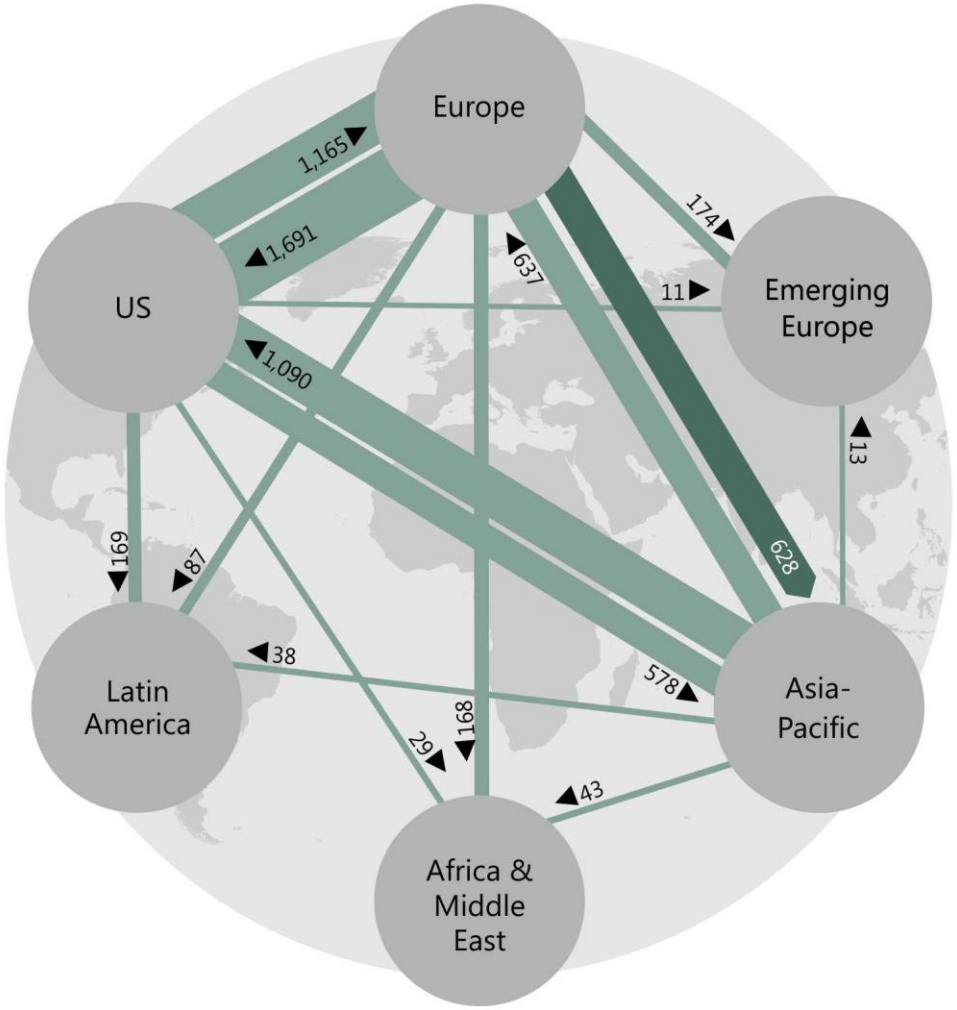


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2013

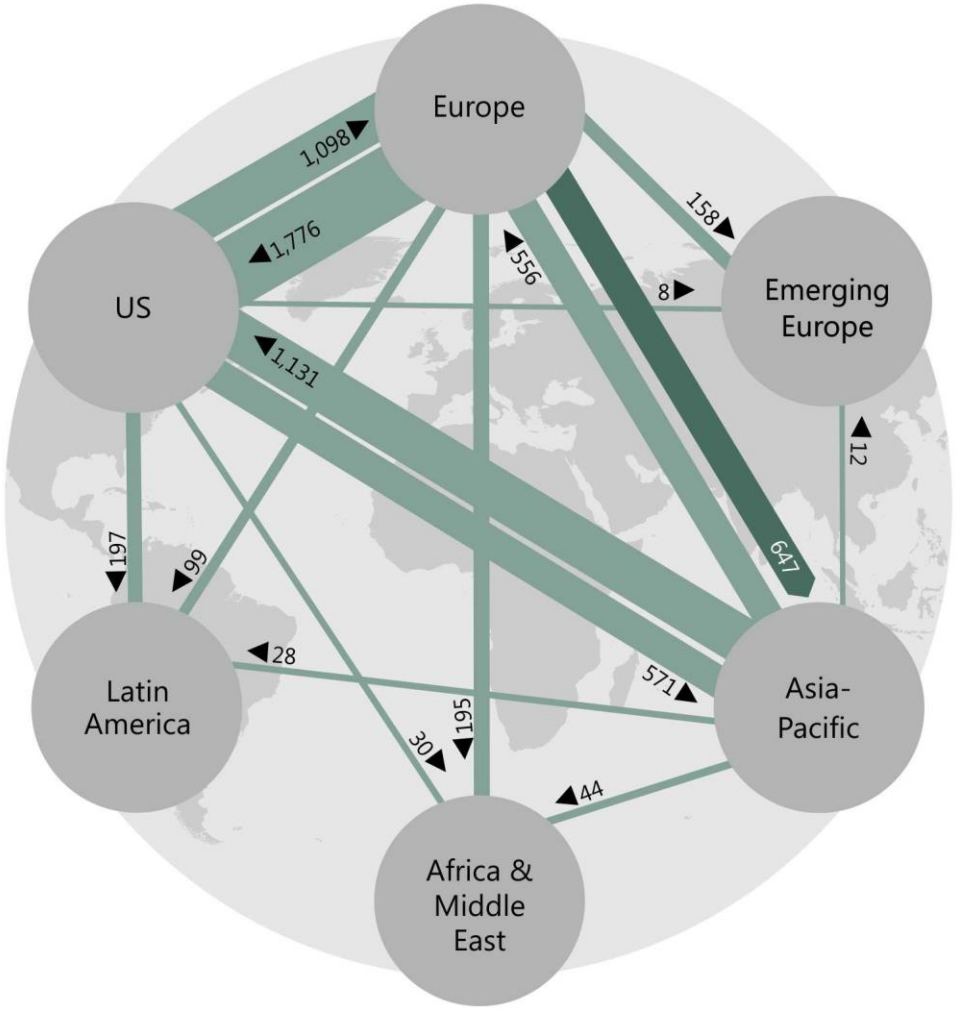


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2014

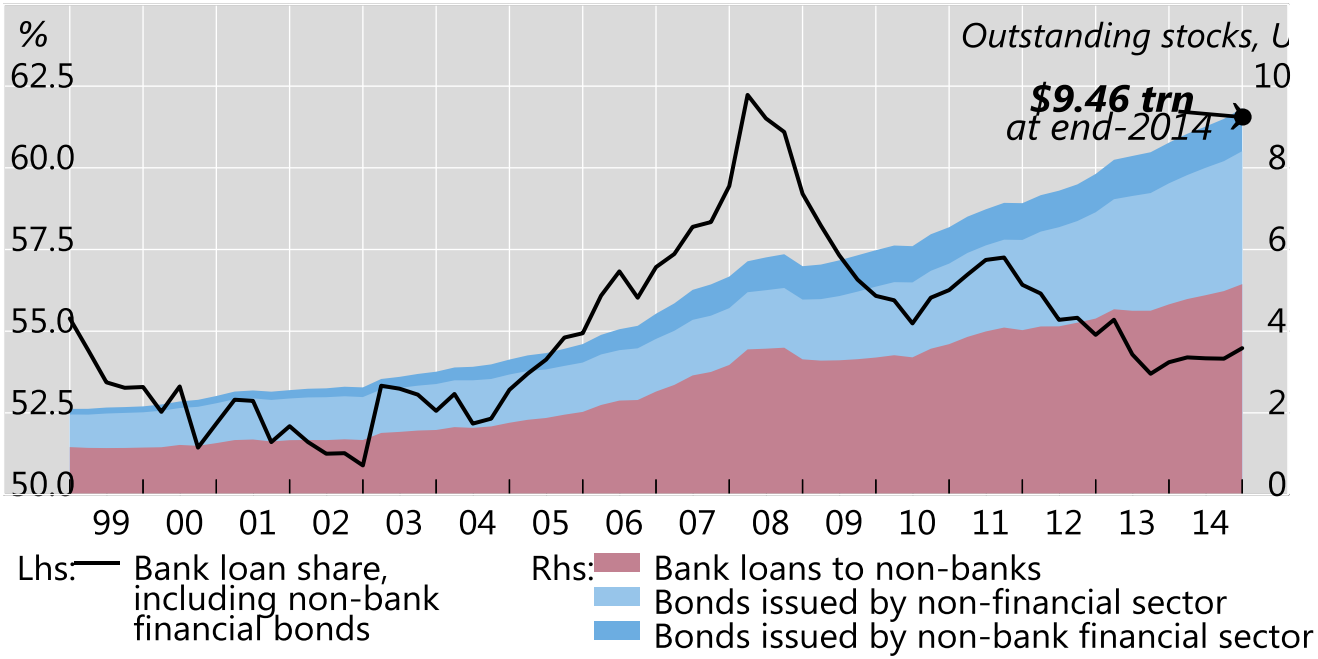


Source: BIS locational banking statistics by residence.

BANK FOR INTERNATIONAL SETTLEMENTS

Currency denomination does not follow the national income boundary: the case of non-banks

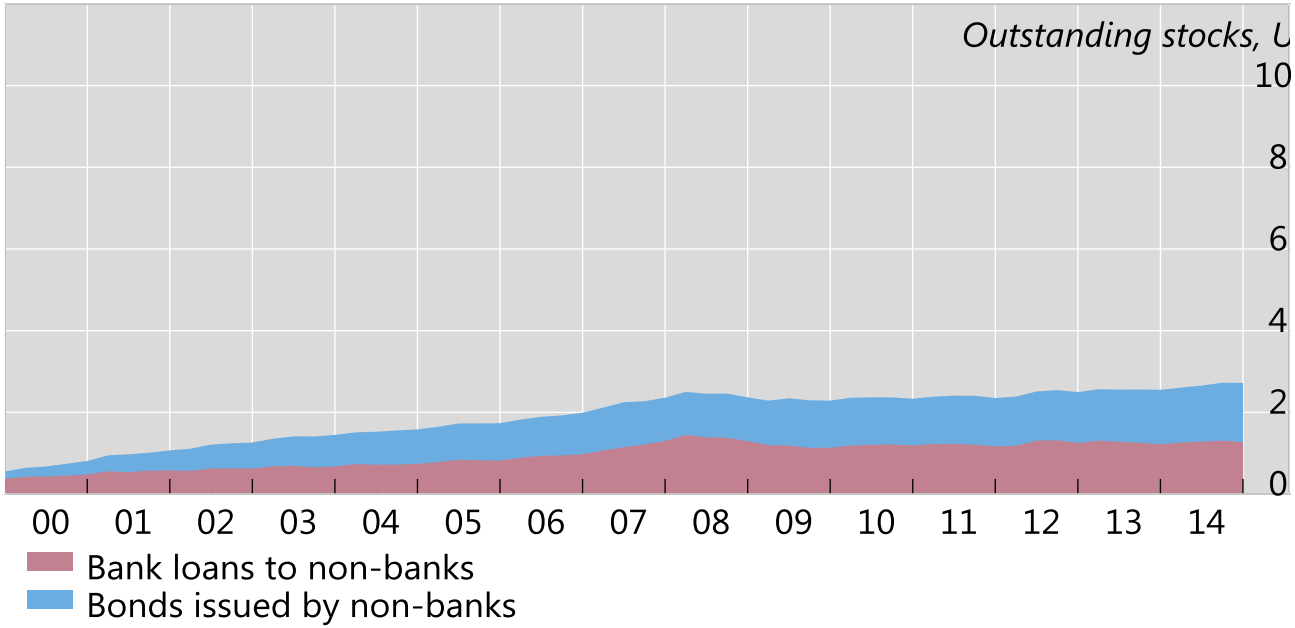
US dollar credit to non-banks outside the United States



Bank loans include cross-border and locally extended loans to non-banks outside the United States. For China and Hong Kong SAR, locally extended loans are derived from national data on total local lending in foreign currencies on the assumption that 80% are denominated in US dollars. For other non-BIS reporting countries, local US dollar loans to non-banks are proxied by all BIS reporting banks' gross cross-border US dollar loans to banks in the country. Bonds issued by US national non-bank financial sector entities resident in the Cayman Islands have been excluded.

Sources: IMF, *International Financial Statistics*; Datastream; BIS international debt statistics and locational banking statistics by residence; BIS calculations.

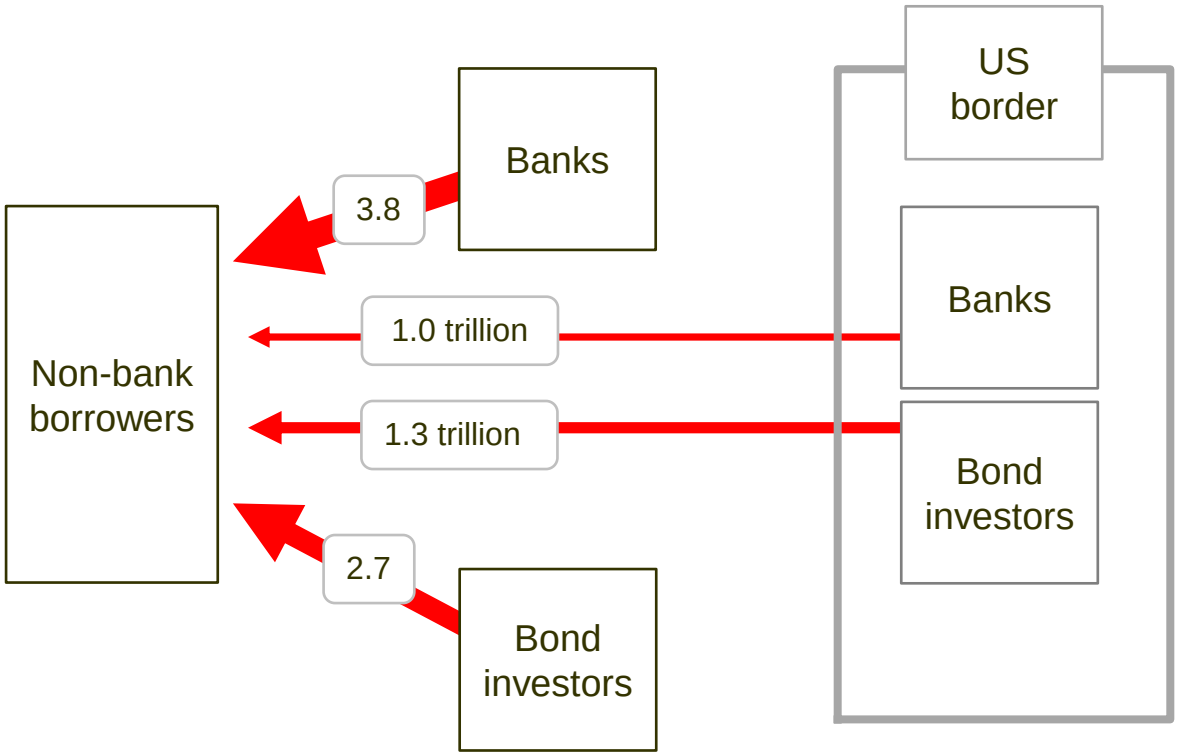
Equivalent euro-denominated debt is a quarter of the size



Bank loans include cross-border and locally extended loans to non-banks outside the euro area. For China and Hong Kong SAR, locally extended loans are derived from national data on total local lending in foreign currencies on the assumption that 20% are denominated in euros. For other non-BIS reporting countries, local euro loans to non-banks are proxied by all BIS reporting banks' gross cross-border euro loans to banks in the country.

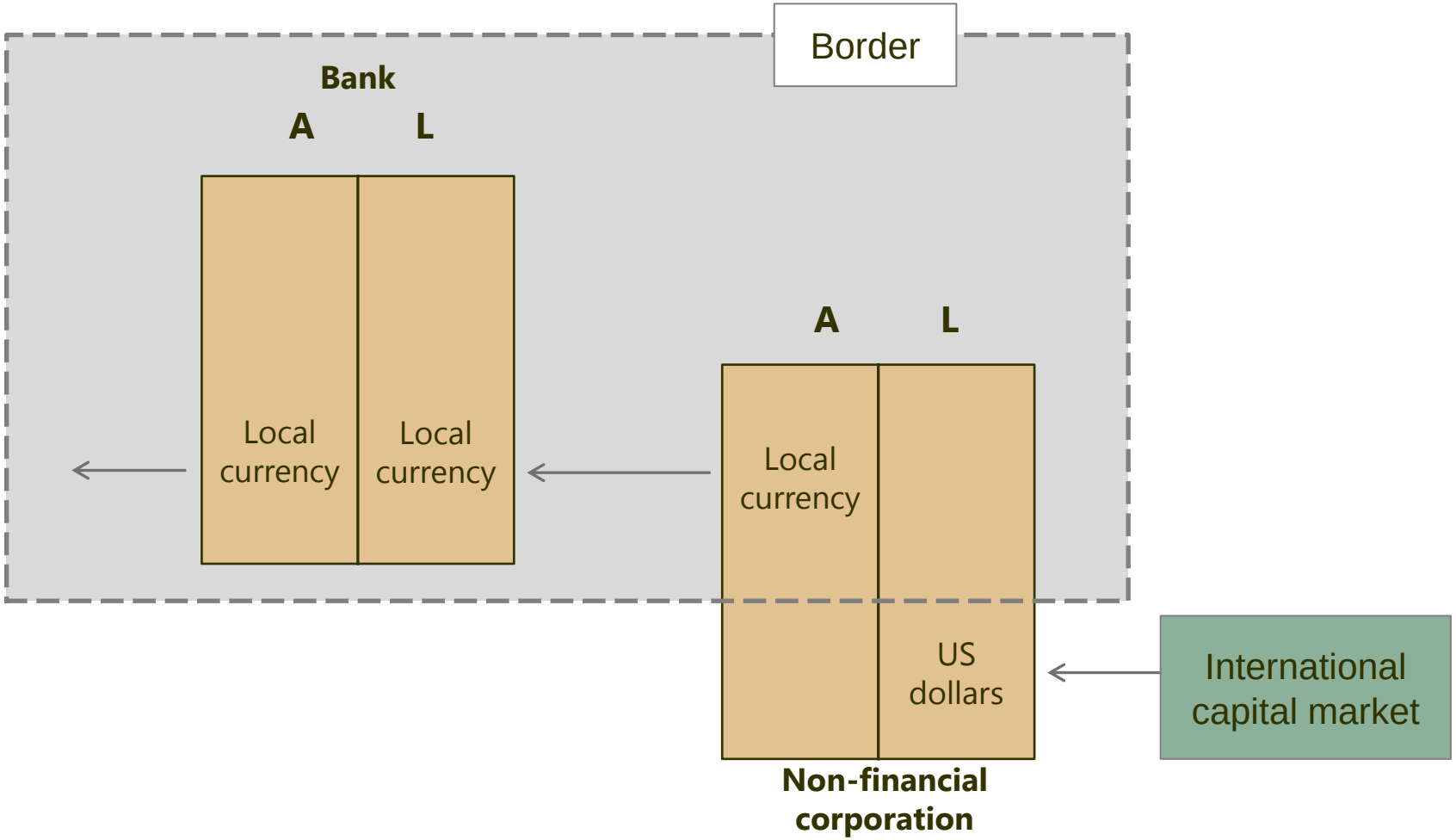
Sources: IMF, *International Financial Statistics*; Datastream; BIS international debt statistics and locational banking statistics by residence; BIS calculations.

US dollar-denominated credit to borrowers outside US



Source: McCauley, McGuire and Sushko (BIS 2014); data as of Dec 2013.

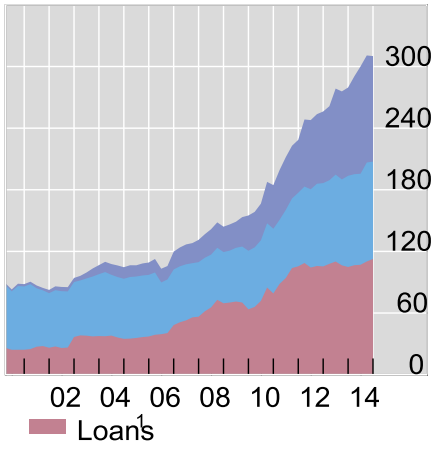
Traditional balance of payments boundary may understate "external" dollar credit



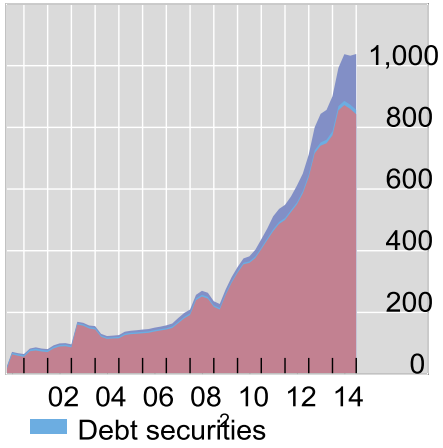
US dollar credit to non-bank borrowers including offshore issuance

In billions of US dollars

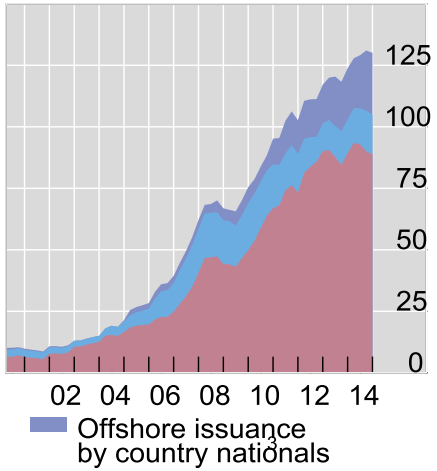
Brazil



China



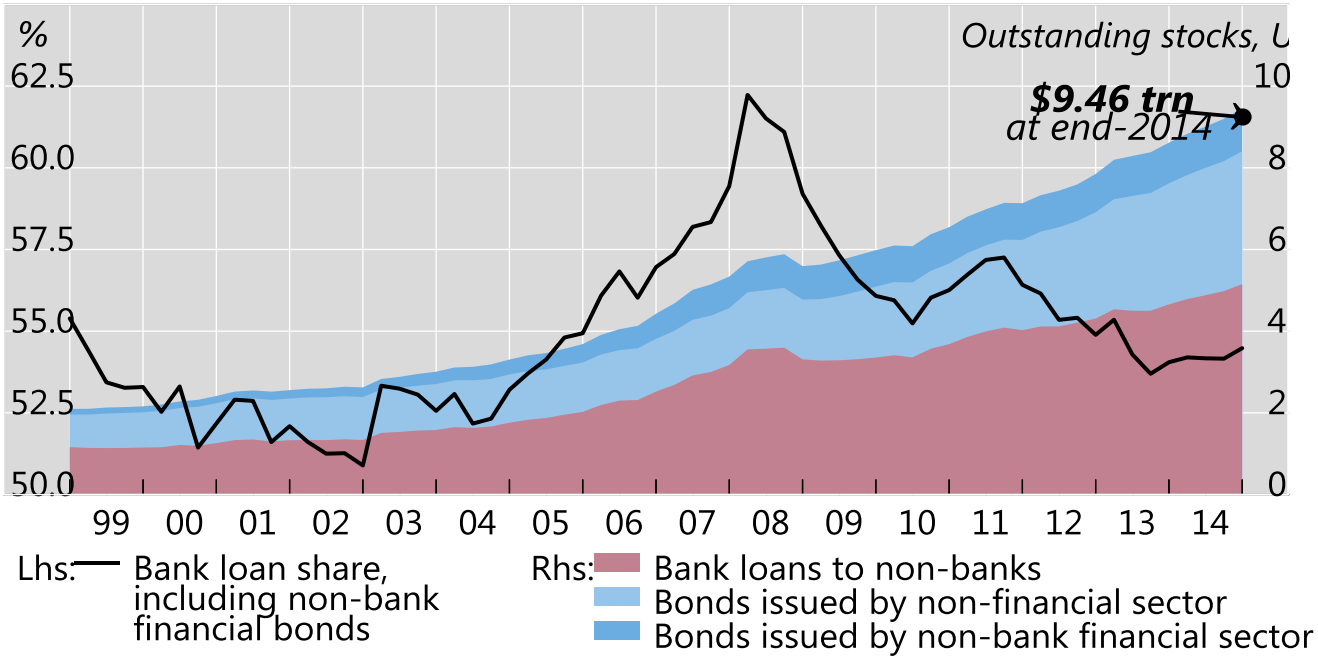
India



[1] US dollar-denominated loans to non-bank residents of the country listed in the panel titles. For China, locally extended US dollar loans are estimated from national data on total foreign currency loans, assuming 80% are dollar-denominated. [2] Outstanding US dollar debt securities issued by non-financial residents of the country listed in the panel title. [3] Outstanding US dollar-denominated bonds issued offshore (ie outside the country listed in the panel title) by non-financials with the nationality listed in the panel title.

Sources: BIS locational banking statistics by residency; BIS International Debt Securities Statistics; national sources; authors' calculations.

US dollar credit to non-banks outside the United States



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Sources: IMF, *International Financial Statistics*; Datastream; BIS international debt statistics and locational banking statistics by residence; BIS calculations.

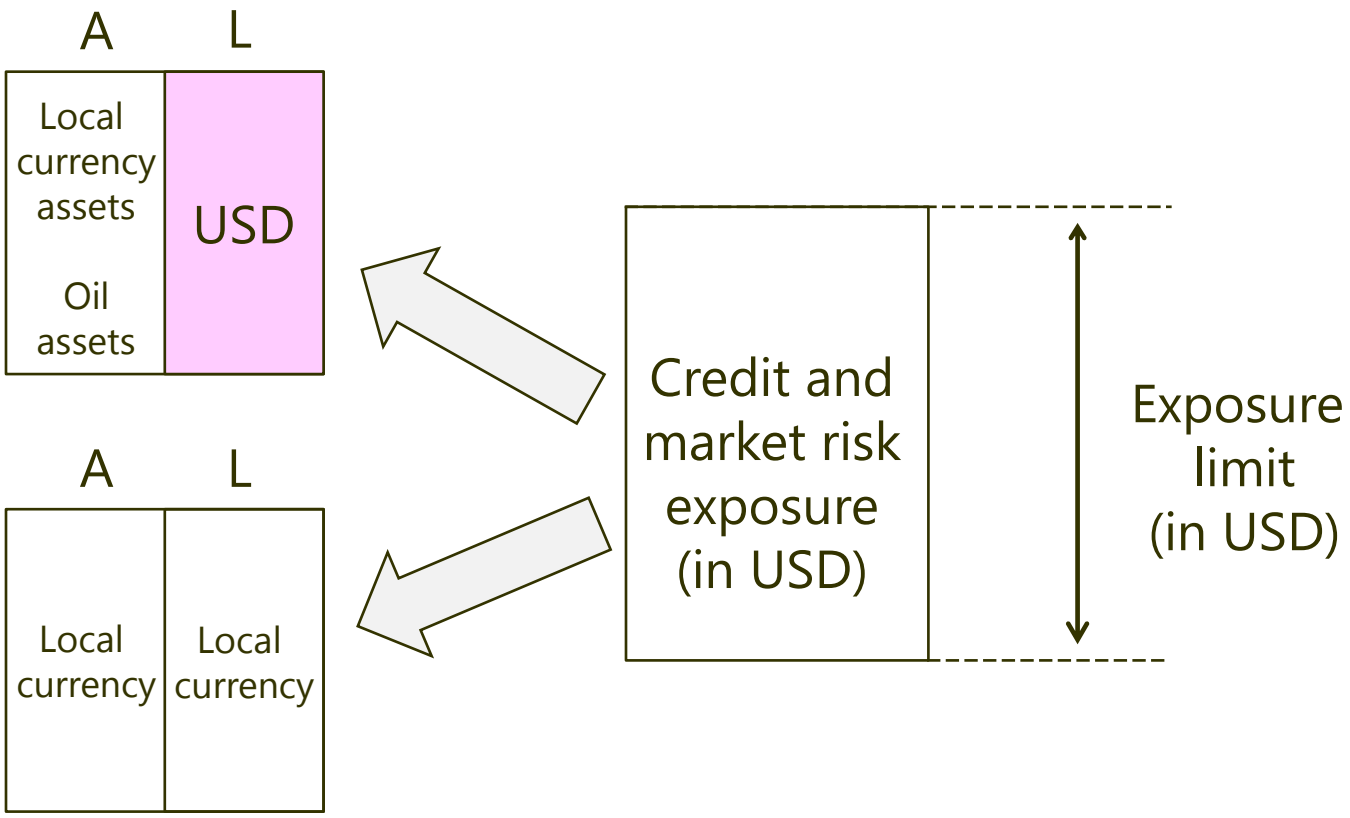
What assets back the 9.5 trillion US dollar debt of non-bank borrowers outside the United States?

- Many have dollar cash flows:
  - Exporters
  - Commodity producers
- Some do not:
  - Property developers
  - Utilities
- Even with dollar cash flows, a strong dollar may lead to strains:
  - Commodity prices negatively correlated with the dollar
  - Credit tightening through the "risk-taking channel"

Risk-taking channel and exchange rates

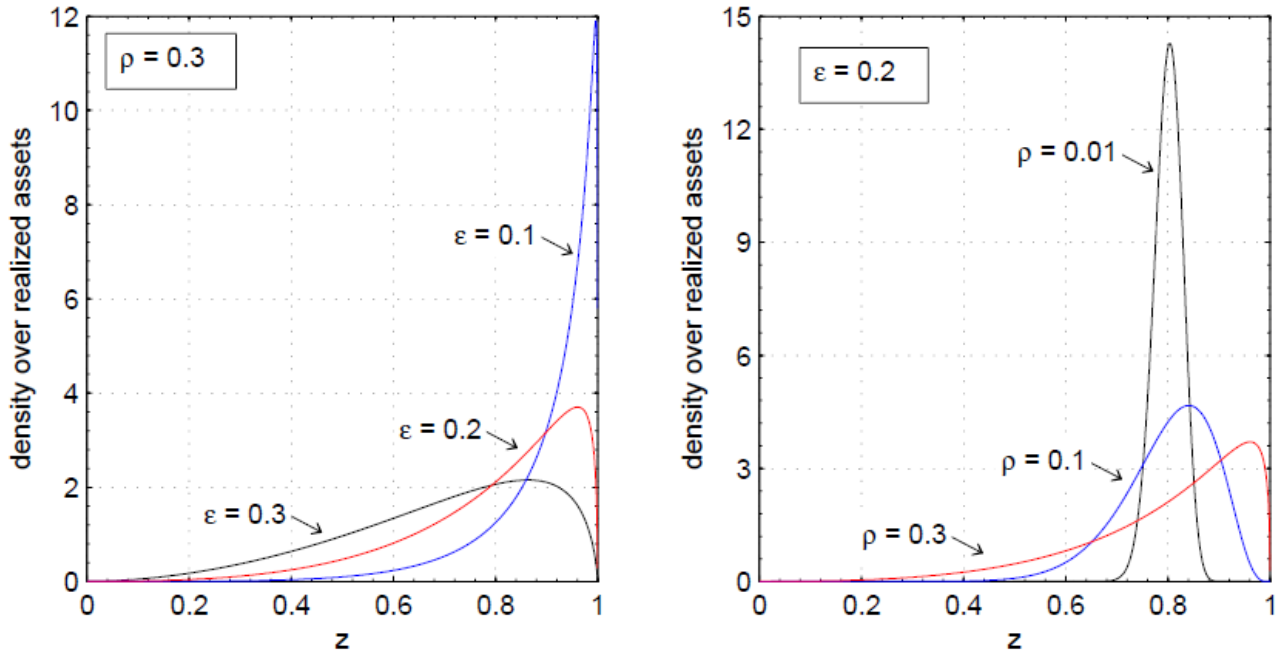
Risk-taking channel and exchange rates

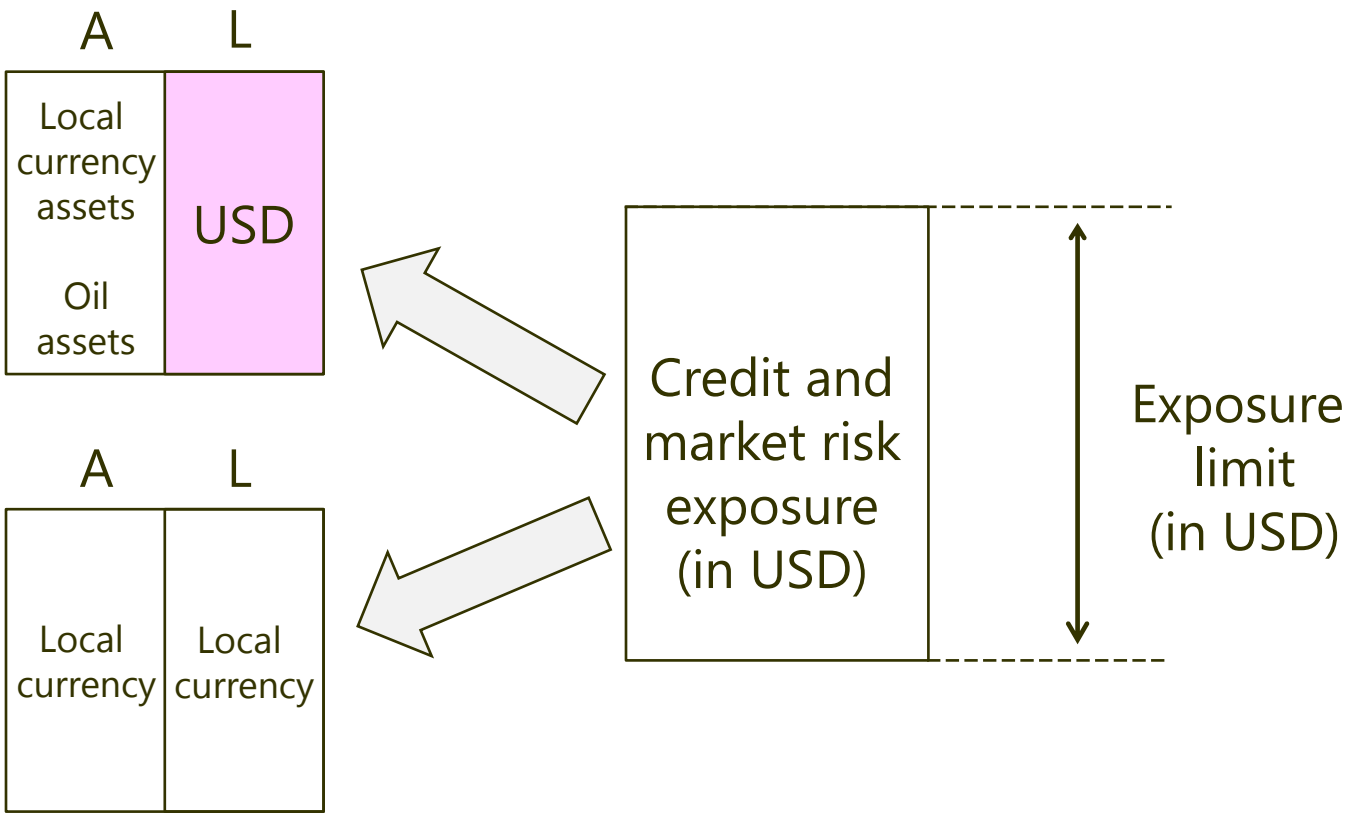
- When the dollar is weak,
  - Some borrower balance sheets look strong
  - perceived credit quality goes up
  - spare lending capacity appears for any given exposure limit
  - credit supply is more plentiful
- When the dollar is strong,
  - Some borrower balance sheets look weaker
  - Perceived credit quality deteriorates
  - Lending capacity falls for any given exposure limit
  - Credit supply tightens



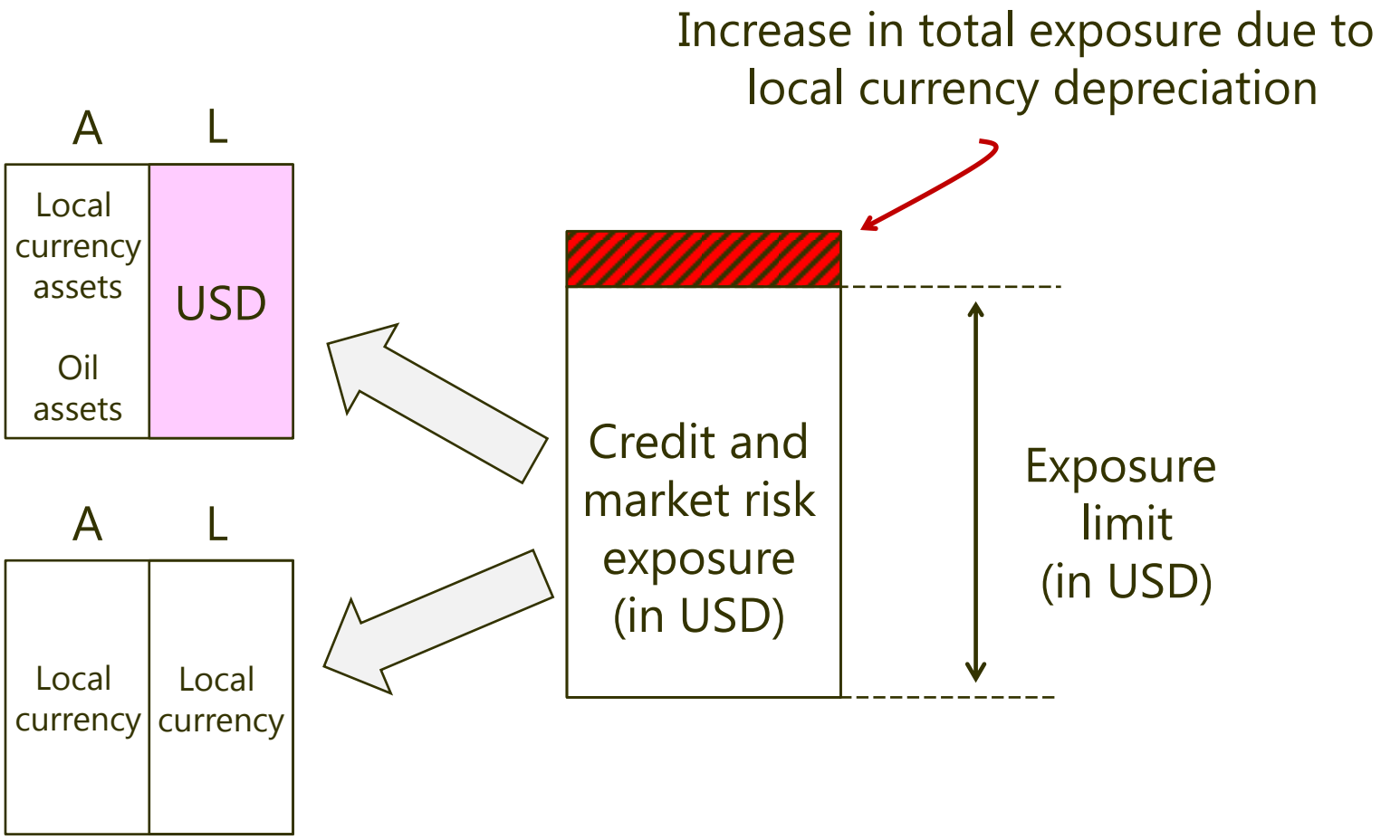
Portfolio consists of USD bonds and local currency bonds

Outcome distributions in the Vasicek model due to shifts in probability of default ε (left-hand panel)

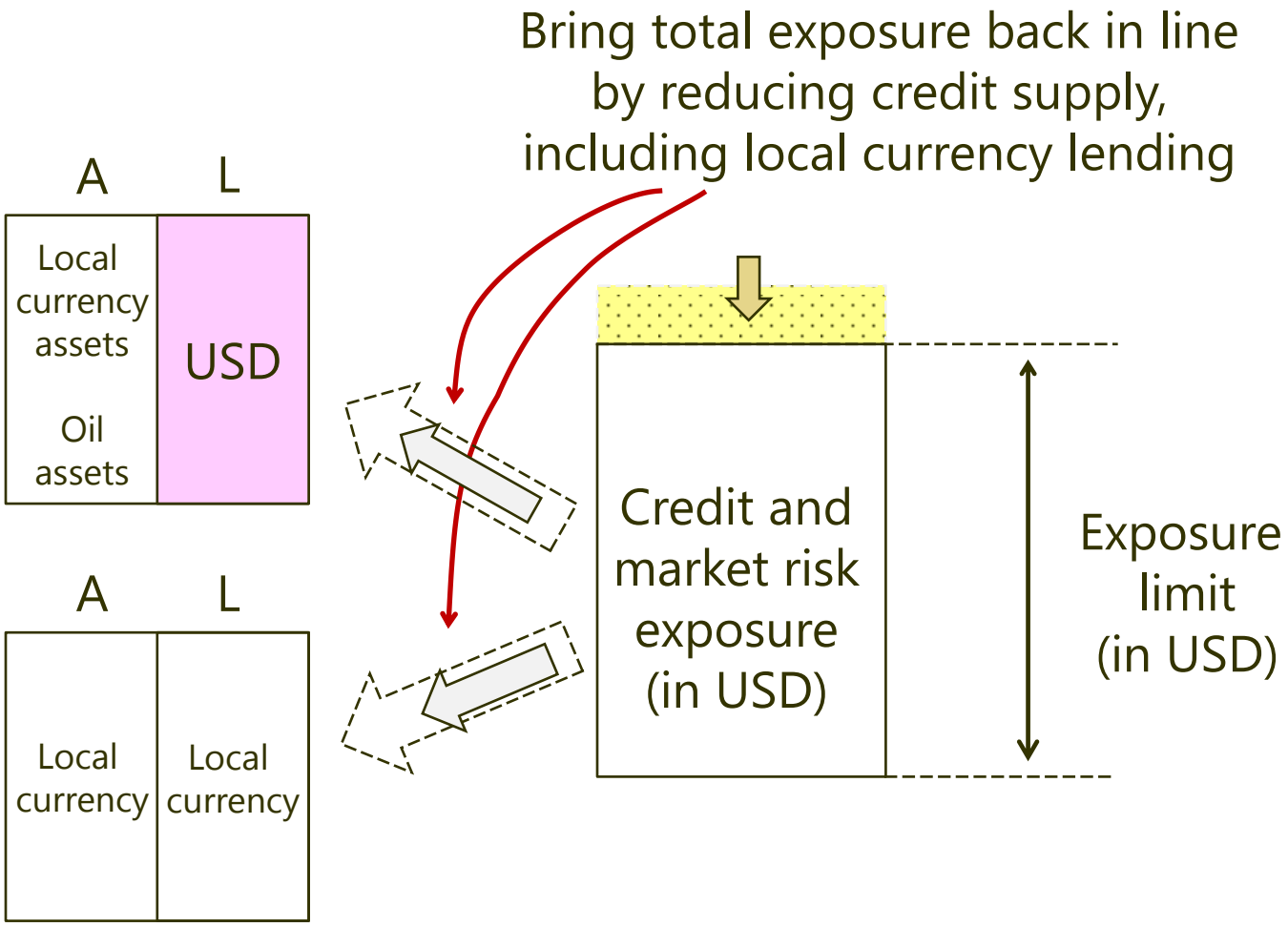




Portfolio consists of USD bonds and local currency bonds



USD appreciation increases credit risk on dollar-denominated bonds. Risk exposure breaches previous exposure limit



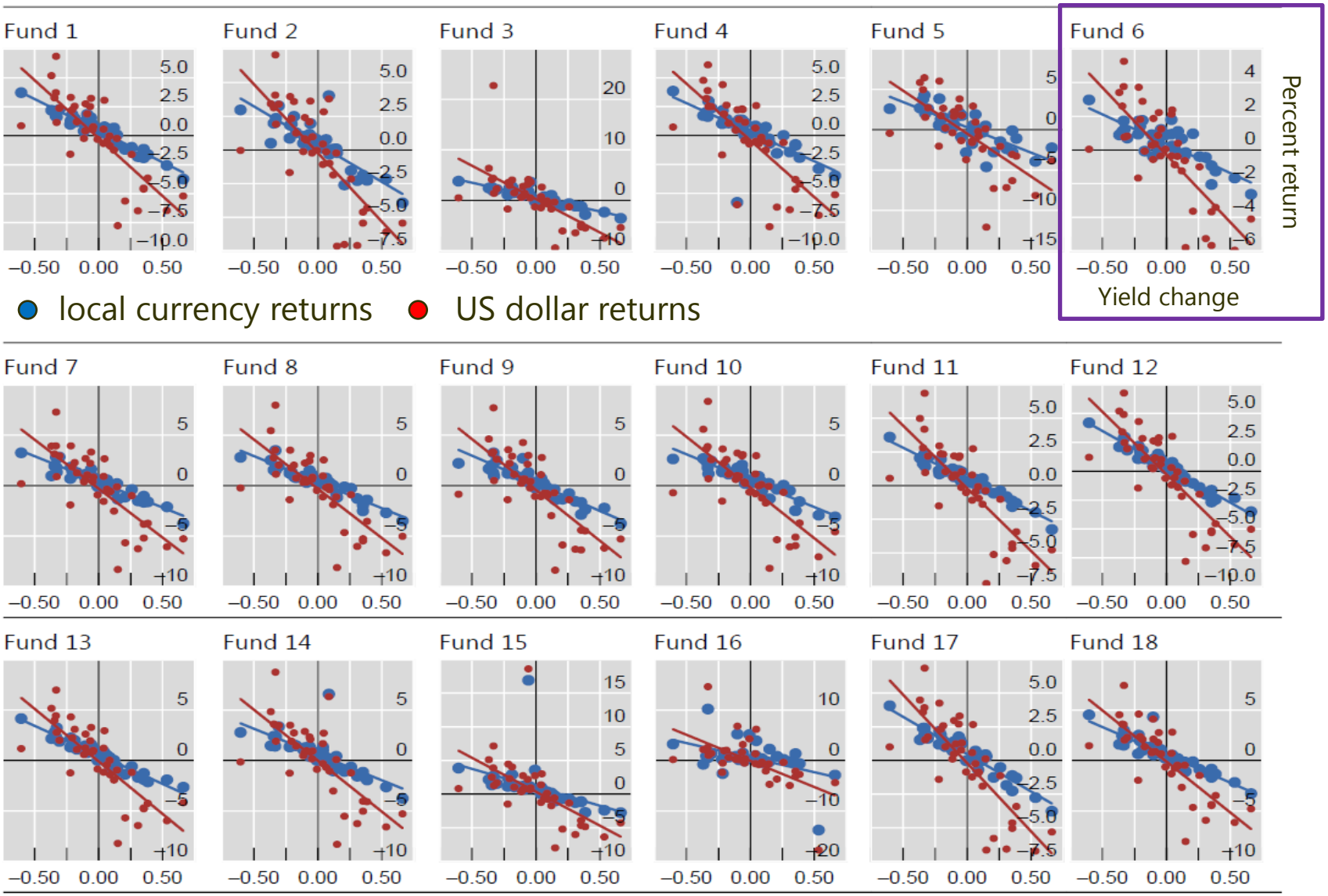
Reference: Bruno V and H S Shin "Cross-border banking and global liquidity" Review of Economic Studies, 82, 535-564 (2015)

Risk-taking channel and exchange rates

- Even borrowers with no currency mismatch will see credit conditions fluctuate with the exchange rate
- It is the bilateral US dollar exchange rate, not the traded-weighted effective exchange rate that matters
- Reason is the outstanding stock of USD debt

Evidence from EME bond mutual funds

Local currency and dollar returns for EME sovereign bond funds



Estimates of the duration of global EME local currency bond funds — Table 17

Sample	Duration in	Period			
		February 2012 – February 2015	February 2012 – February 2013	March 2013 – February 2014	March 2014 – February 2015
33 funds with data on *NAV* and flows available and using JP Morgan GBI-EM Global Diversified index as benchmark	US dollar	9.58*** (56.74)	12.77*** (23.84)	11.12*** (62.15)	7.09*** (31.96)
	Local currency	5.21*** (32.60)	3.84*** (7.46)	5.43*** (30.86)	5.16*** (24.38)
10 funds with data on *NAV*, flows and asset allocation available and using JP Morgan GBI-EM Global Diversified index as benchmark	US dollar	9.93*** (21.58)	12.51*** (11.85)	11.51*** (24.41)	7.83*** (15.16)
	Local currency	5.47*** (12.50)	6.11*** (7.10)	5.54*** (12.58)	4.88*** (9.36)
JP Morgan GBI-EM Global Diversified index	US dollar	9.31*** (7.38)	13.85*** (3.32)	10.63*** (10.85)	6.86*** (2.68)
	Local currency	4.85*** (60.71)	4.66*** (27.90)	4.87*** (45.24)	4.94*** (27.19)

t-statistics in brackets are calculated from standard errors clustered at the fund level.

Sources: EPFR; authors' calculations.

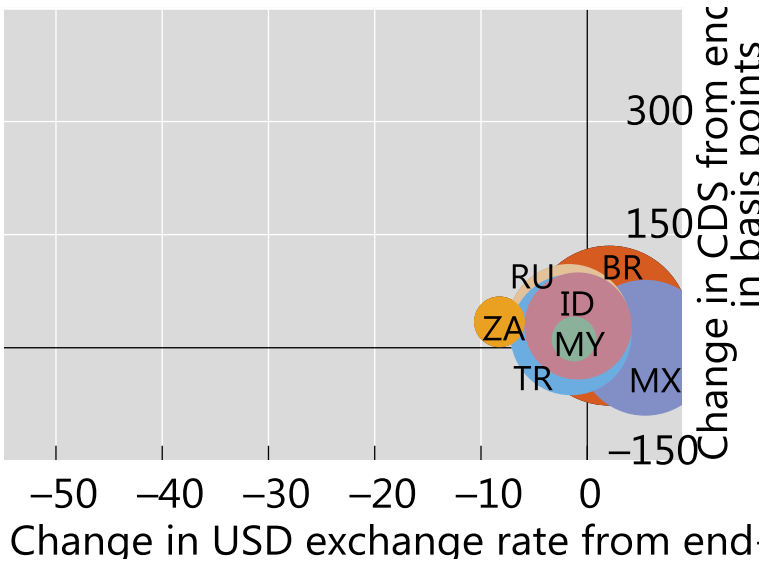
Source: Shek, Shim and Shin (BIS working paper forthcoming)

Evidence from EME sovereign CDS spreads

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-March 2013



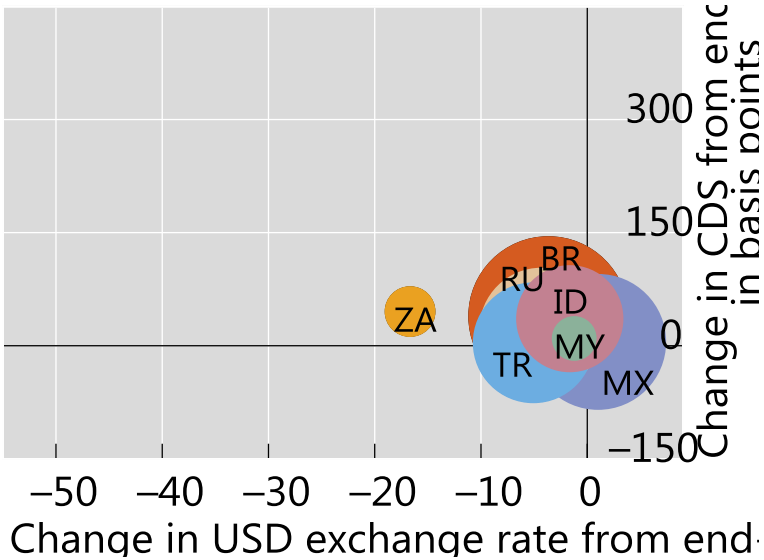
BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-May 2013



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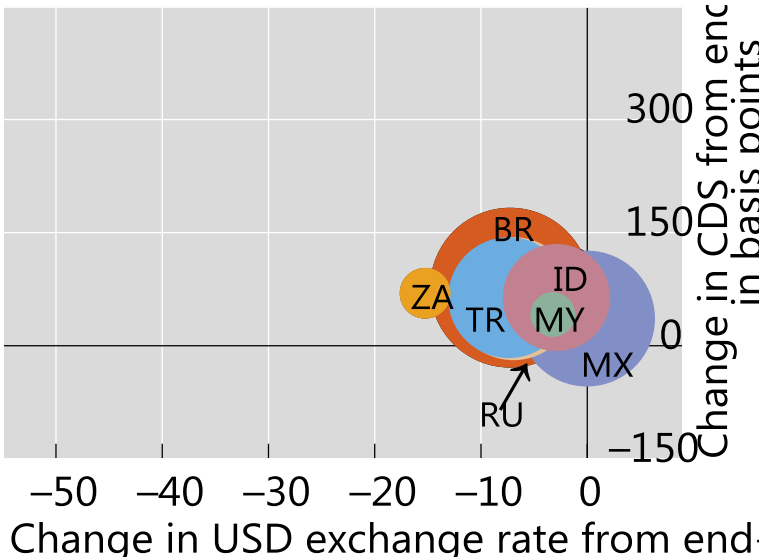
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-June 2013



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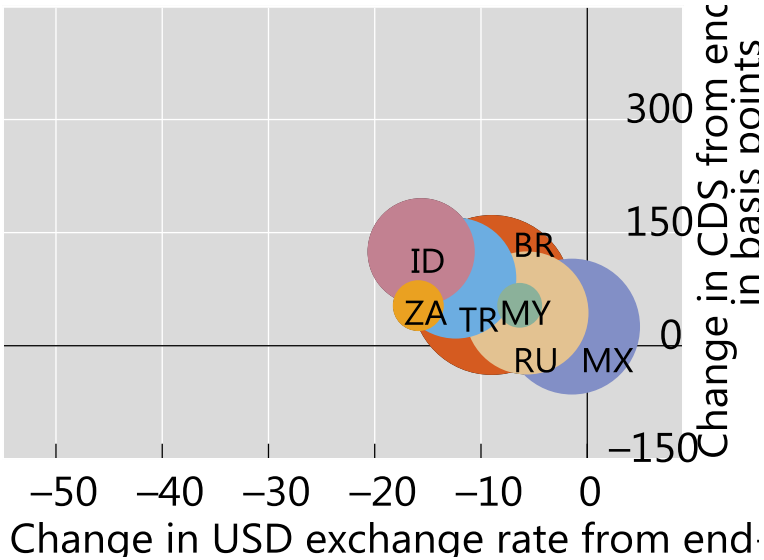
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-September 2013



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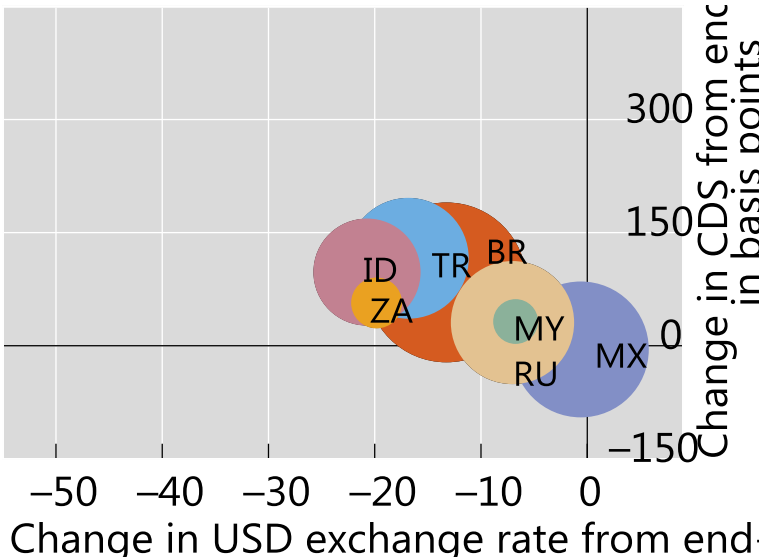
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-December 2013



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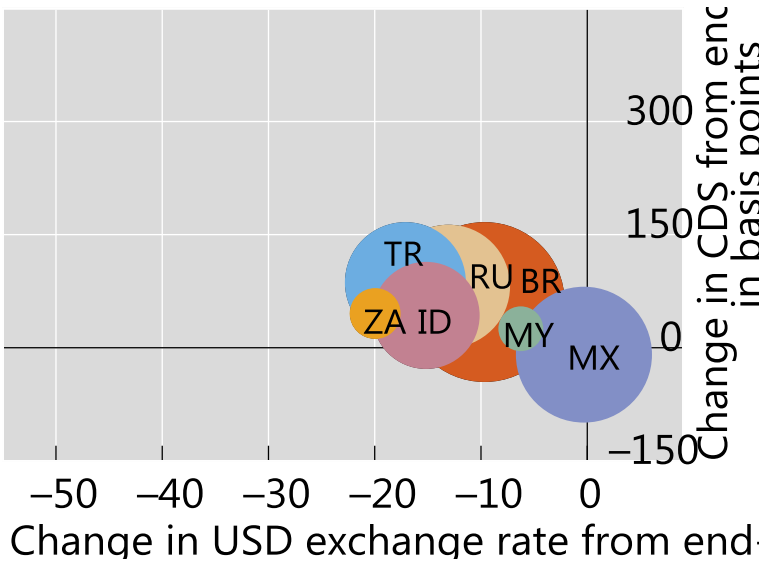
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-March 2014



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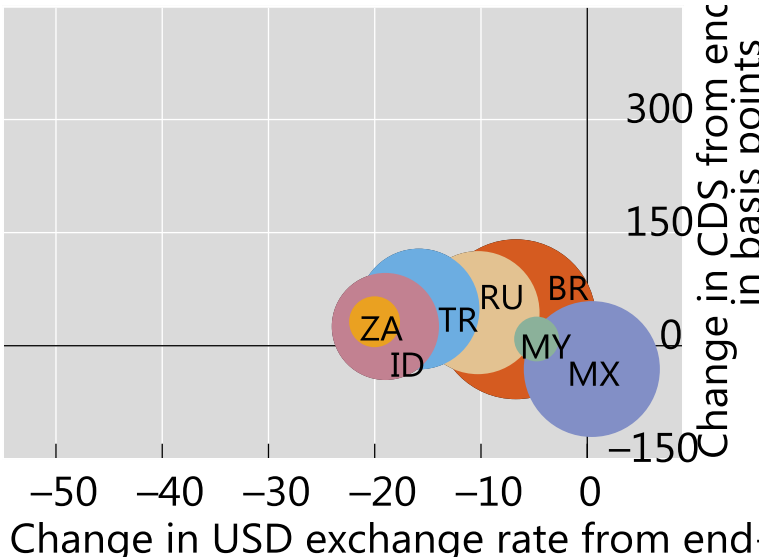
Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-June 2014



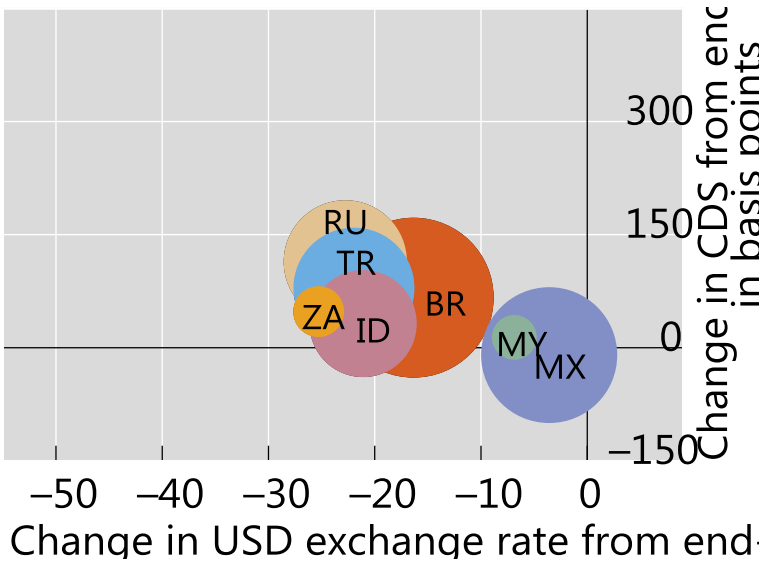
BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-September 2014



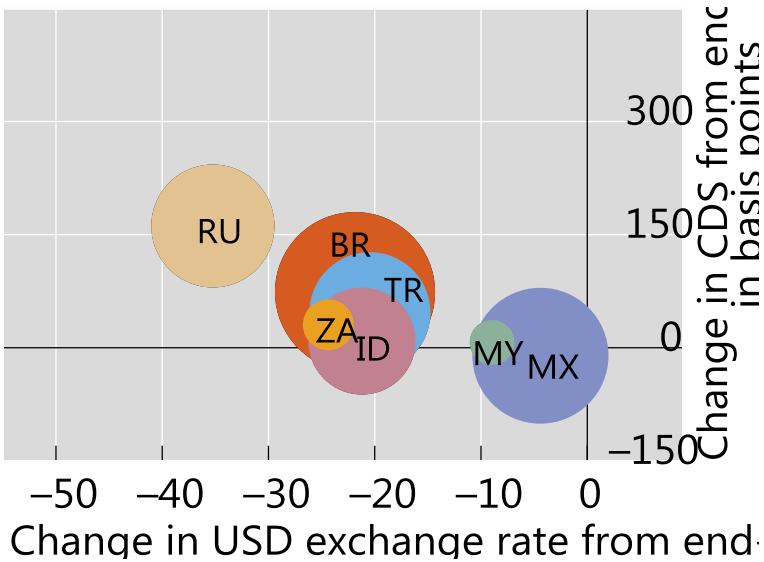
BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

Mid-November 2014



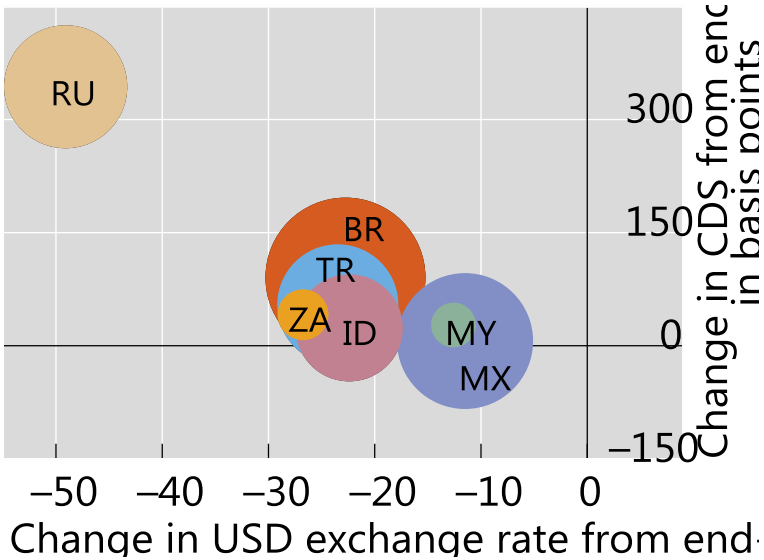
BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-December 2014



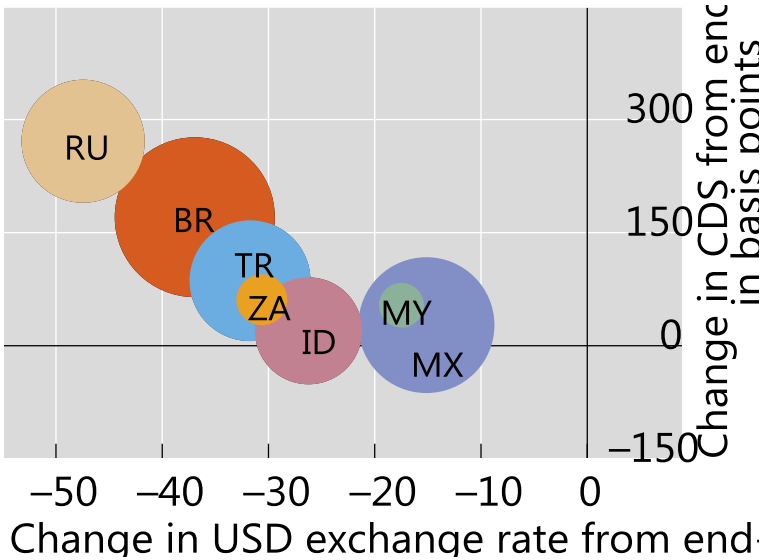
BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-March 2015



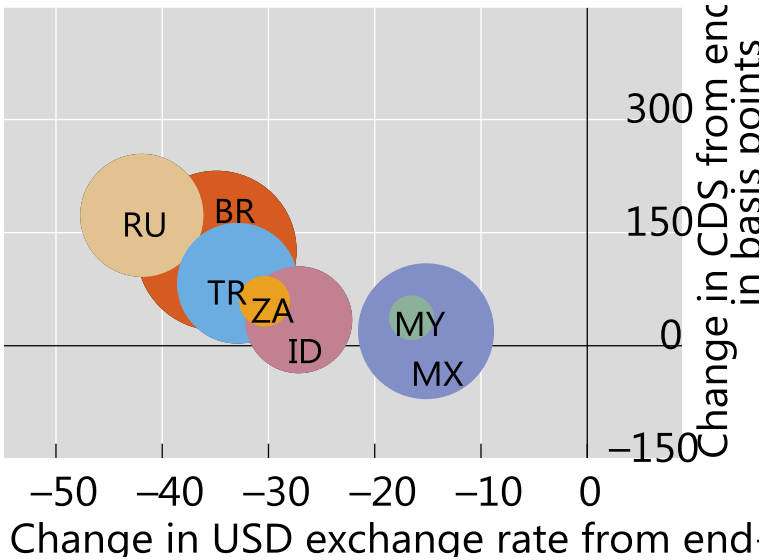
BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

End-May 2015



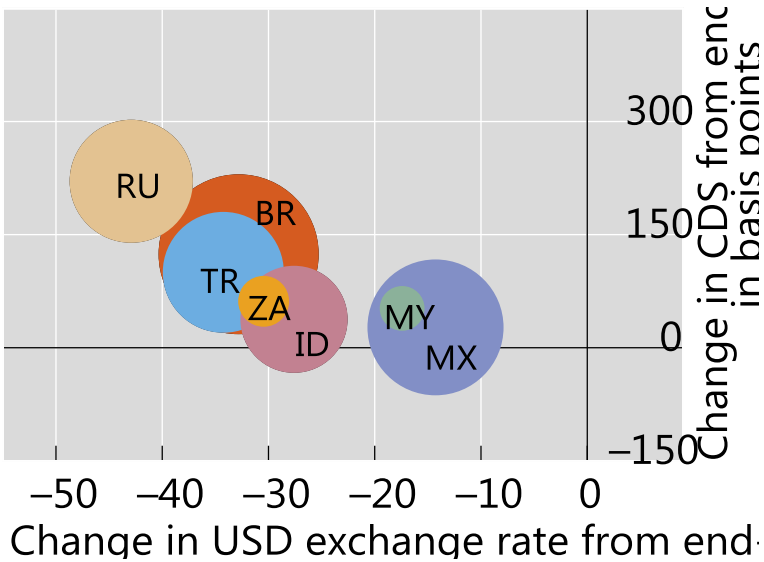
BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

Illustrating the risk-taking channel

Bilateral USD exchange rate and five-year sovereign CDS

Mid-June 2015



BR = Brazil; ID = Indonesia; MX = Mexico; MY = Malaysia; RU = Russia; TR = Turkey; ZA = South Africa.
The size of the bubbles indicates the size of dollar debt in Q4 2014.

Sources: Markit; national data; BIS.

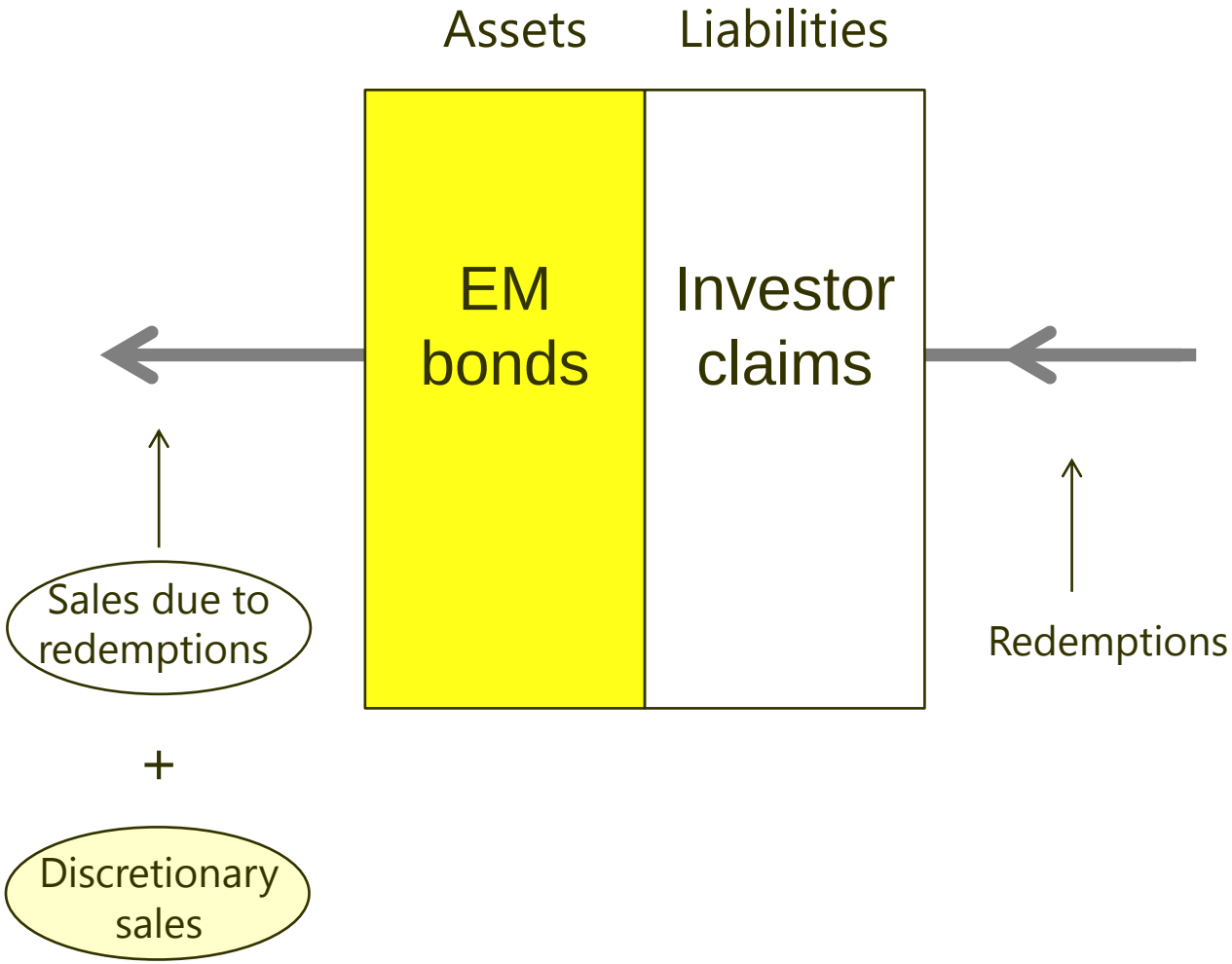
Macro implications

"Leverage-like" behaviour without leverage

- Our understanding of crisis propagation is heavily influenced by experience of 2008 crisis
  - 2008 crisis was made more potent by leverage
  - However, it does not follow that future bouts of market disruptions must follow the same mechanism as the past
- Long-term investors may have limited appetite for losses
  - Risk mitigation or hedging techniques elicit behaviour similar to leveraged players
  - Asset gathering ability rests on relative performance
- All these mechanisms are sharper when prices are more sensitive to shifts risk-taking

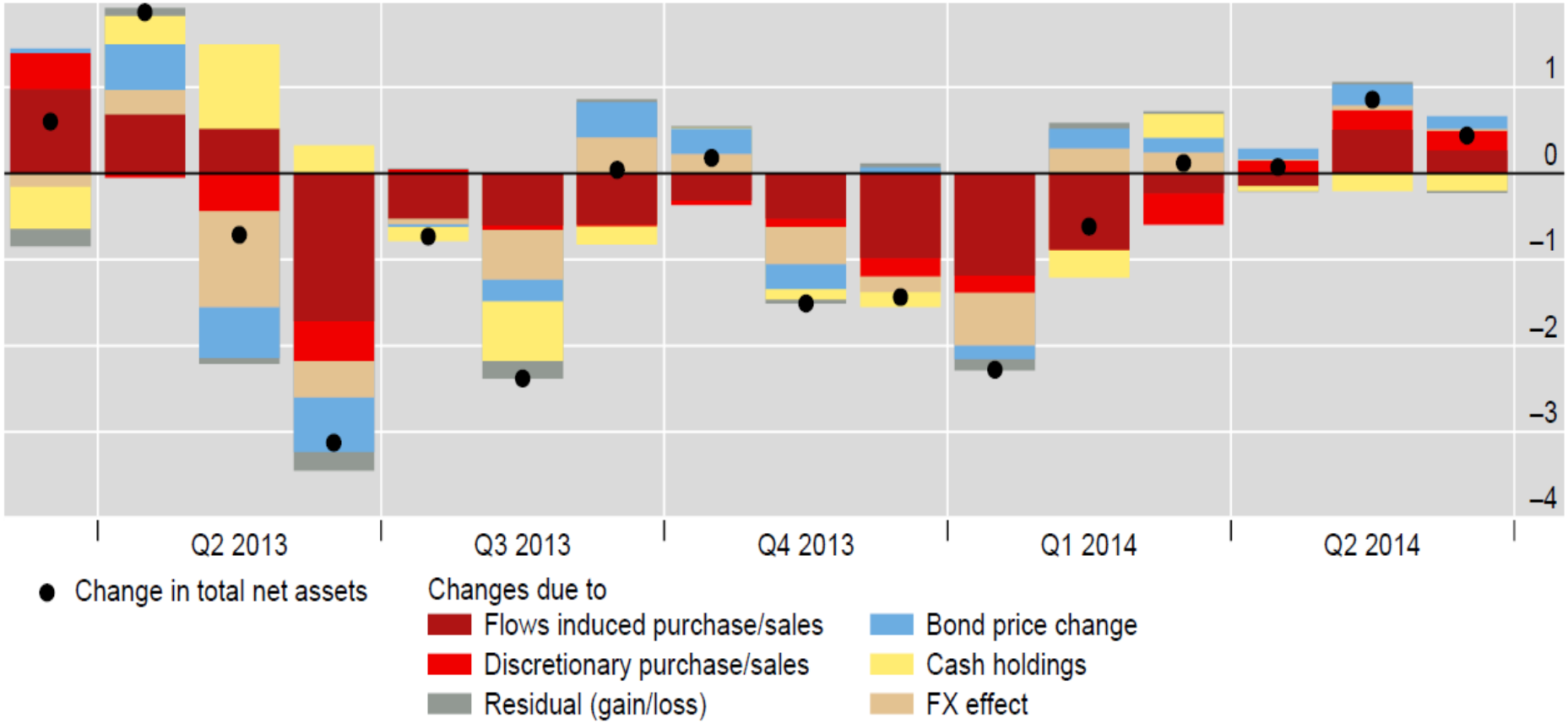
Redemptions and discretionary sales

Sales from redemption pressures and additional discretionary sales



Breakdown of monthly changes in net asset values

Sum over 14 global EM local currency bond funds, in billions of US dollars

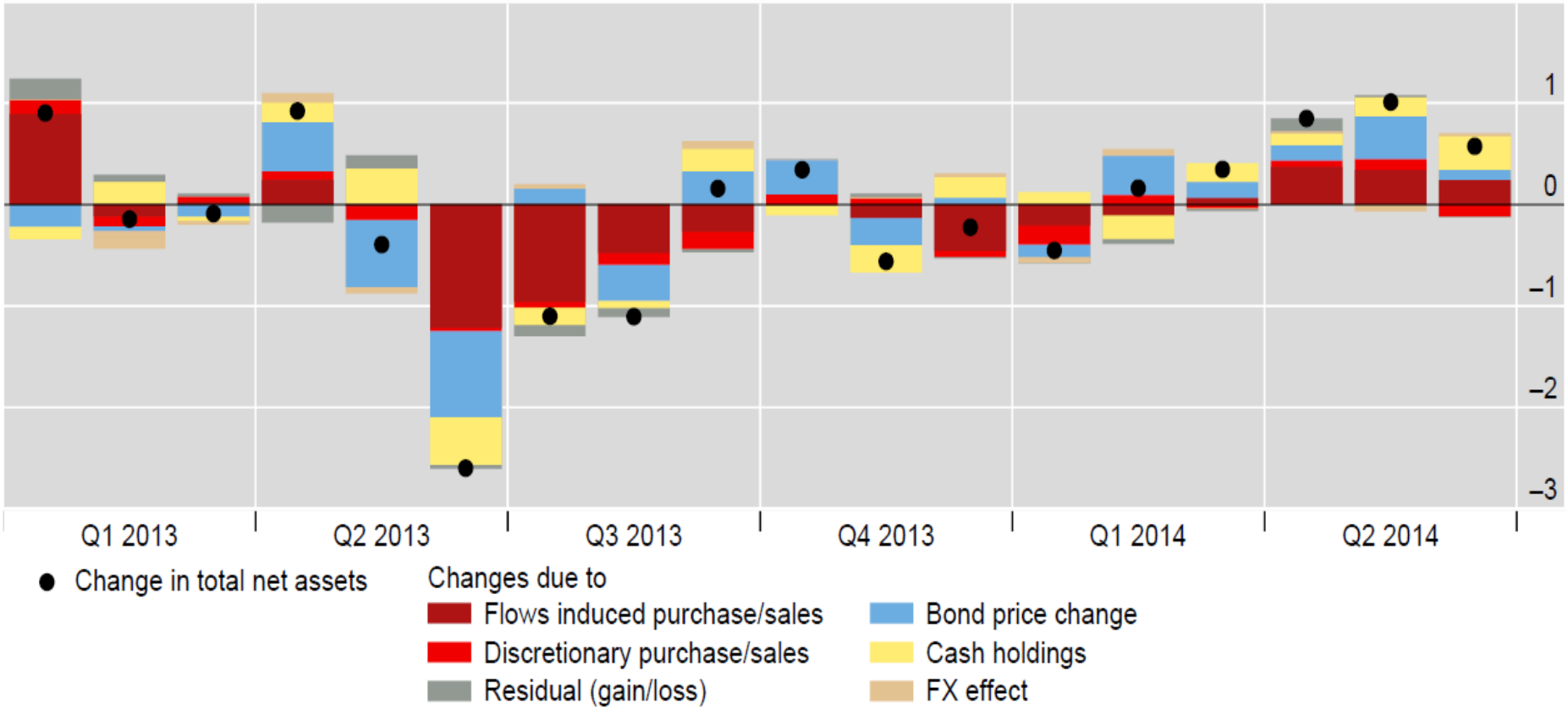


Sources: EPFR; authors' calculations.

Source: Shek, Shim and Shin (BIS working paper, forthcoming)

Breakdown of monthly changes in net asset values

Sum over 16 global EM hard currency bond funds, in billions of US dollars

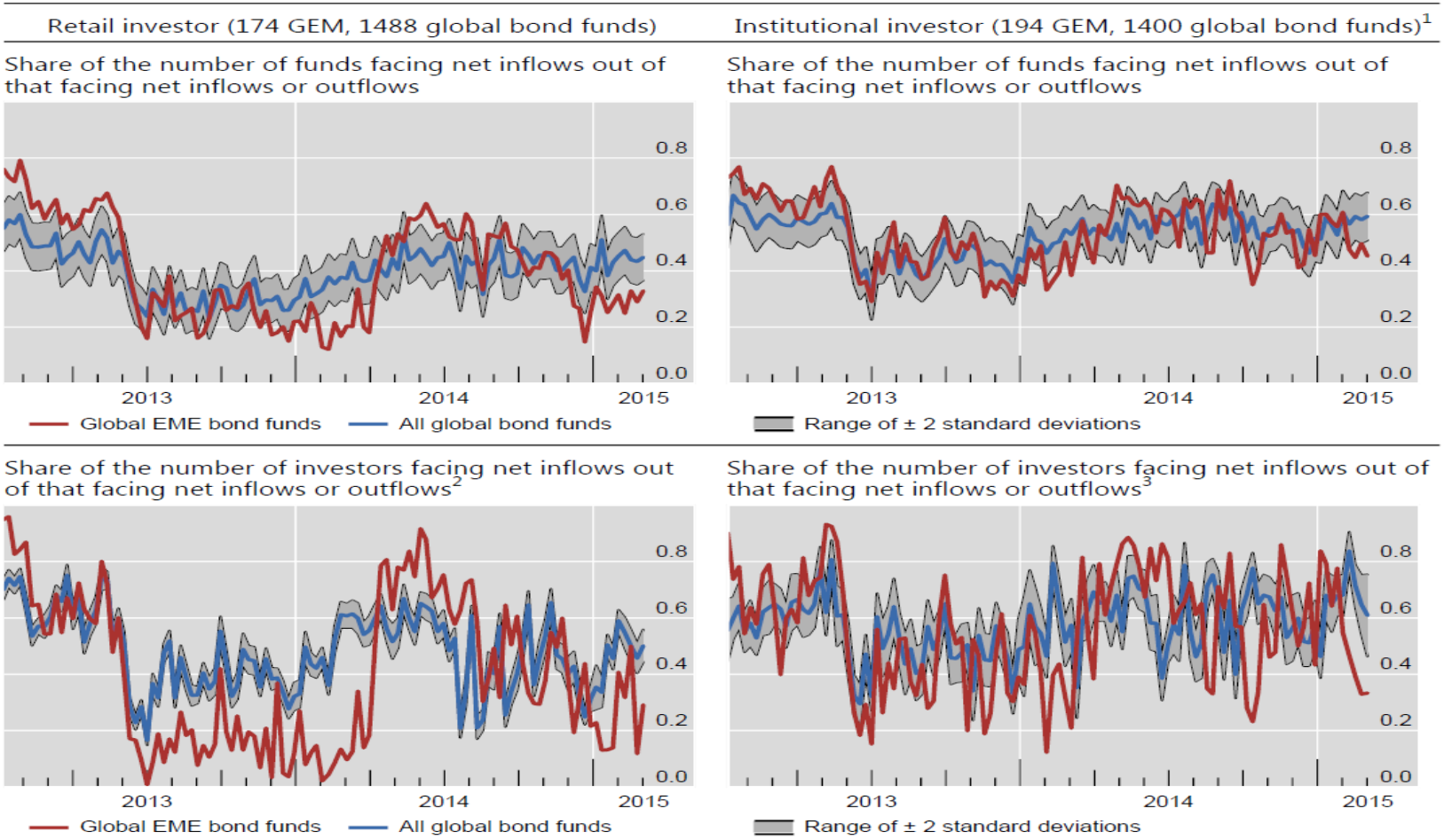


Sources: EPFR; authors' calculations.

Source: Shek, Shim and Shin (BIS working paper, forthcoming)

Measuring investor clustering in global EME bond funds

January 2013 to February 2015, weekly data — Graph 5



Figures in brackets represent the number of funds in each category.

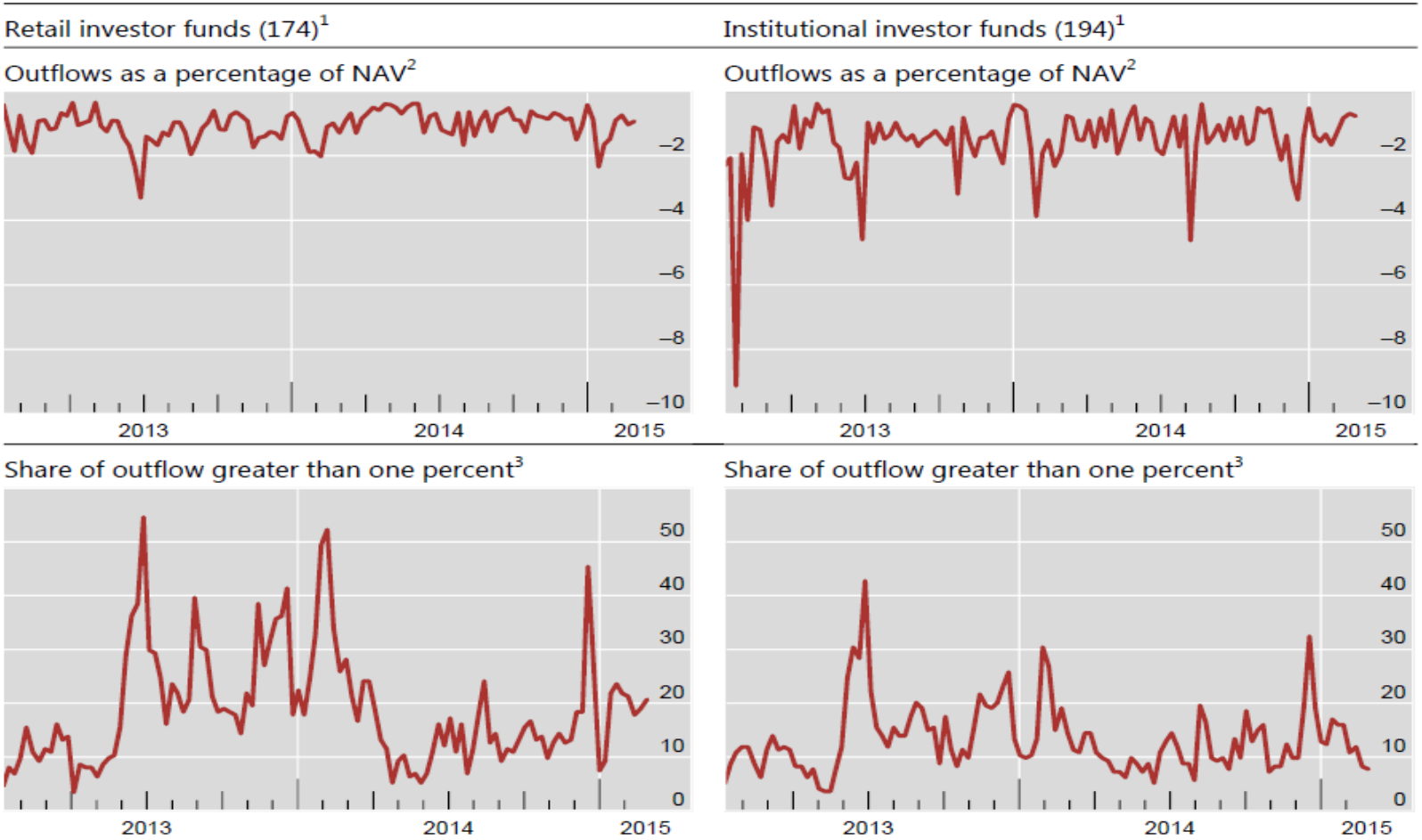
[1] In the EPFR database, institutional investor funds are defined as funds targeting institutional investors only or those with the minimum amount of $100,000 per account. [2] Assume that the average size of retail investors is $1 million. [3] Assume that the average size of institutional investors is $10 million.

Sources: EPFR; authors' calculations.

Source: Shek, Shim and Shin (BIS working paper, forthcoming)

Global EME bond funds facing sizable redemptions

January 2013 to February 2015, weekly data — Graph 5



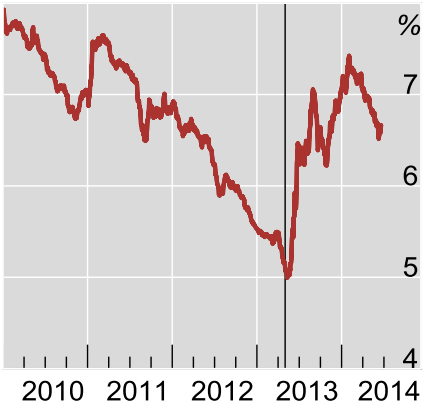
[1] Figures in brackets represent the number of funds in each category. [2] The total amount of outflows in each week divided by the total NAV of those funds facing outflows in that week. [3] The number of funds facing outflows greater than 1 per cent of their own NAV divided by the total number of funds in each category (174 retail funds and 194 institutional funds, respectively).

Sources: EPFR; authors' calculations.

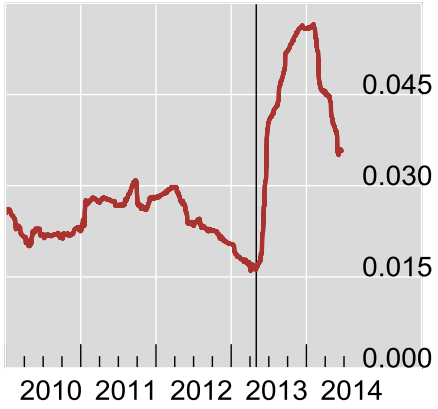
Source: Shek, Shim and Shin (BIS working paper, forthcoming)

Yields of local EM government bonds and the EM exchange rates

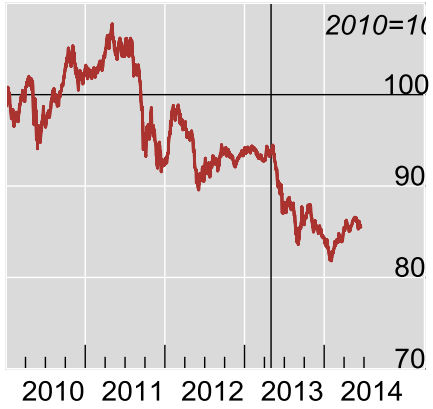
Five-year govt bond yields



Volatility of yields



The exchange rate



The black vertical line corresponds to 1 May 2013 (FOMC statement changing the wording on asset purchases).

Countries included: Brazil, India, Indonesia, Malaysia, Mexico, the Philippines, Poland, South Africa and Turkey.

Source: Turner (2014) BIS working paper http://www.bis.org/publ/work441.pdf

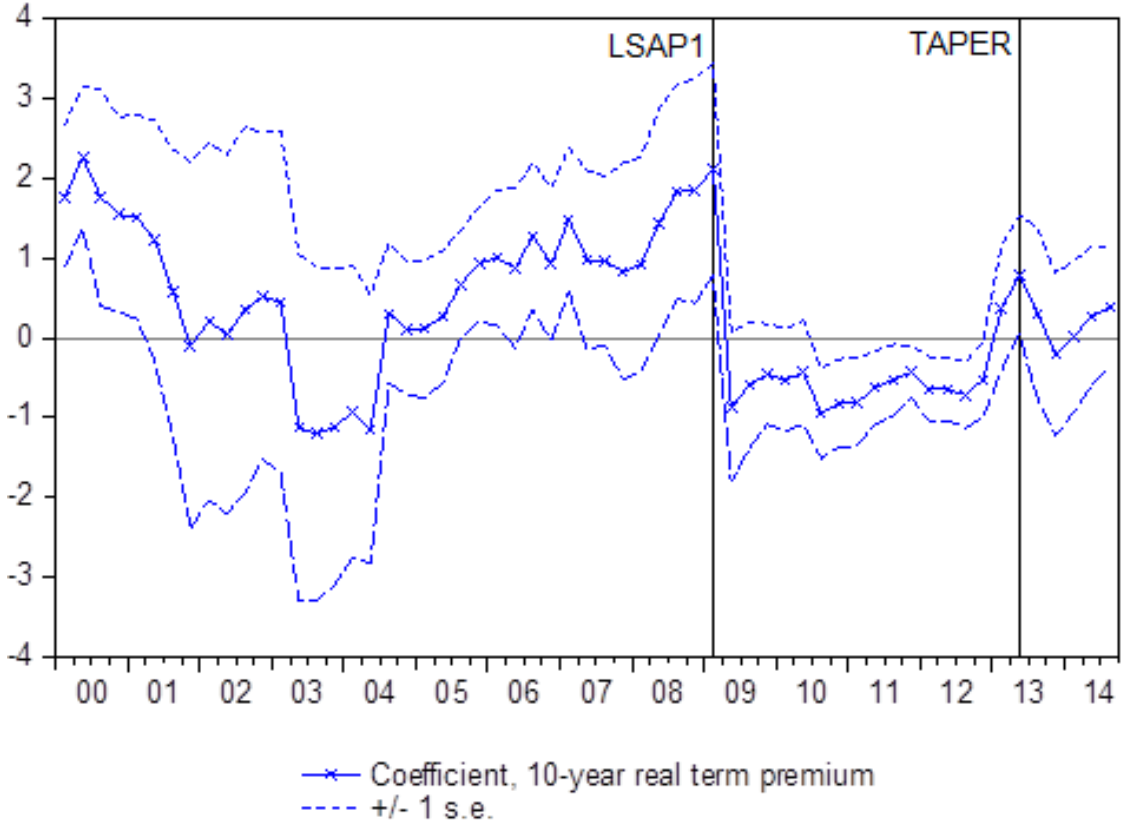
Elements in possible distress loop

1. Steepening of local currency yield curve
2. Currency depreciation, corporate distress, freeze in corporate CAPEX, slowdown in growth
3. Runs of wholesale corporate deposits from domestic banking sector
4. Asset managers cut back positions in EME corporate bonds citing slower growth in EMEs
5. Back to Step 1, and repeat ...

Shin H S (2013) "Second phase of global liquidity and its impact on emerging economies"
http://www.frbsf.org/economic-research/events/2013/november/asia-economic-policy-conference/

Monetary policy spillovers and "spillbacks"

Monetary policy spillovers and "spillbacks"



McCauley, McGuire and Sushko (2014):
US yield curve flattening associated with US dollar offshore bond issuance after 2009

Monetary policy spillovers and "spillbacks"

- McCauley et al (2014): USD bond issuance outside the United States associated with US treasury yield curve flattening
- Three questions:
  1. How much is the recent weak macro reading in the United States due to the strong dollar?
  2. To what extent is the strong dollar due to "net short" position in dollars outside the United States?
  3. How should monetary policy take account of spillbacks – and hence initial spillovers?