



BANK FOR INTERNATIONAL SETTLEMENTS

Gauging procyclicality and financial vulnerability in Asia through the BIS banking and financial statistics

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Bank for International Settlements

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

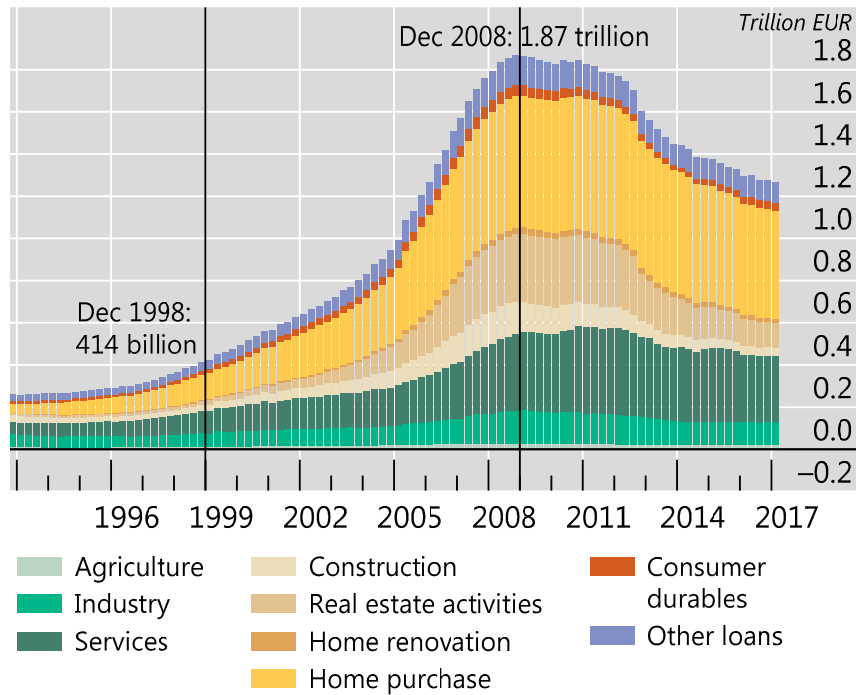


Retrospective

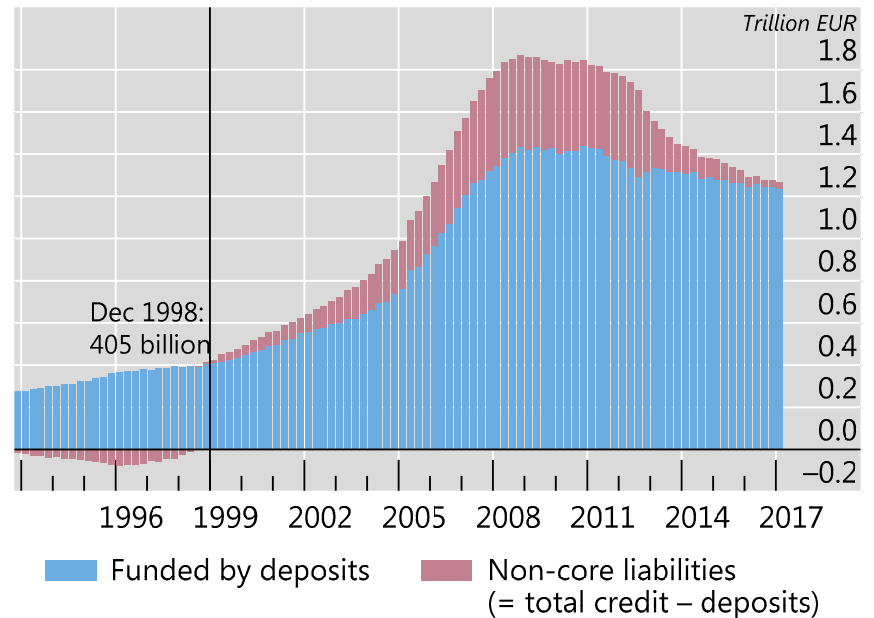
- On the 10th anniversary of the GFC and the 21st anniversary of the Asian financial crisis,
 - Take perspective of contemporary observer
 - Showcase the BIS international banking statistics
- Focus on cross-border dimension, because:
 - That's where the measurement takes place
 - Procyclical components of bank balance sheets often show up most clearly

Spain: Banking sector credit composition and funding

Total credit by main activity and type of spending



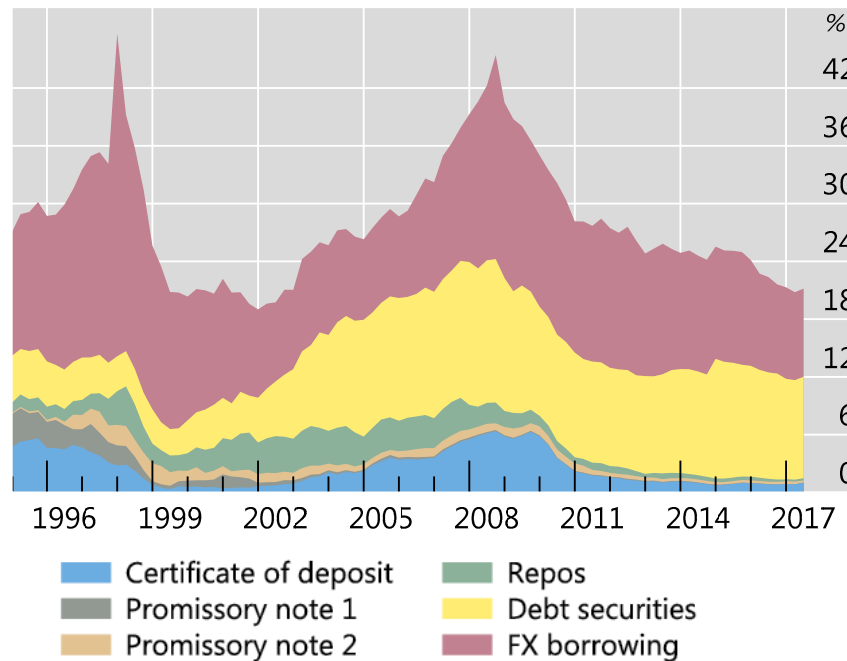
Total credit by source of funding



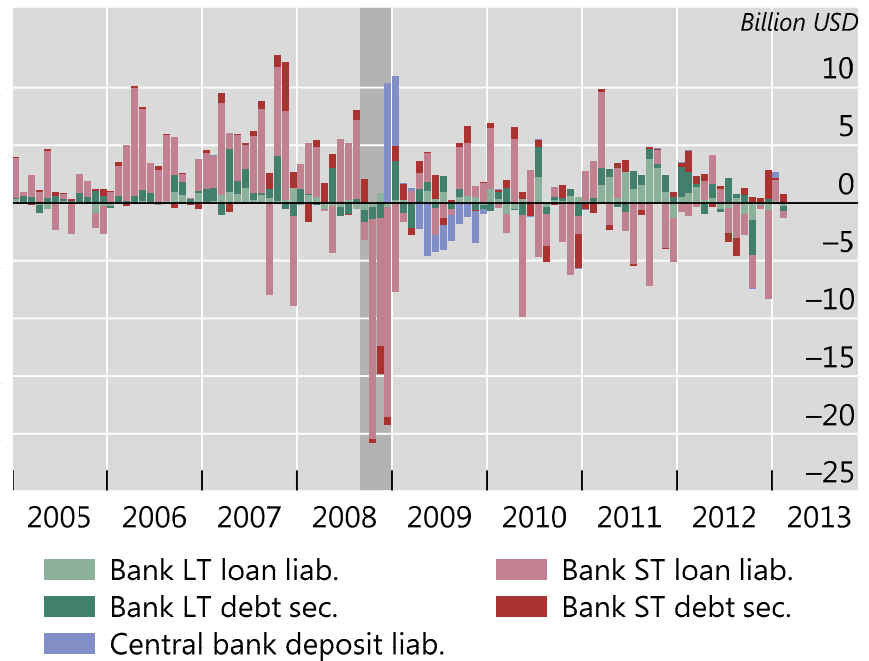
Source: Bank of Spain.

Korea: Non-core liabilities and capital flow

Non-core liabilities of banking sector as a proportion of M2



Gross capital flows



Sources: Shin and Shin (2011): "Procyclicality and Monetary Aggregates" *NBER Working Paper Series*, no 16836, February; Bank of Korea; authors' calculations.

Three modes of leveraging up

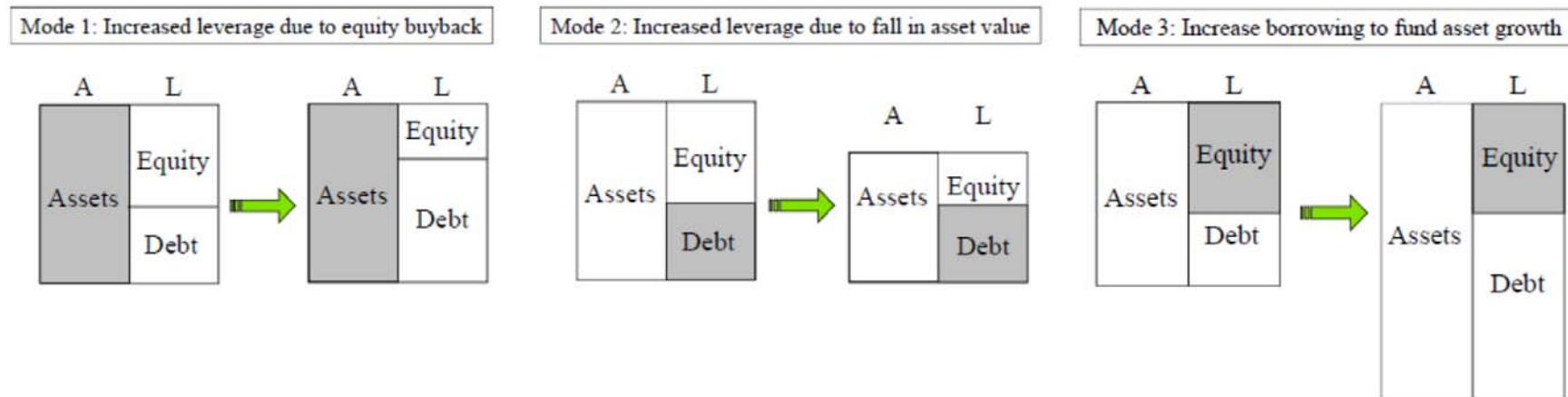
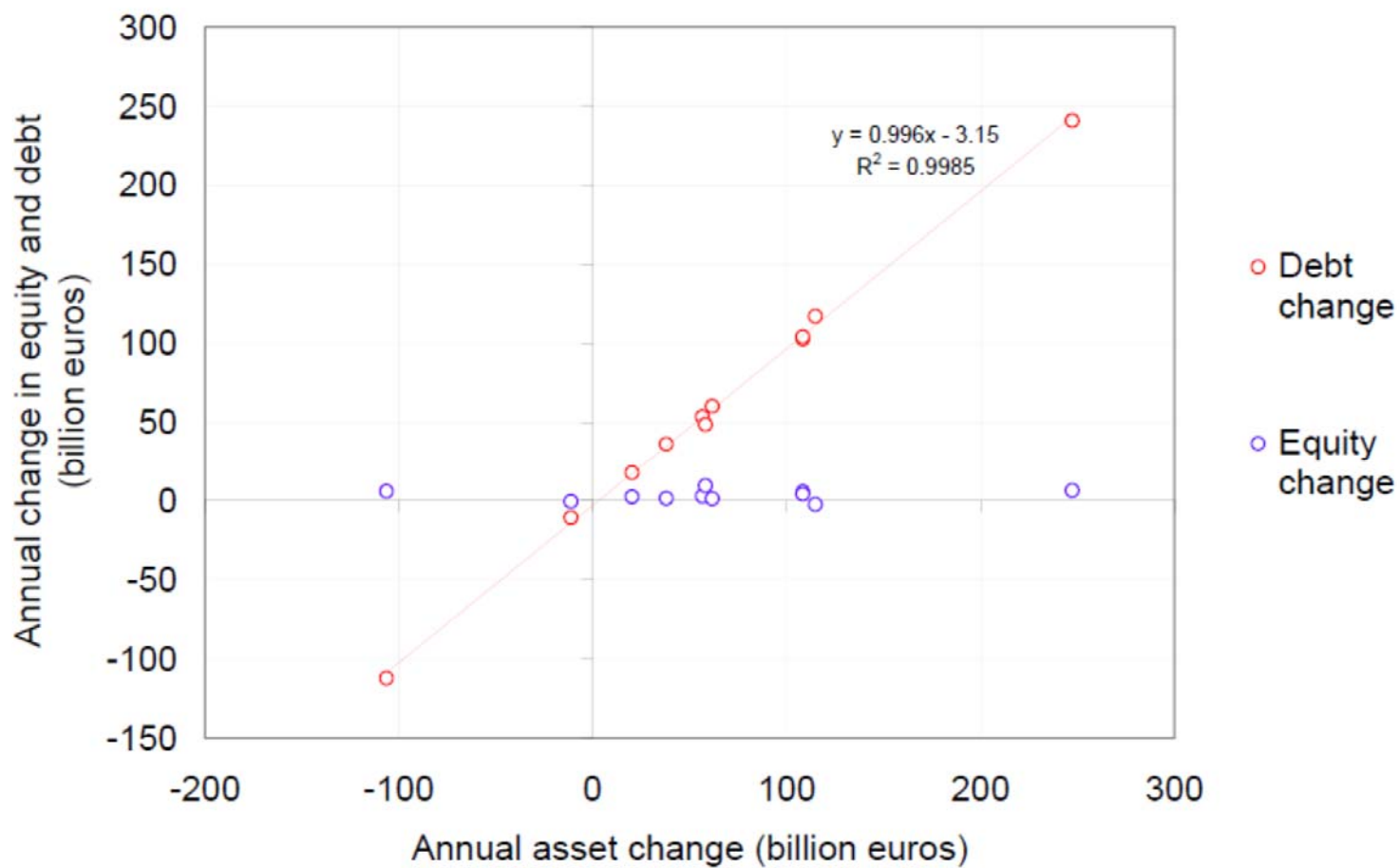


Figure 15. **Three modes of leveraging up:** Mode 1 is through an equity buyback through a debt issue. Mode 2 is through a dividend financed by asset sale. Mode 3 is through increased borrowing to fund new assets. In each case the grey area indicates balance sheet component that is held fixed

For global banks, mode 3 applies

Example of global bank





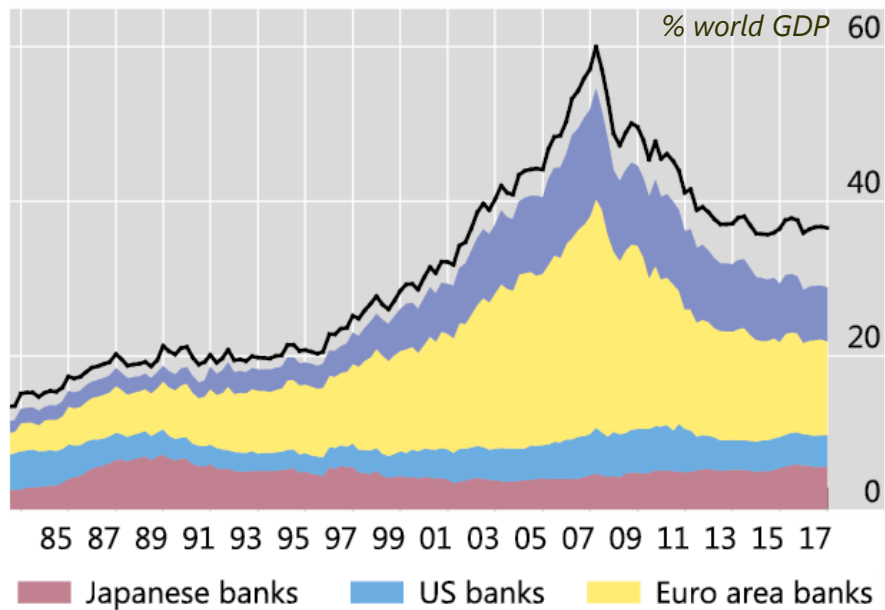
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Global banking and EMEs

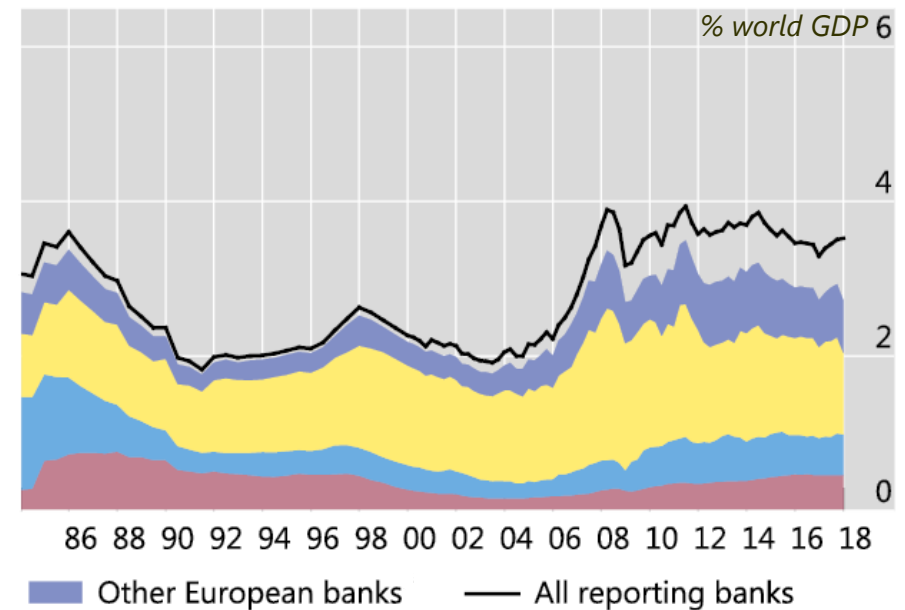


Broad trends in international bank lending, by lender nationality

Global cross-border claims



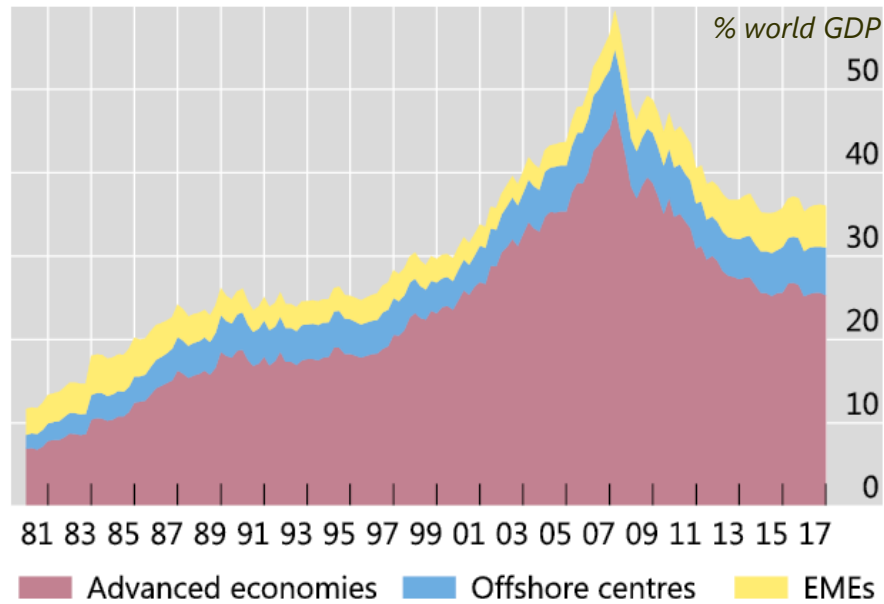
International claims on EMEs



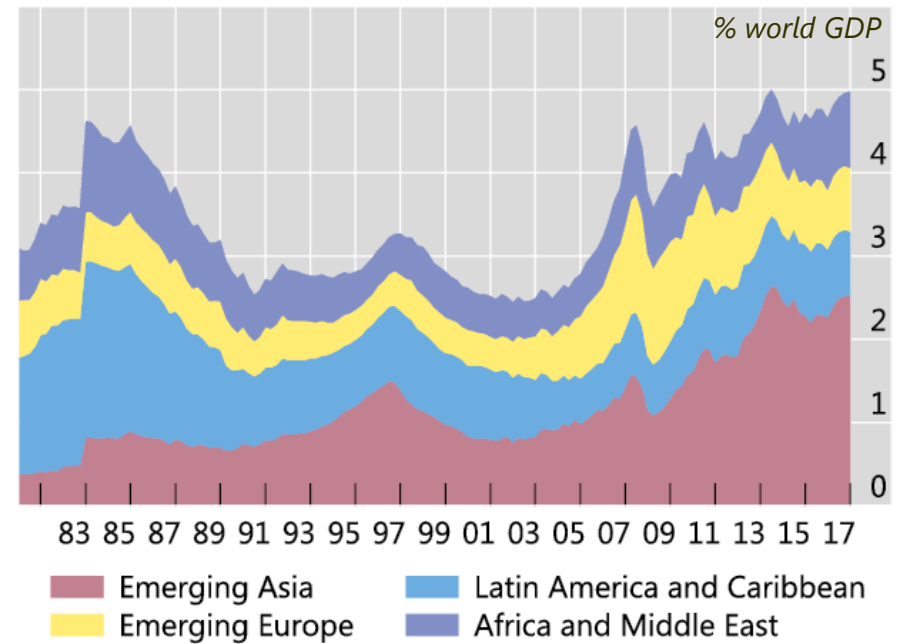
Sources: IMF, *World Economic Outlook*; BIS locational banking statistics and consolidated banking statistics on IC basis.

Broad trends in international bank lending, by borrower location

By borrowing country group



By EME borrowing region



Sources: IMF, *World Economic Outlook*; BIS locational banking statistics.



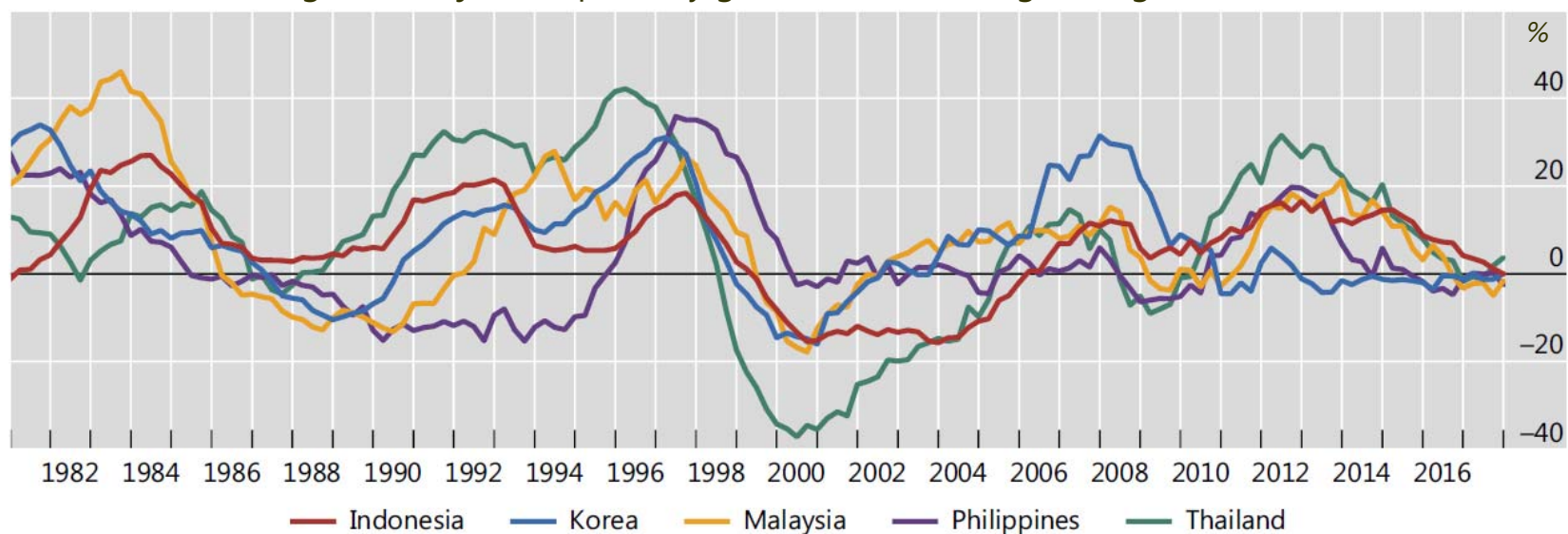
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Cross-border banking developments in the run-up to 1997



Growth of cross-border claims on AFC-5 countries

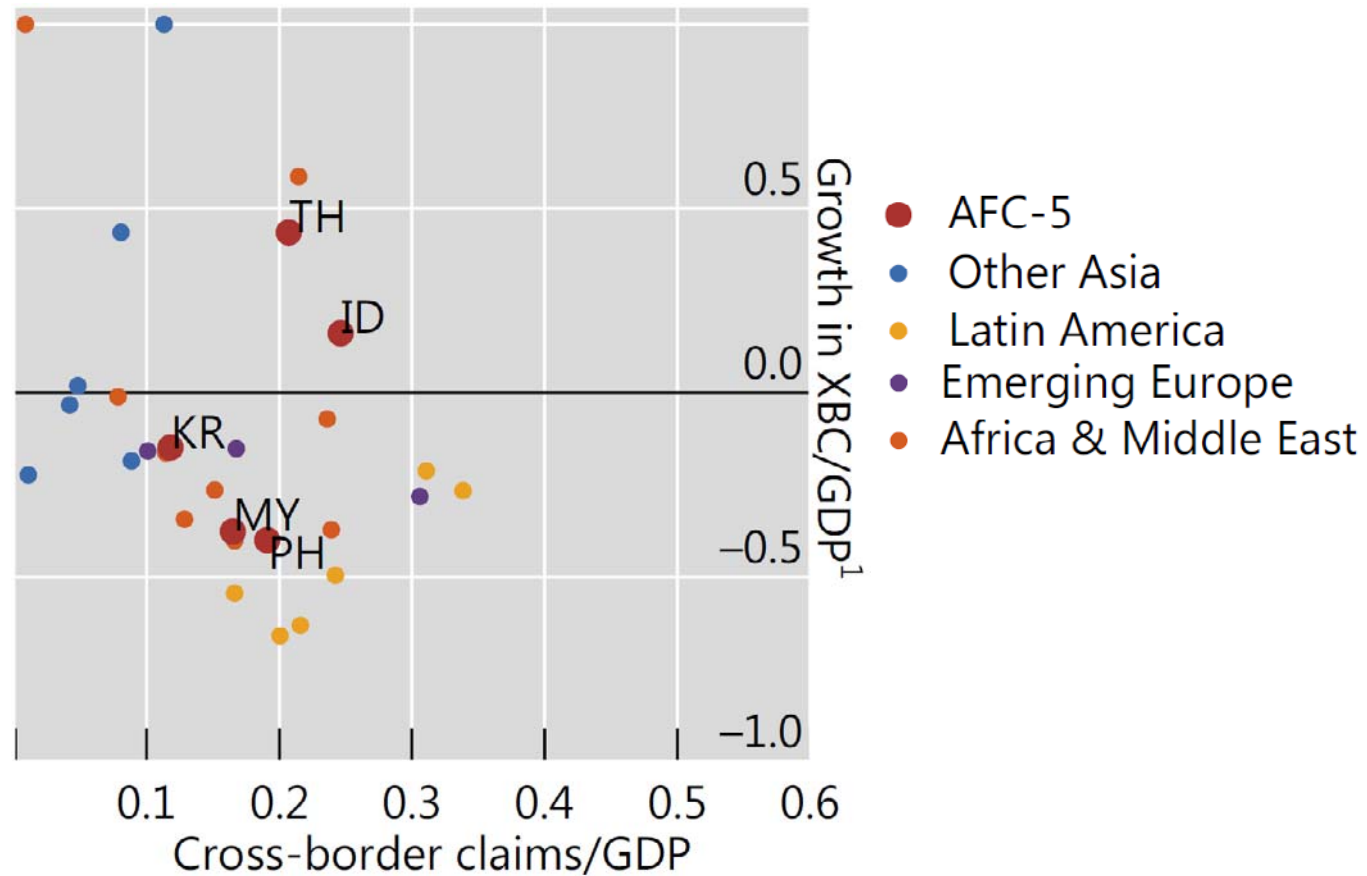
Break- and exchange rate adjusted quarterly growth, 12Q moving average



Source: BIS locational banking statistics.

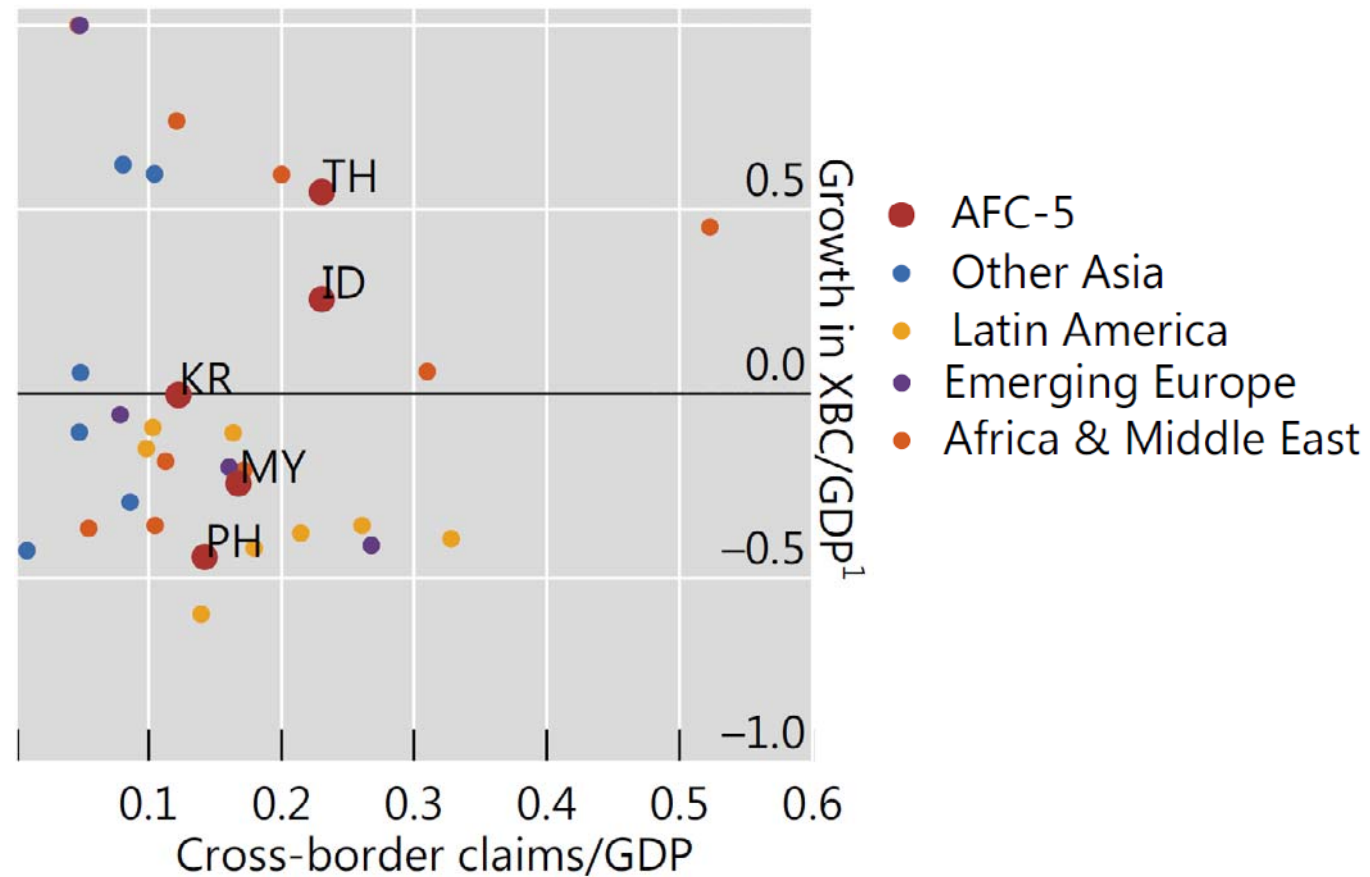
Cross-border bank claims as share of GDP

Stock and 12-quarter growth rates, end-June 1991



Cross-border bank claims as share of GDP

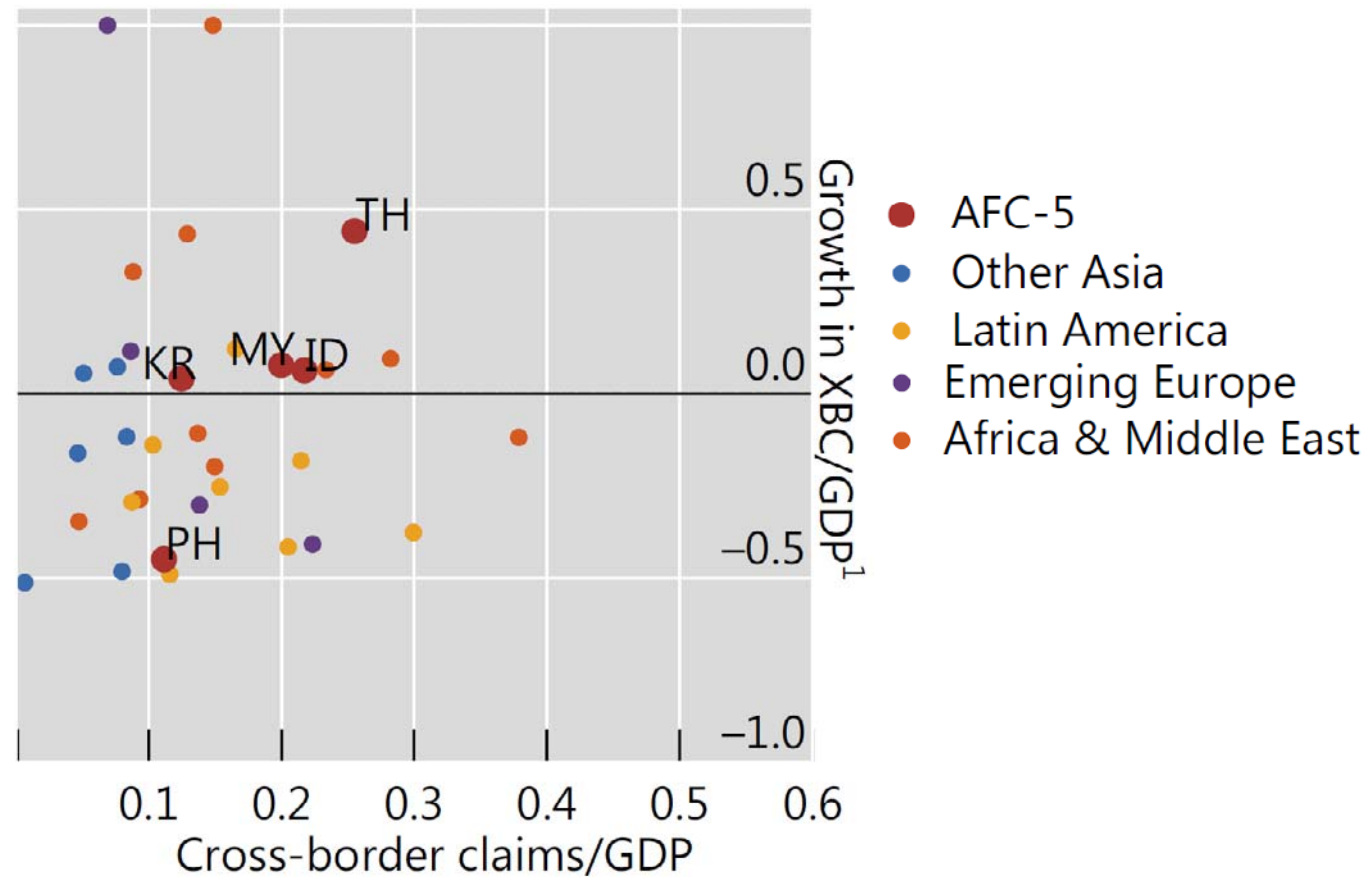
Stock and 12-quarter growth rates, end-June 1992



Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

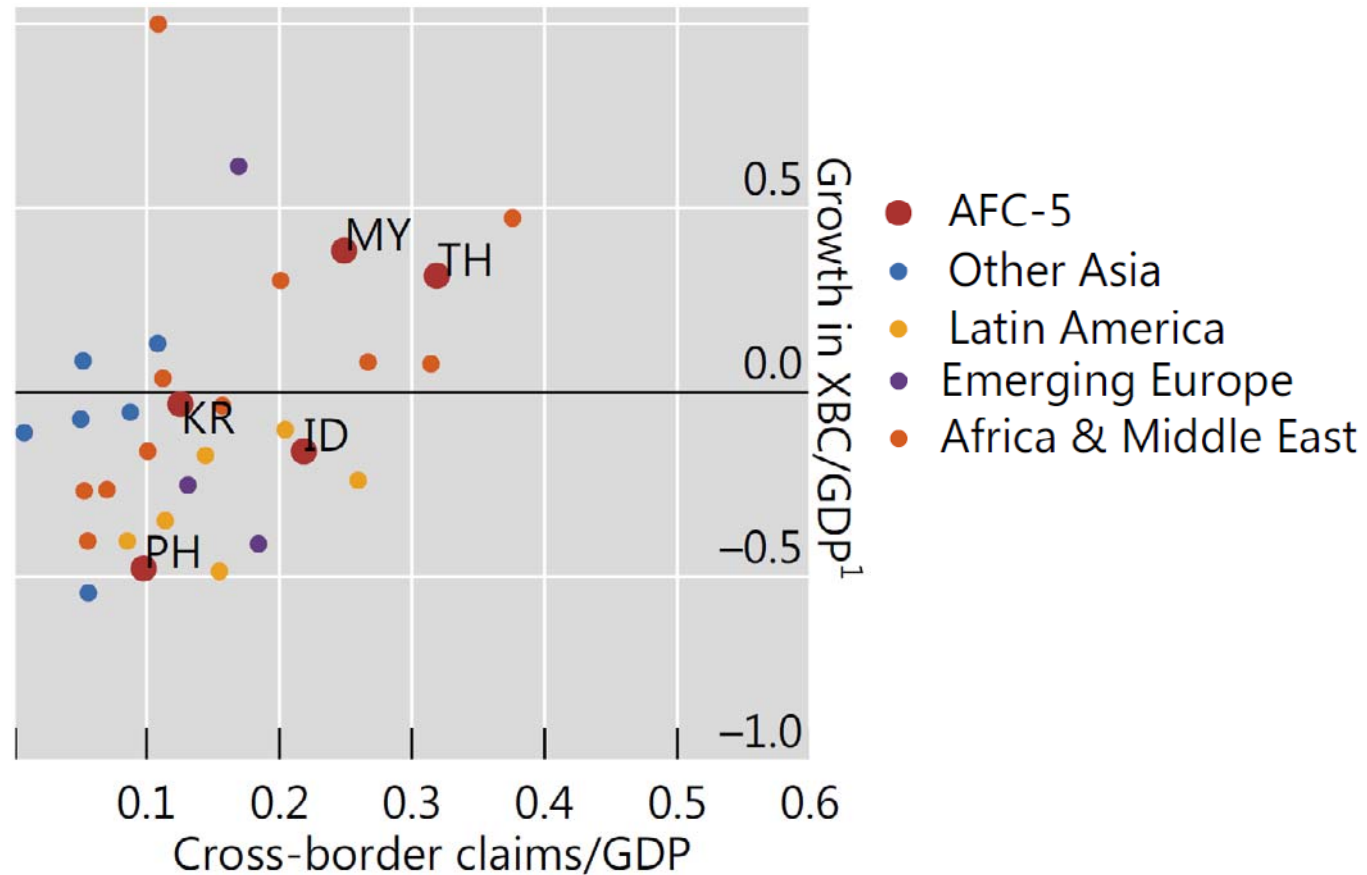
Cross-border bank claims as share of GDP

Stock and 12-quarter growth rates, end-June 1993



Cross-border bank claims as share of GDP

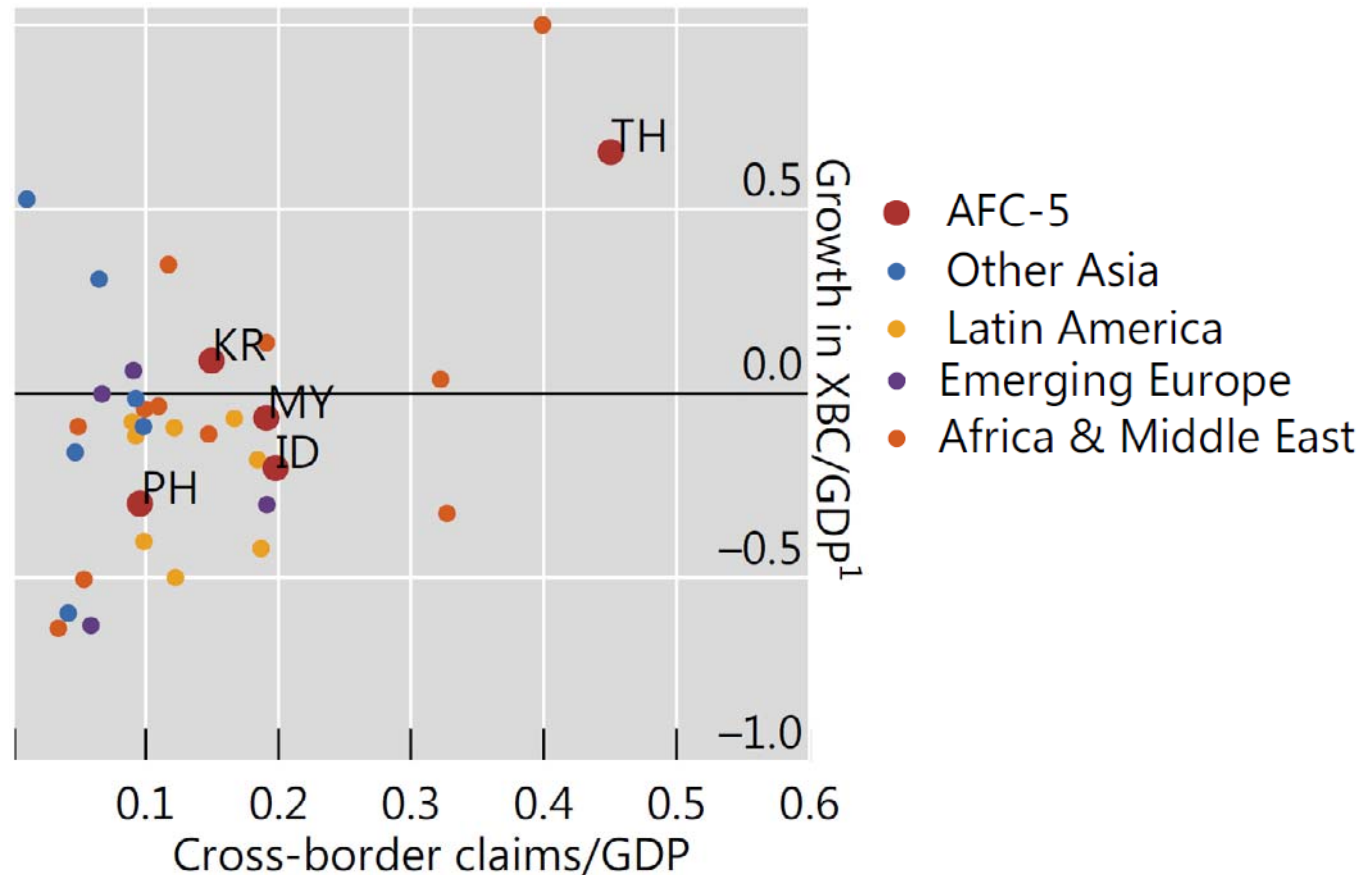
Stock and 12-quarter growth rates, end-June 1994



Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

Cross-border bank claims as share of GDP

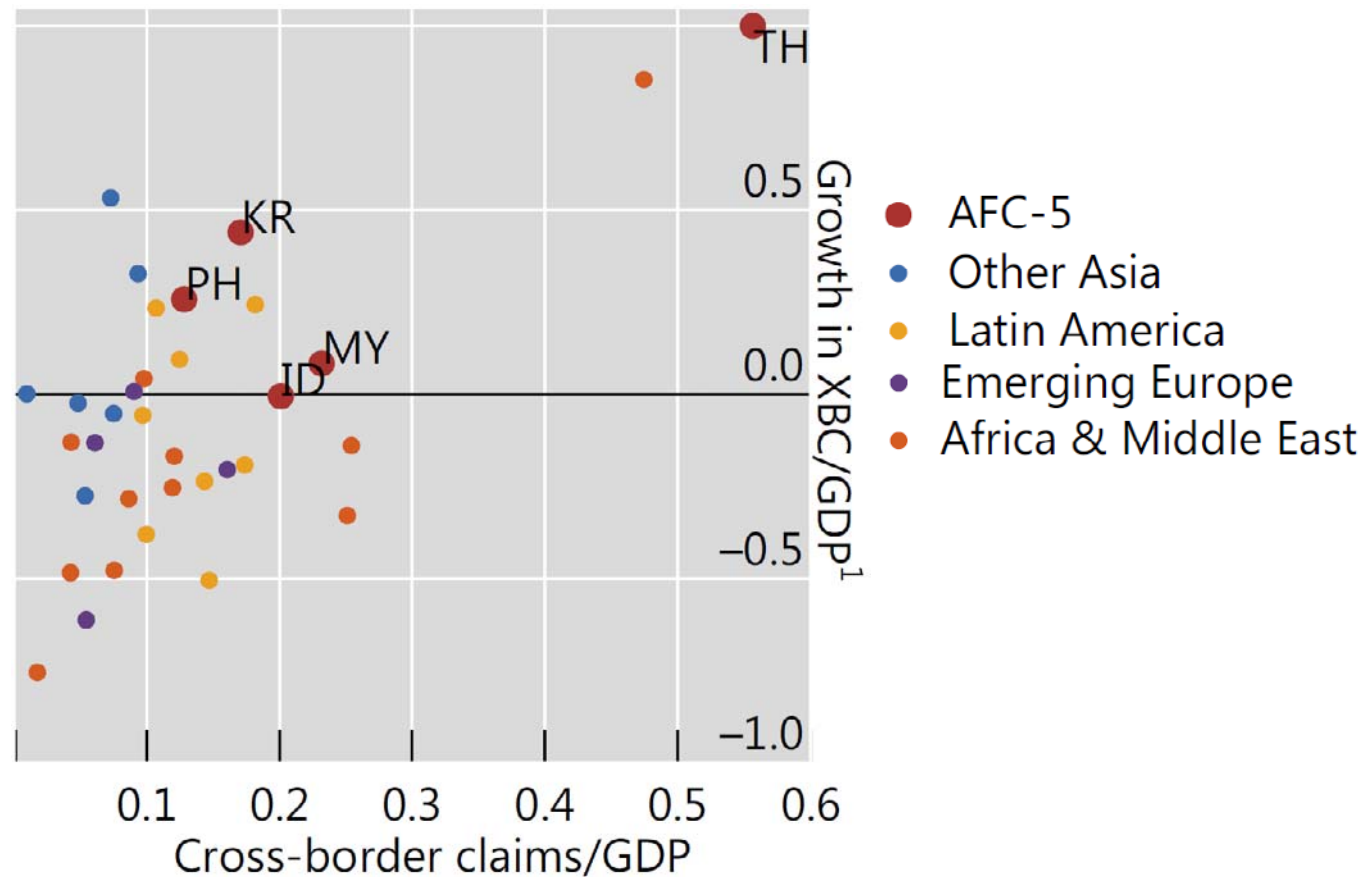
Stock and 12-quarter growth rates, end-June 1995



Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

Cross-border bank claims as share of GDP

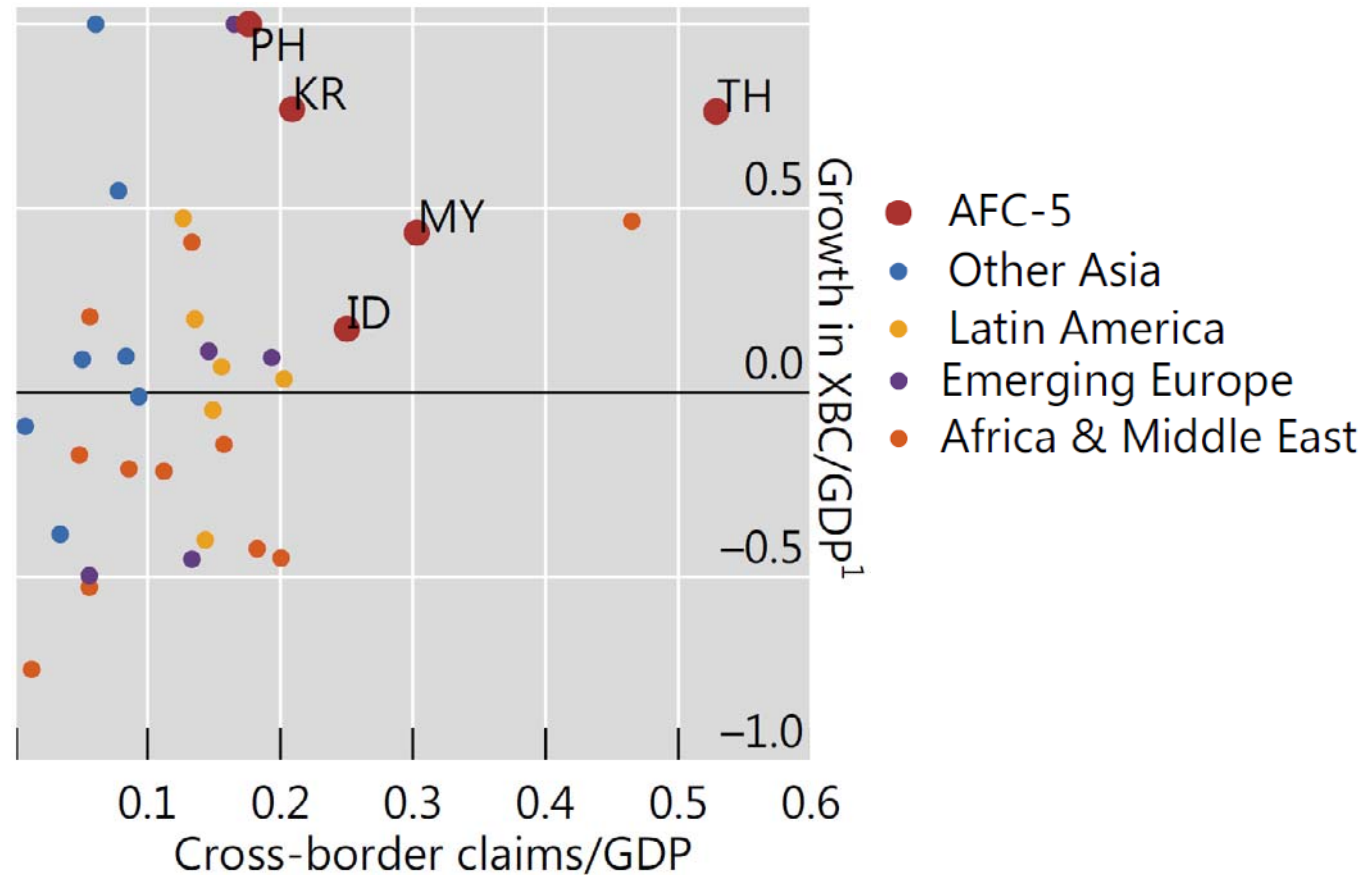
Stock and 12-quarter growth rates, end-June 1996



Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

Cross-border bank claims as share of GDP

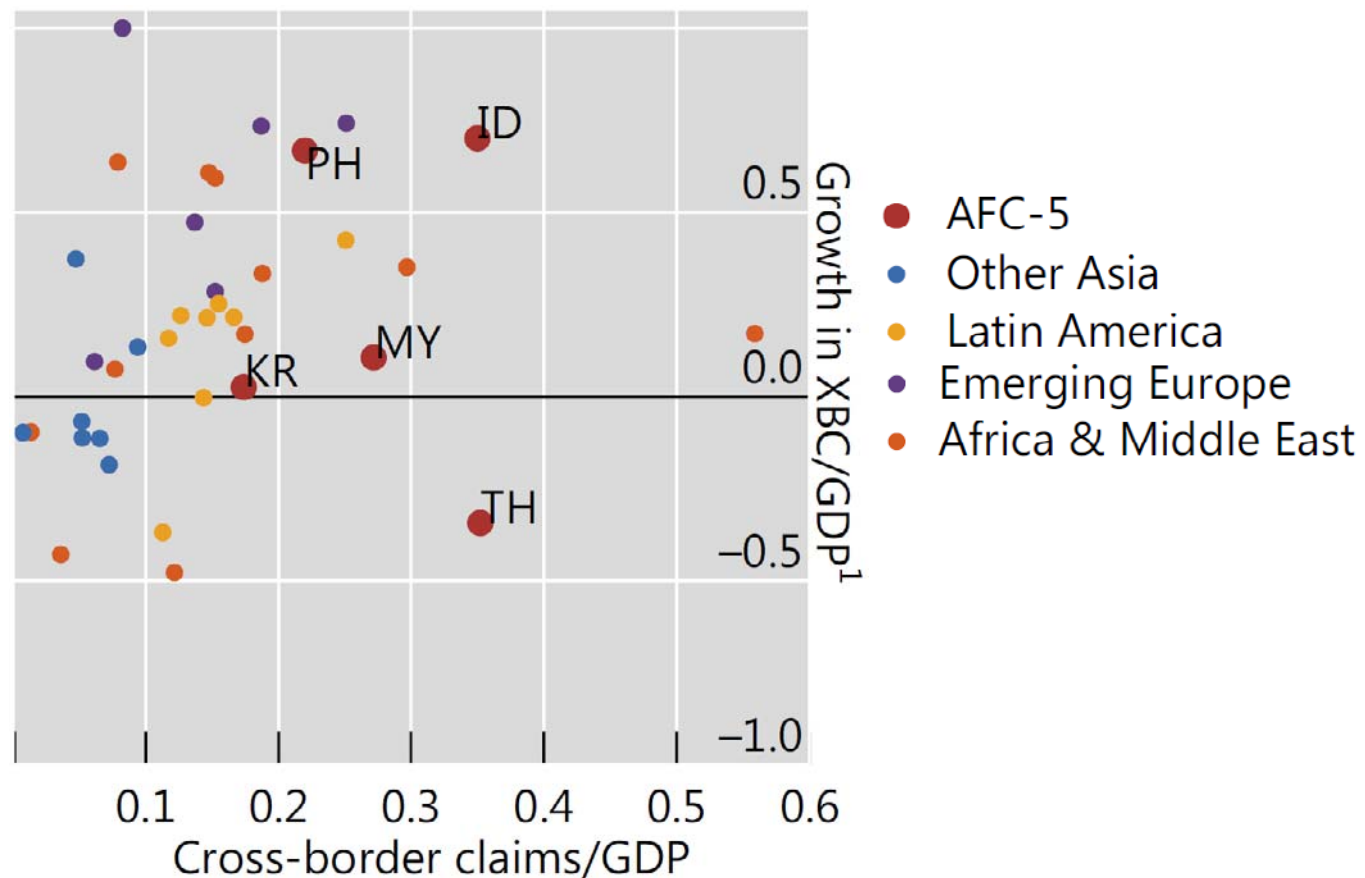
Stock and 12-quarter growth rates, end-June 1997



Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

Cross-border bank claims as share of GDP

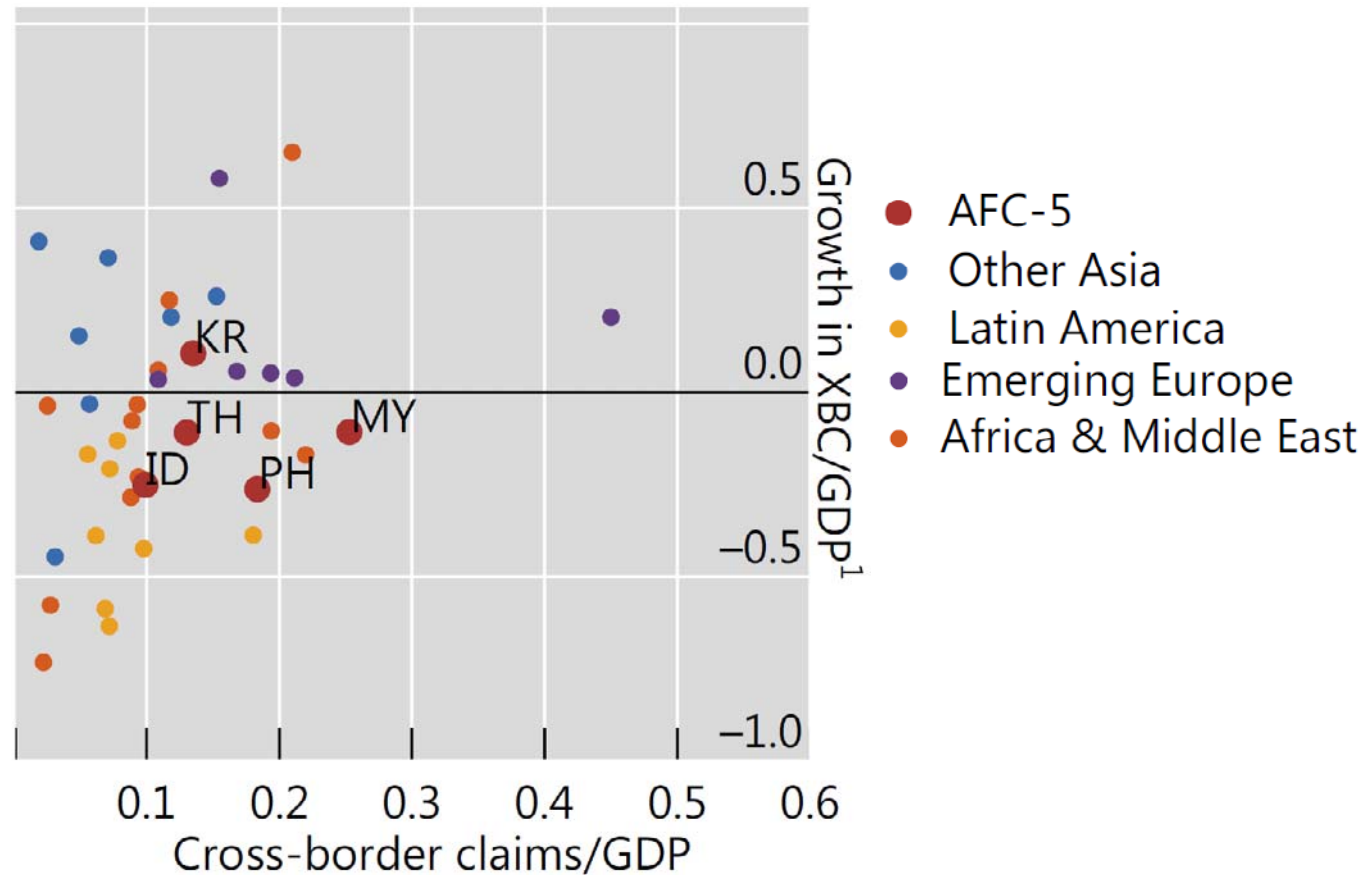
Stock and 12-quarter growth rates, end-June 1999



Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

Cross-border bank claims as share of GDP

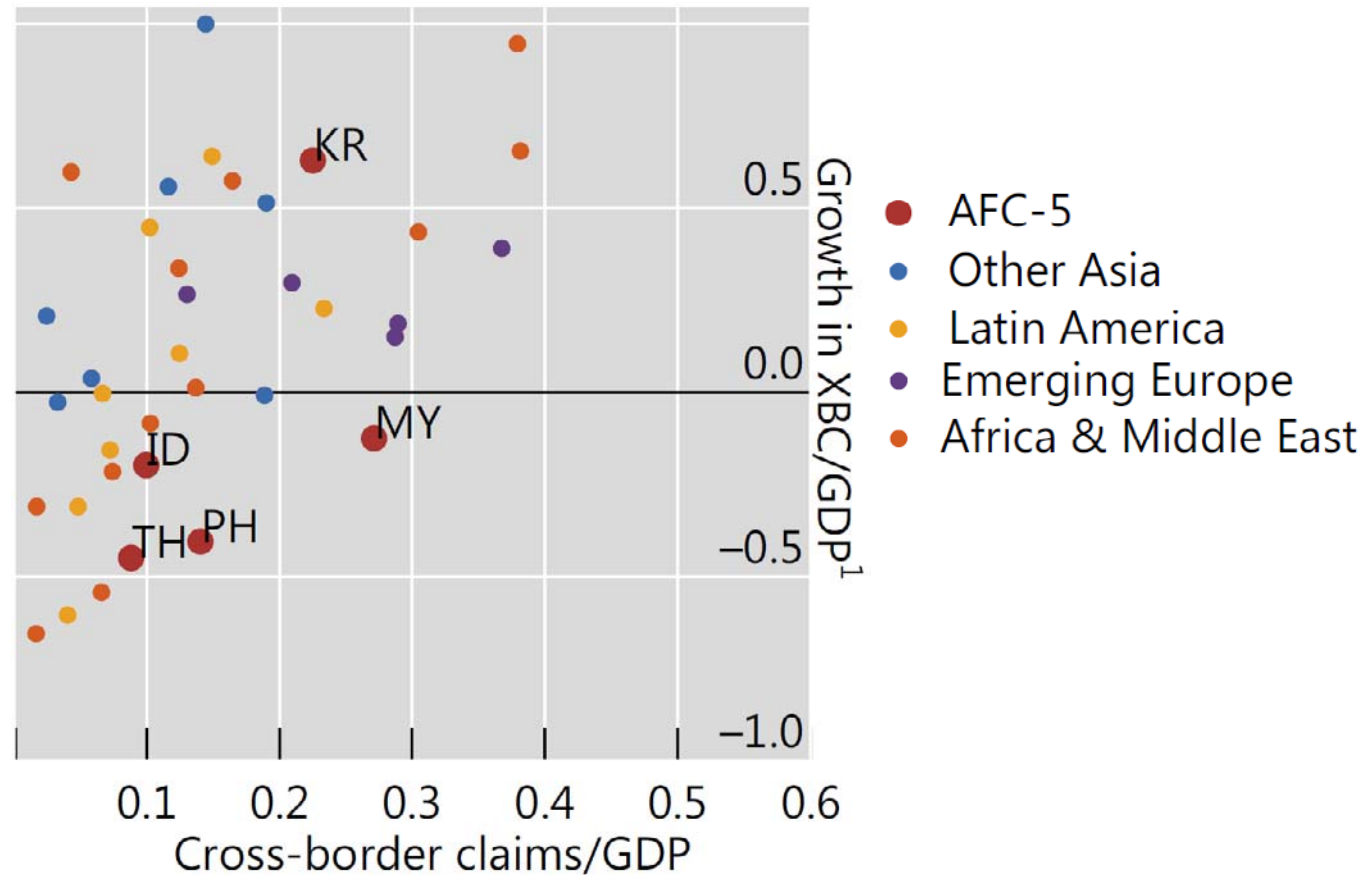
Stock and 12-quarter growth rates, end-June 2006



Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

Cross-border bank claims as share of GDP

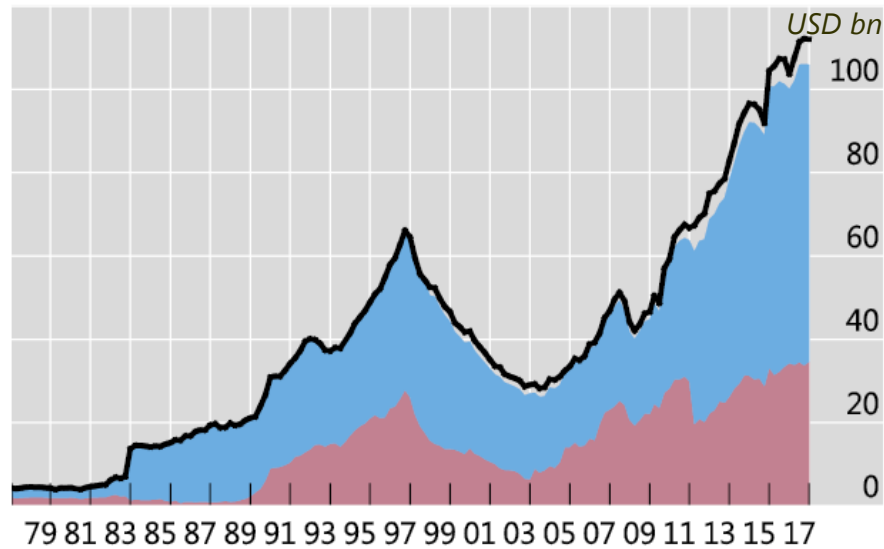
Stock and 12-quarter growth rates, end-June 2008



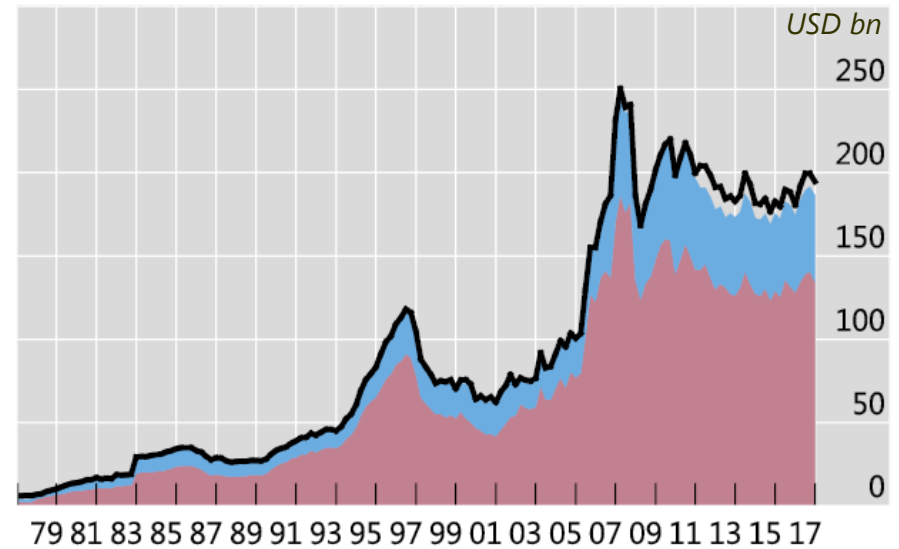
Source: IMF, *World Economic Outlook*; national data; BIS locational banking statistics.

Cross-border claims by counterparty sector

Indonesia



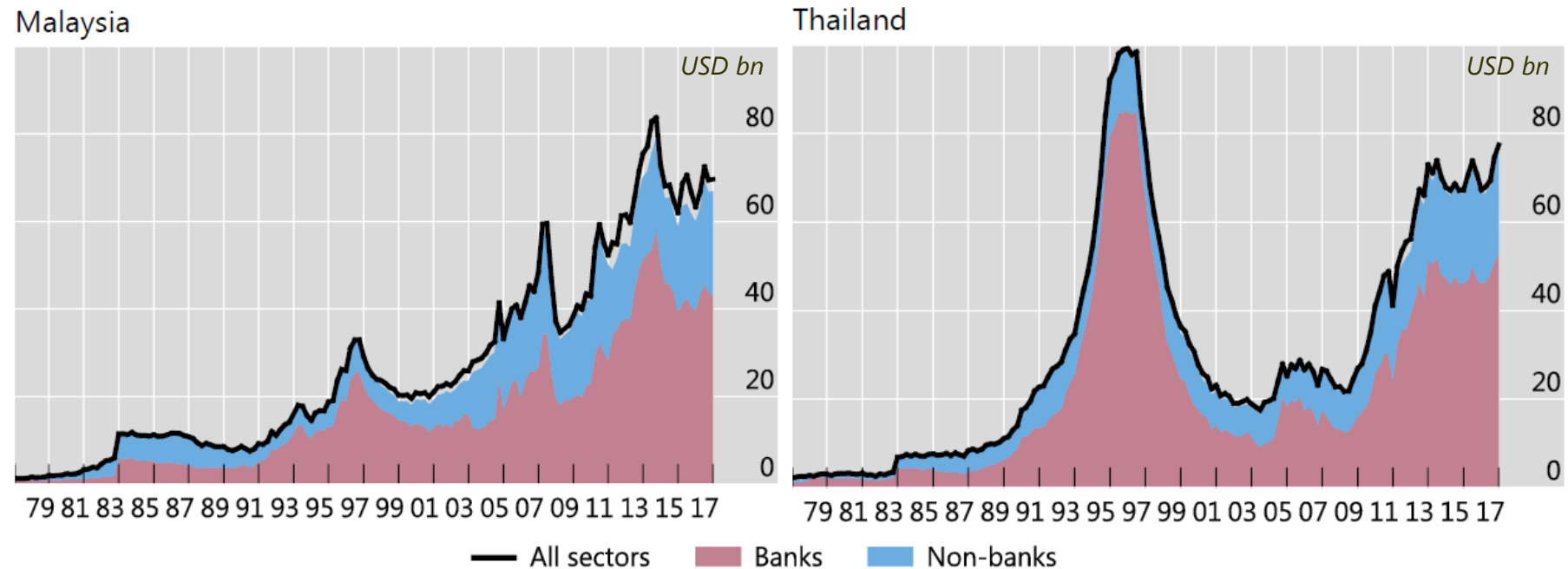
Korea



— All sectors ■ Banks ■ Non-banks

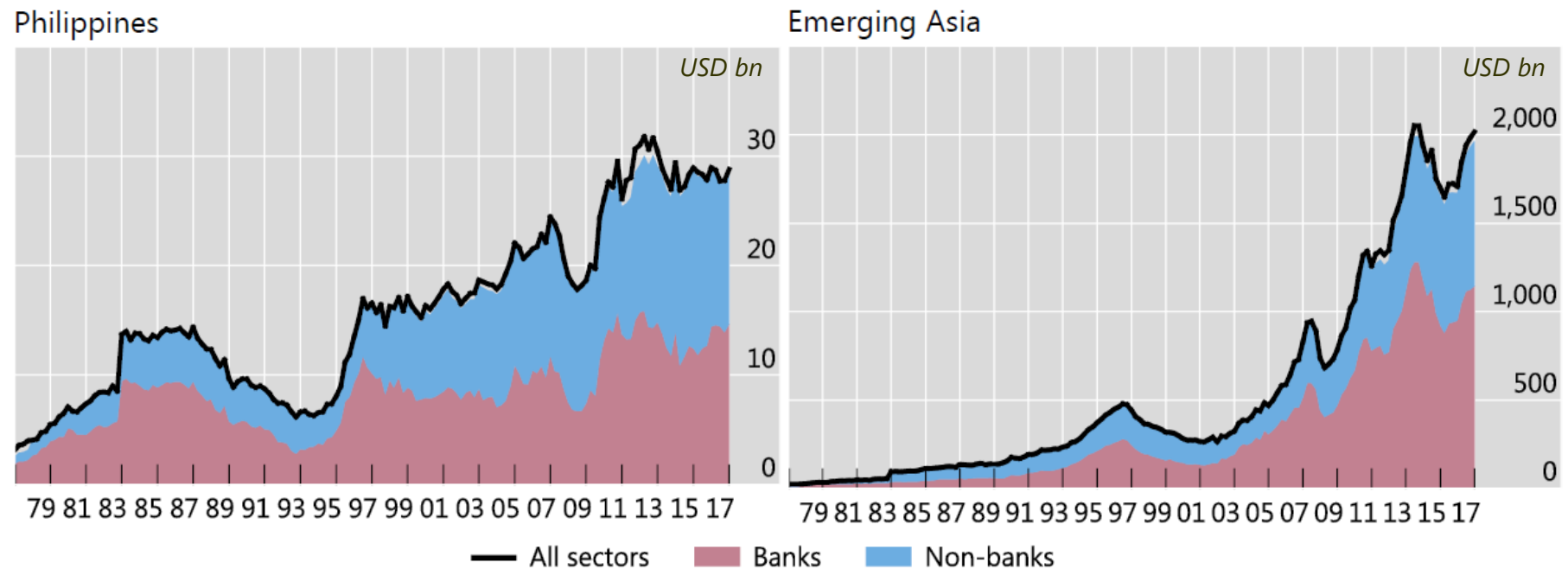
Source: BIS locational banking statistics.

Cross-border claims by counterparty sector



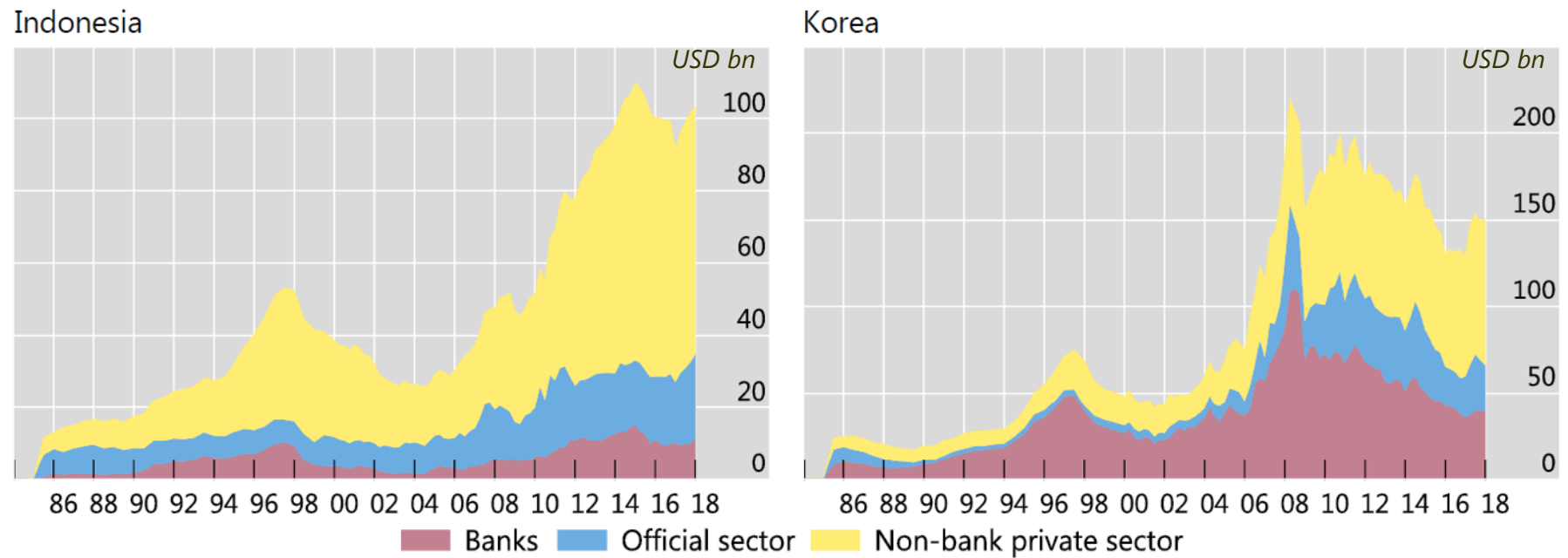
Source: BIS locational banking statistics.

Cross-border claims by counterparty sector



Source: BIS locational banking statistics.

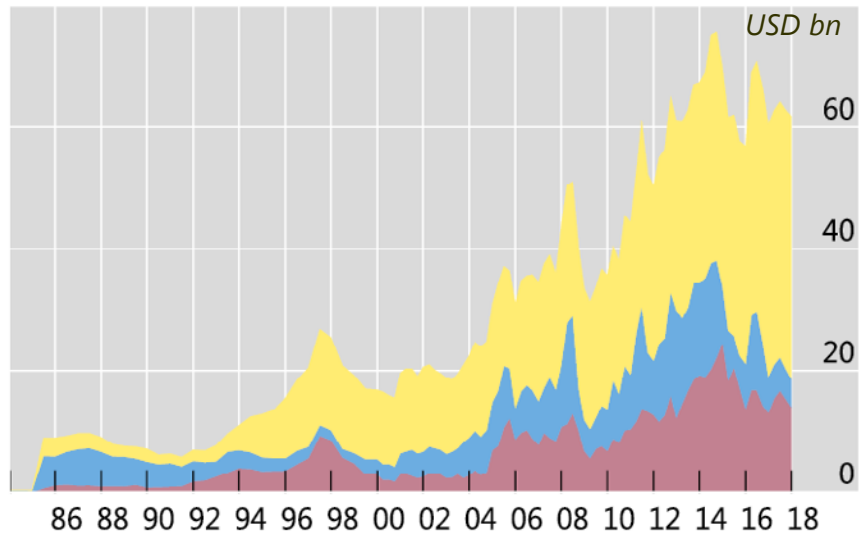
International claims by counterparty sector



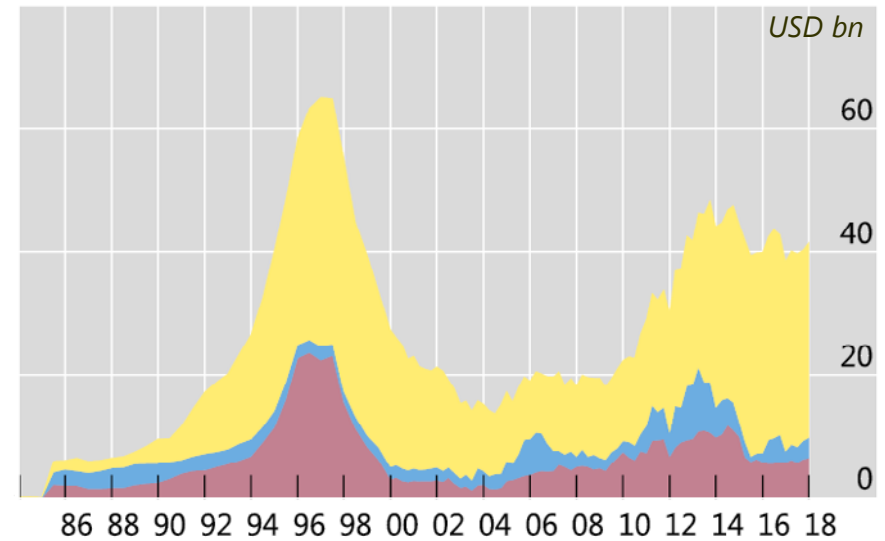
Source: BIS consolidated banking statistics on IC basis.

International claims by counterparty sector

Malaysia



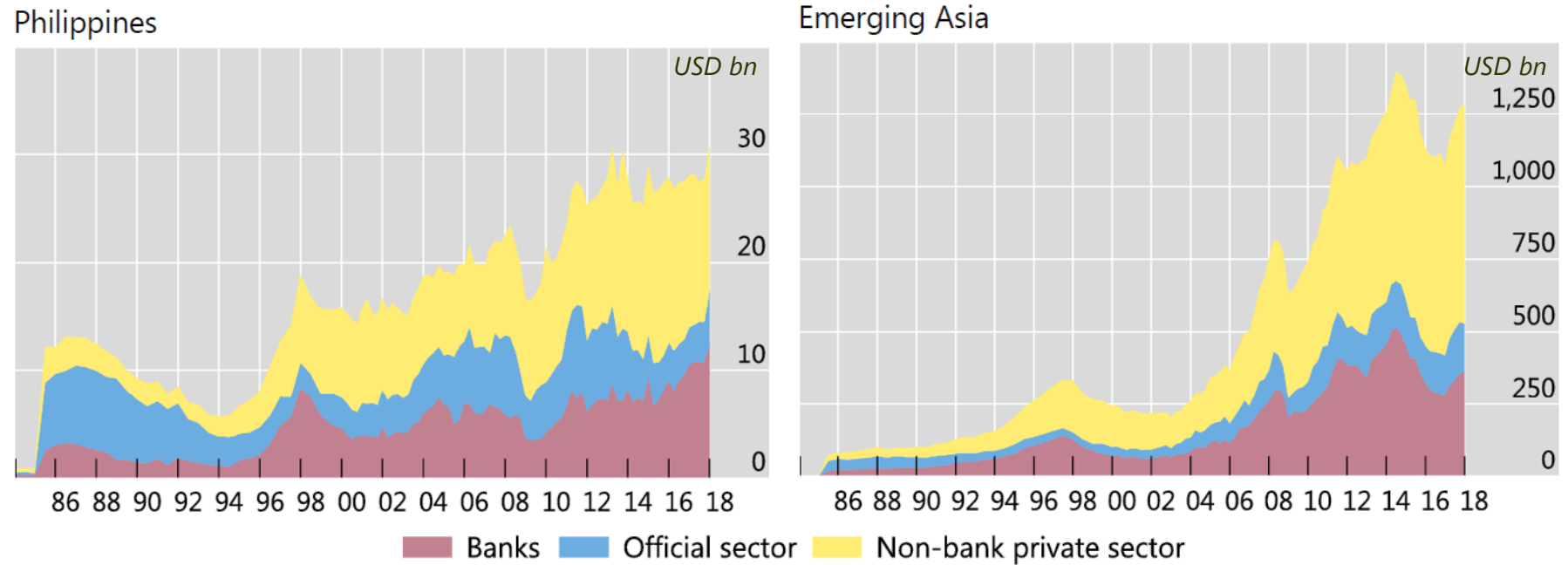
Thailand



■ Banks ■ Official sector ■ Non-bank private sector

Source: BIS consolidated banking statistics on IC basis.

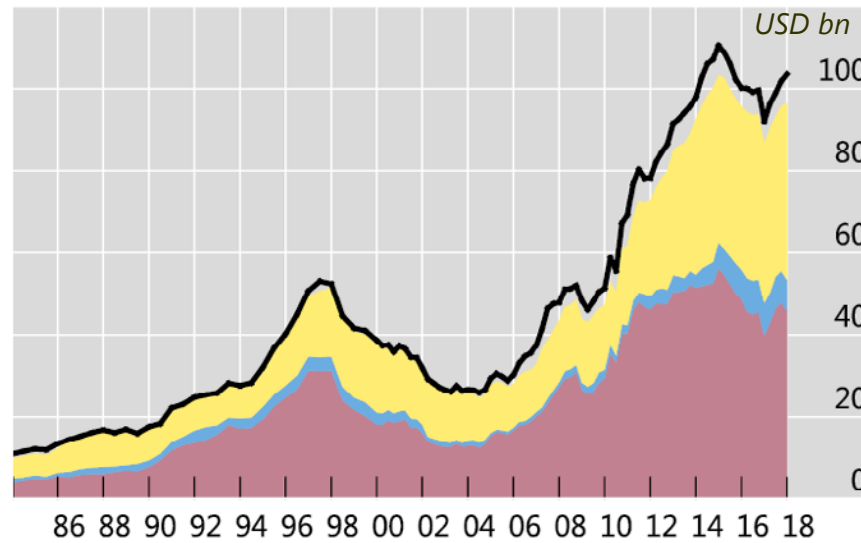
International claims by counterparty sector



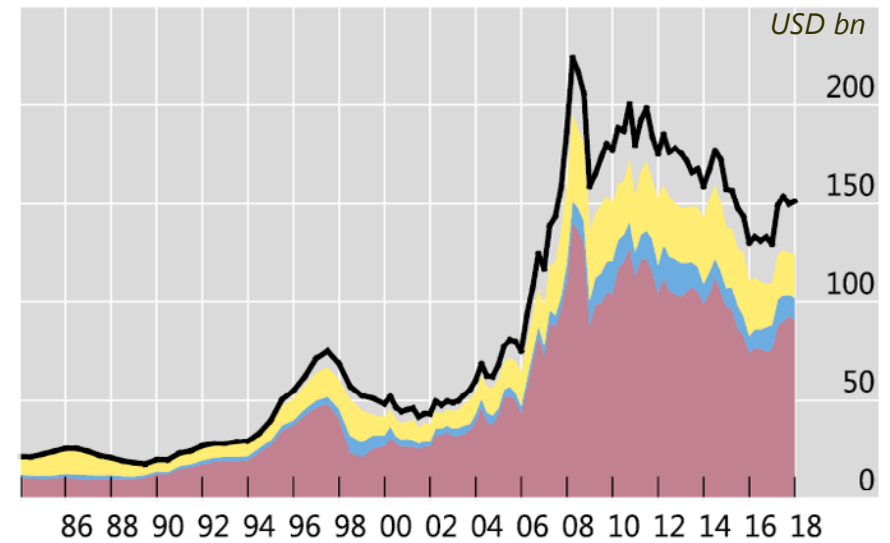
Source: BIS consolidated banking statistics on IC basis.

International claims by maturity

Indonesia



Korea

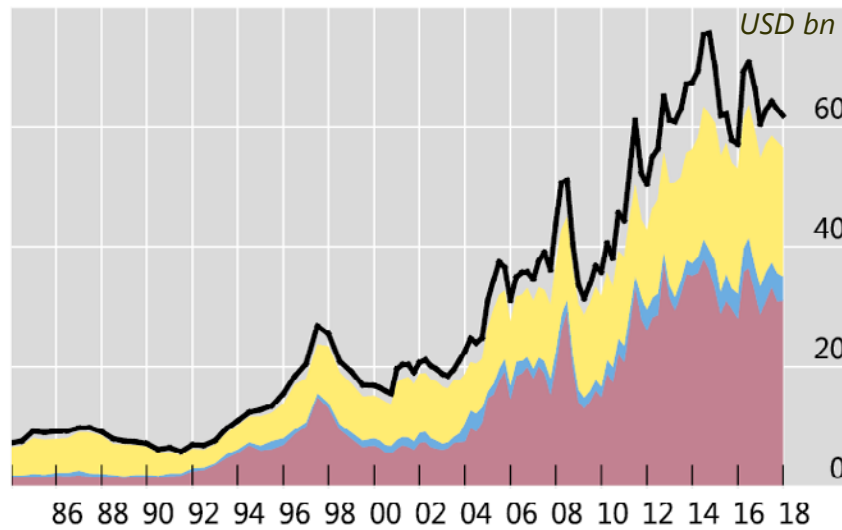


— All maturities ≤1yr >1yr to ≤2yrs >2yrs

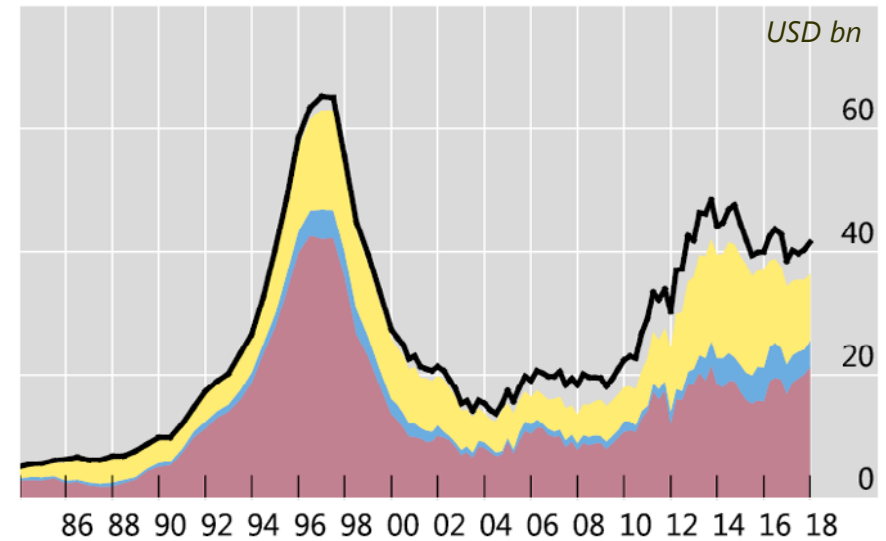
Source: BIS consolidated banking statistics on IC basis.

International claims by maturity

Malaysia



Thailand

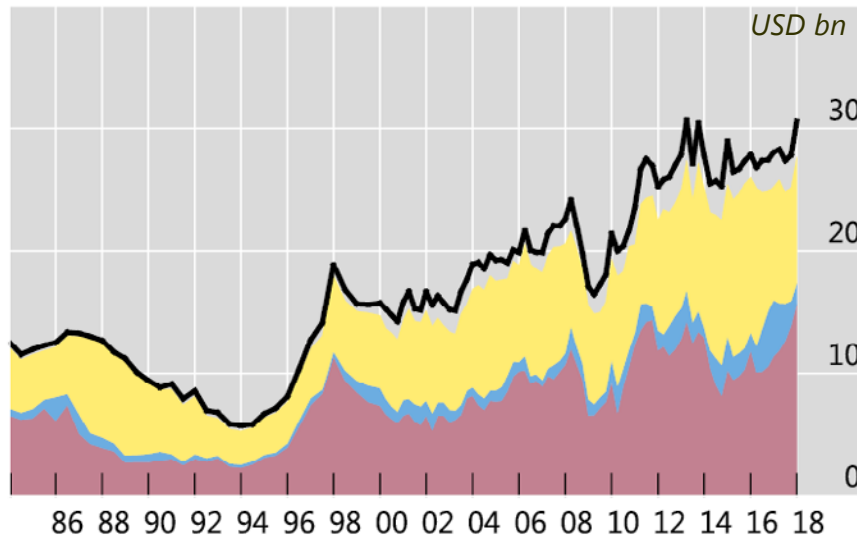


— All maturities ≤1yr >1yr to ≤2yrs >2yrs

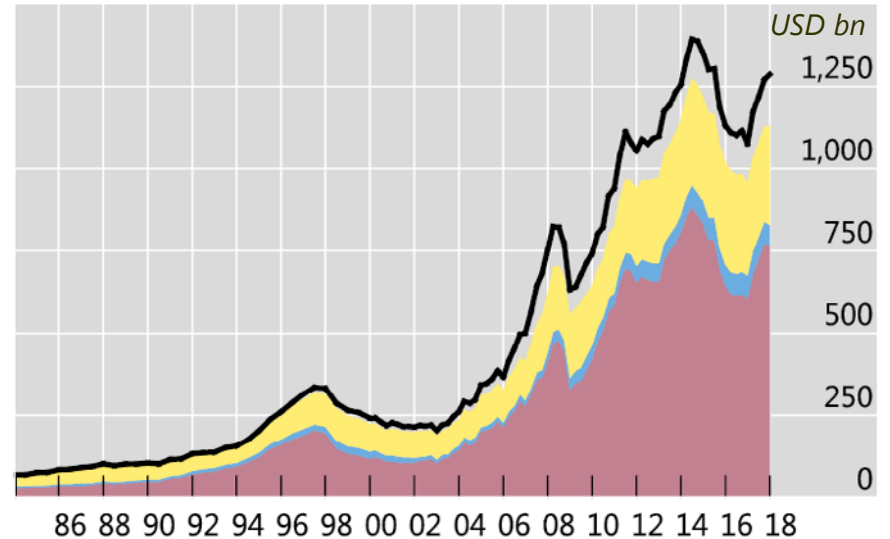
Source: BIS consolidated banking statistics on IC basis.

International claims by maturity

Philippines



Emerging Asia

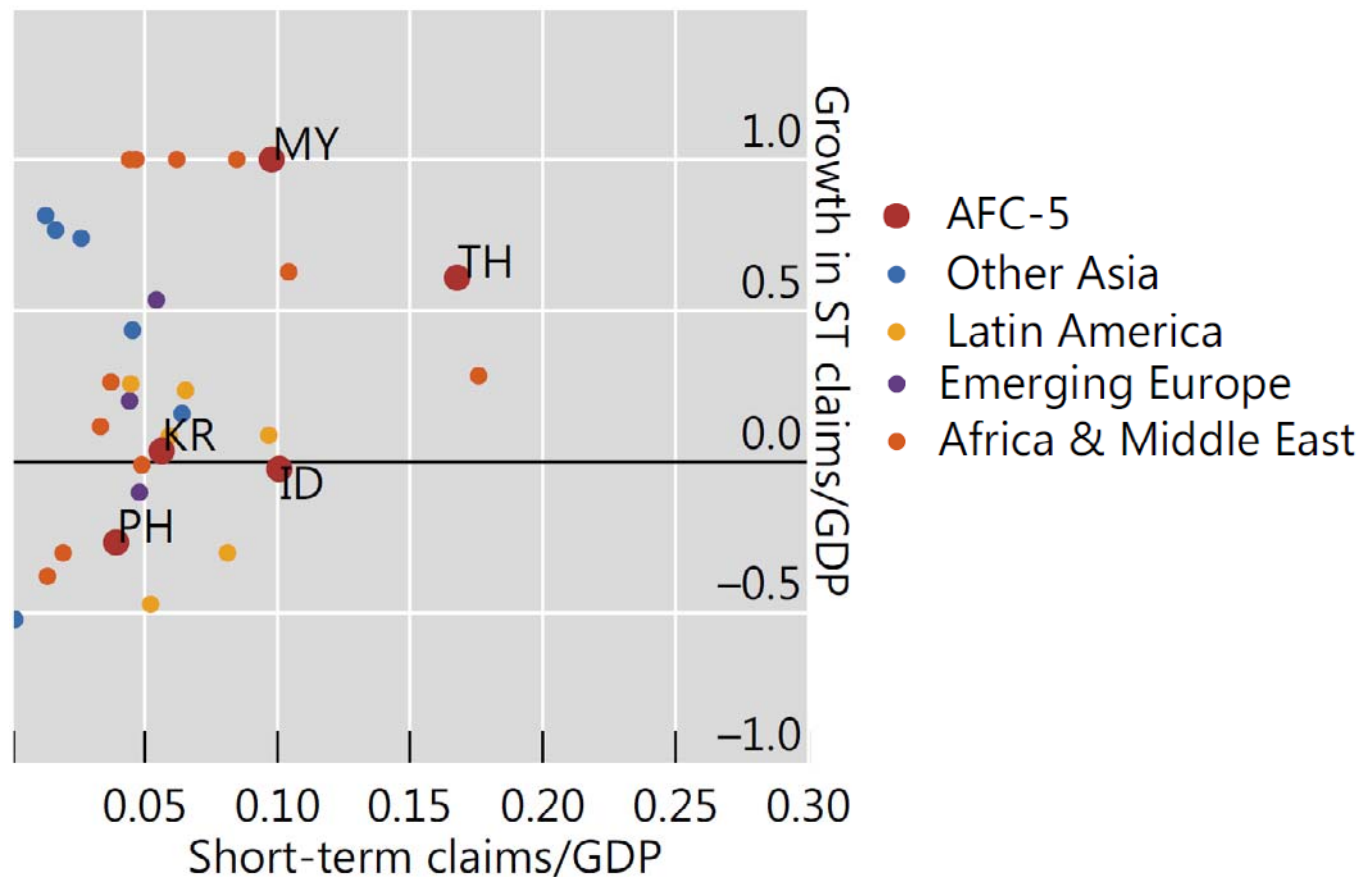


— All maturities ≤1yr >1yr to ≤2yrs >2yrs

Source: BIS consolidated banking statistics on IC basis.

Short-term international bank claims as a share of GDP

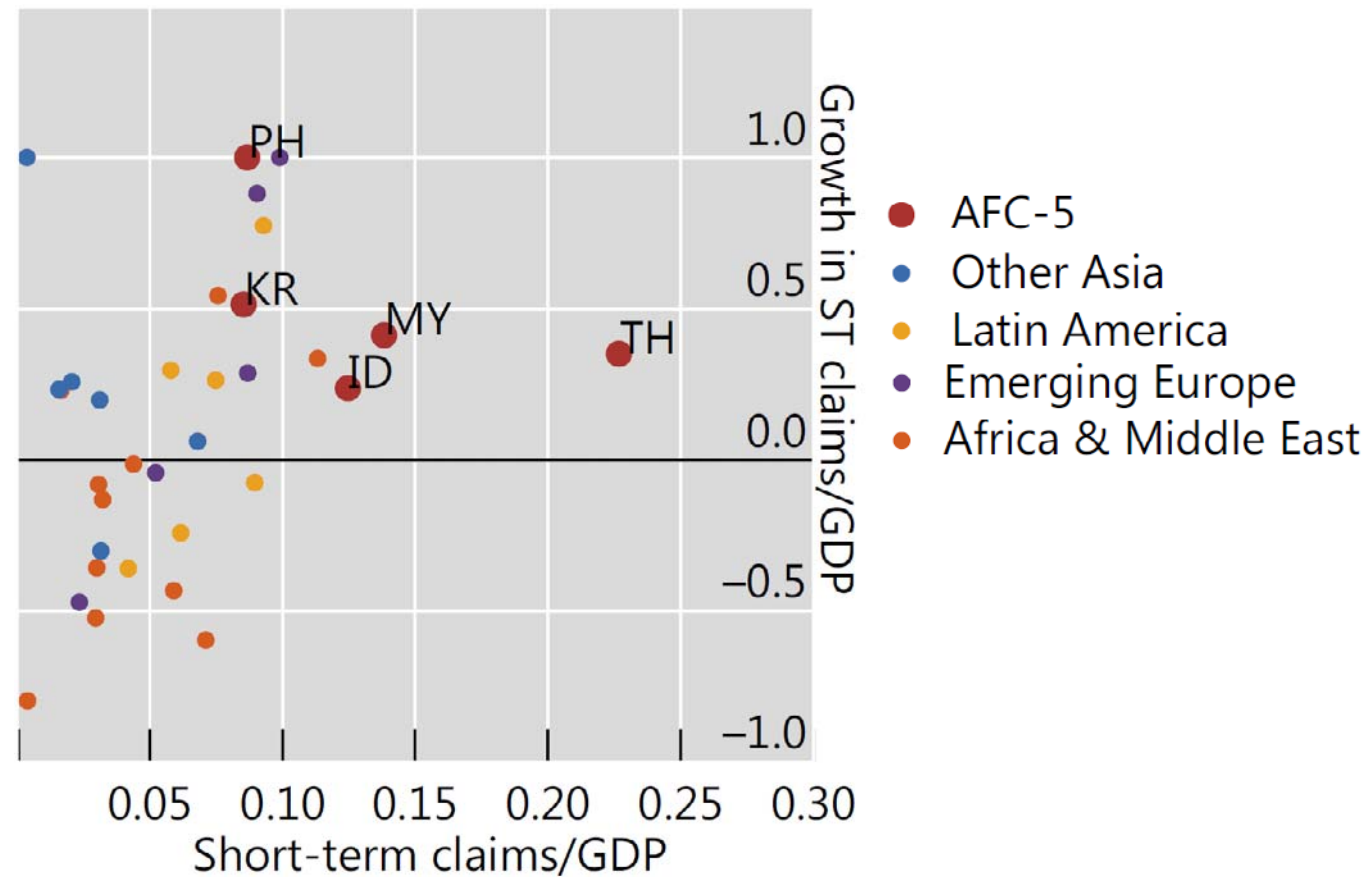
Stock and 12-quarter growth rates, end-June 1994



Source: IMF, *World Economic Outlook*; national data; BIS consolidated banking statistics.

Short-term international bank claims as a share of GDP

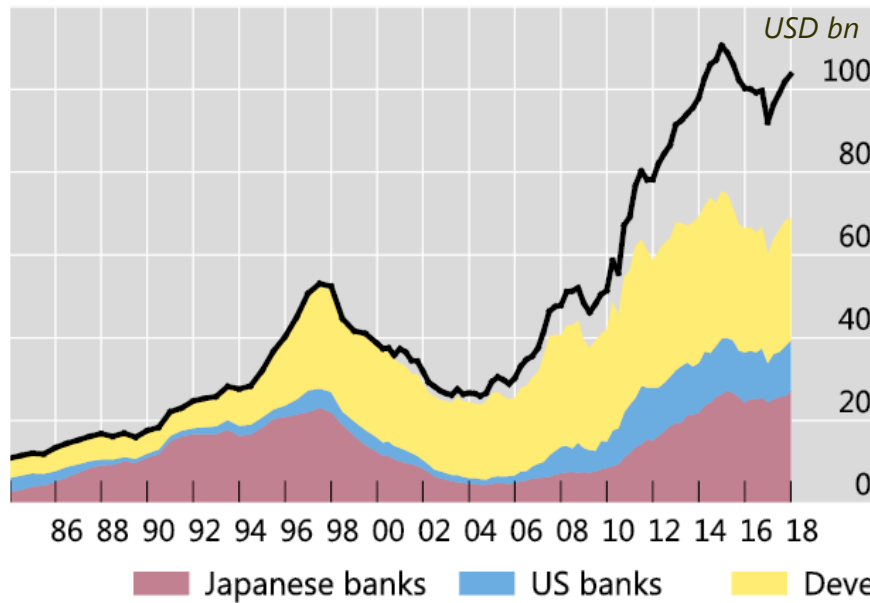
Stock and 12-quarter growth rates, end-June 1997



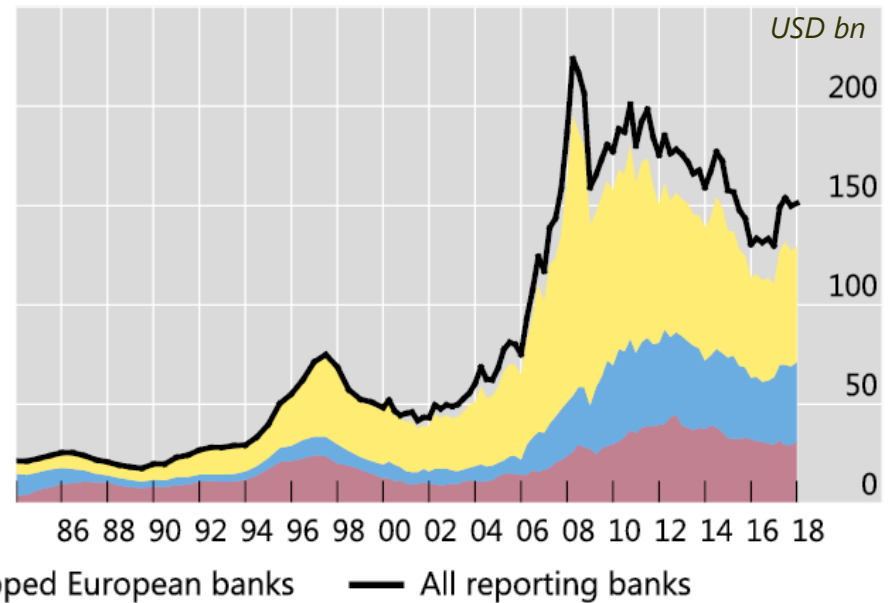
Source: IMF, *World Economic Outlook*; national data; BIS consolidated banking statistics.

International claims on Emerging Asia, by lending banking system

Indonesia



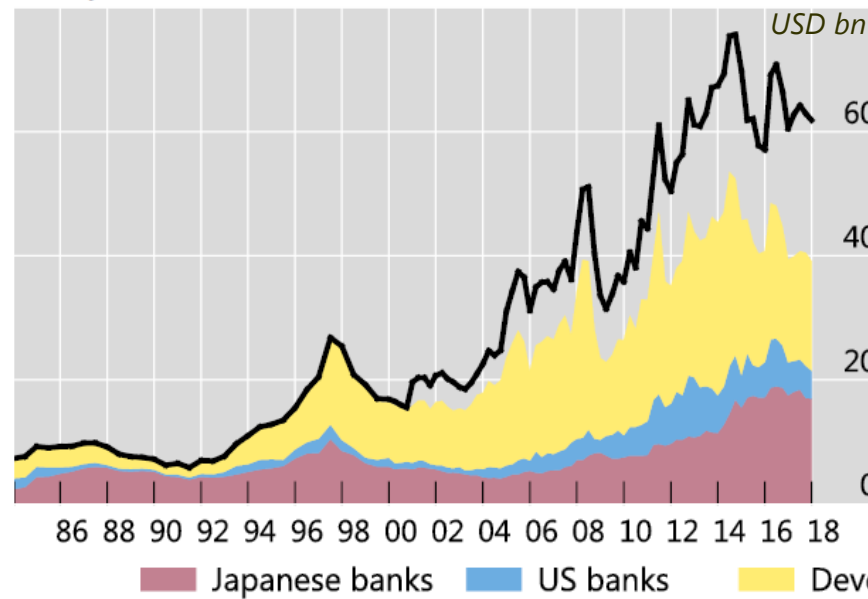
Korea



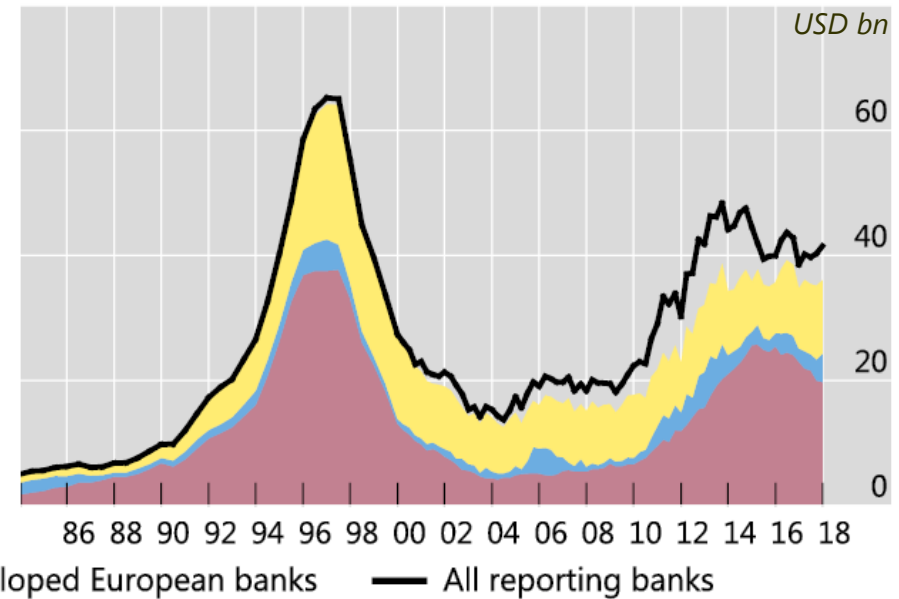
Source: BIS consolidated banking statistics on IC basis.

International claims on Emerging Asia, by lending banking system

Malaysia



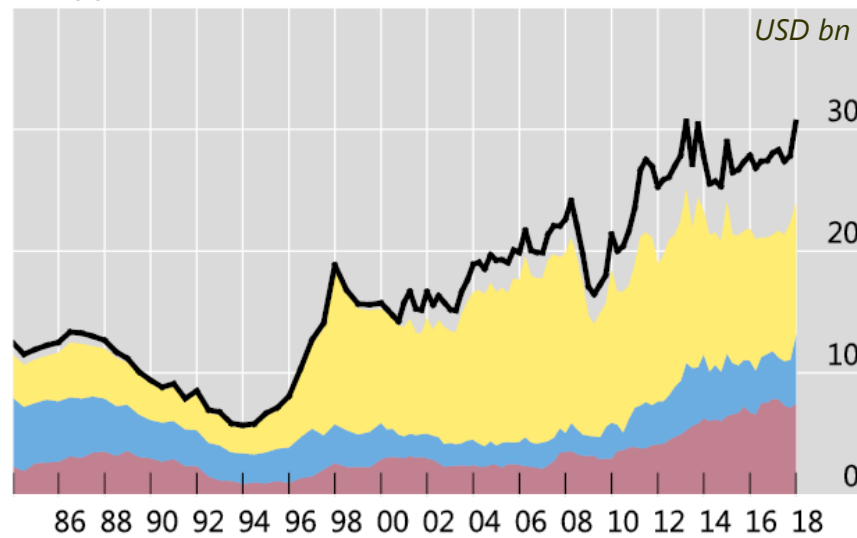
Thailand



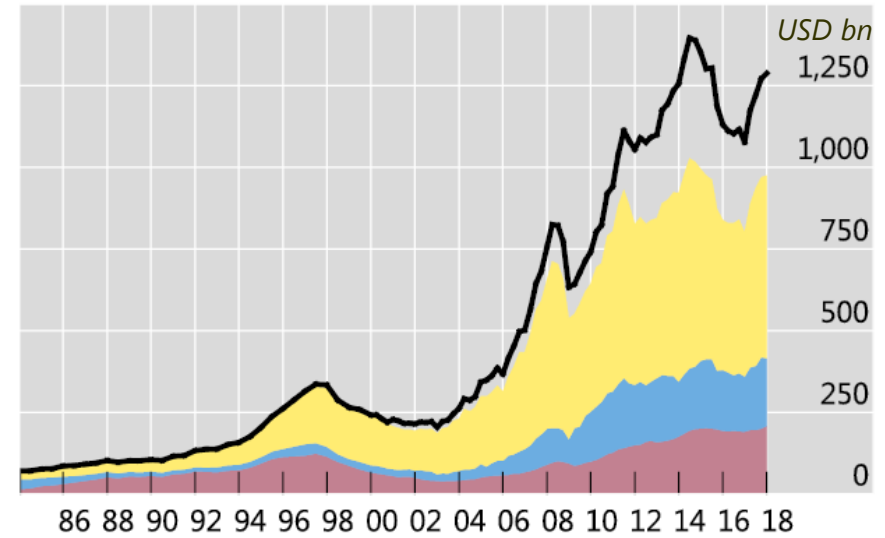
Source: BIS consolidated banking statistics on IC basis.

International claims on Emerging Asia, by lending banking system

Philippines



Emerging Asia

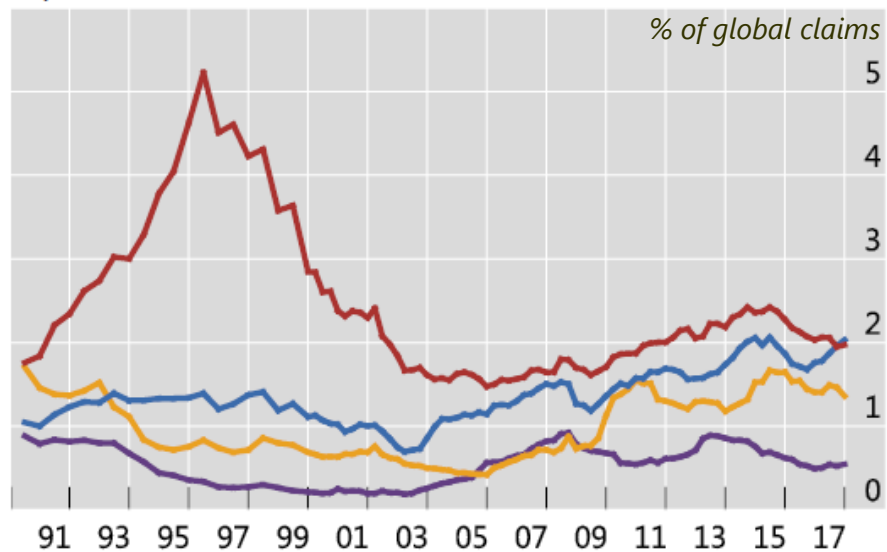


Japanese banks US banks Developed European banks All reporting banks

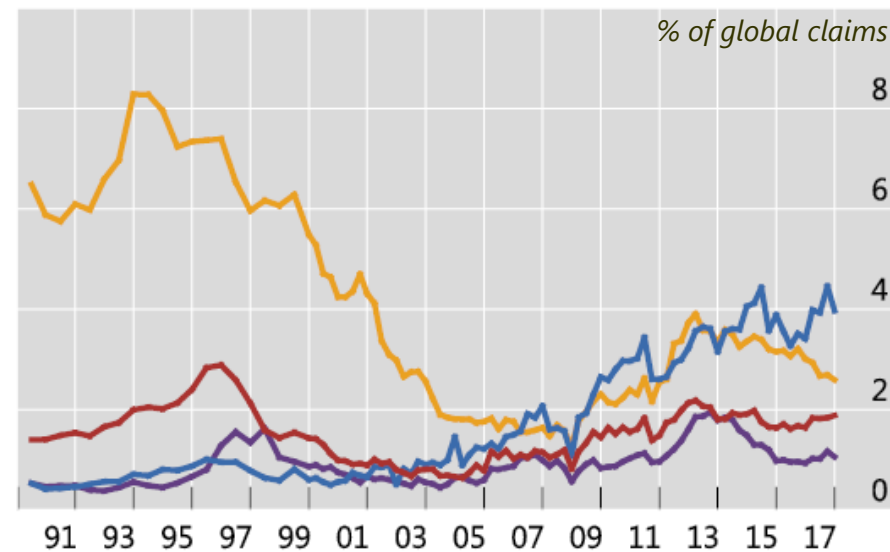
Source: BIS consolidated banking statistics on IC basis.

International claims, by borrowing country group

Japanese banks



US banks

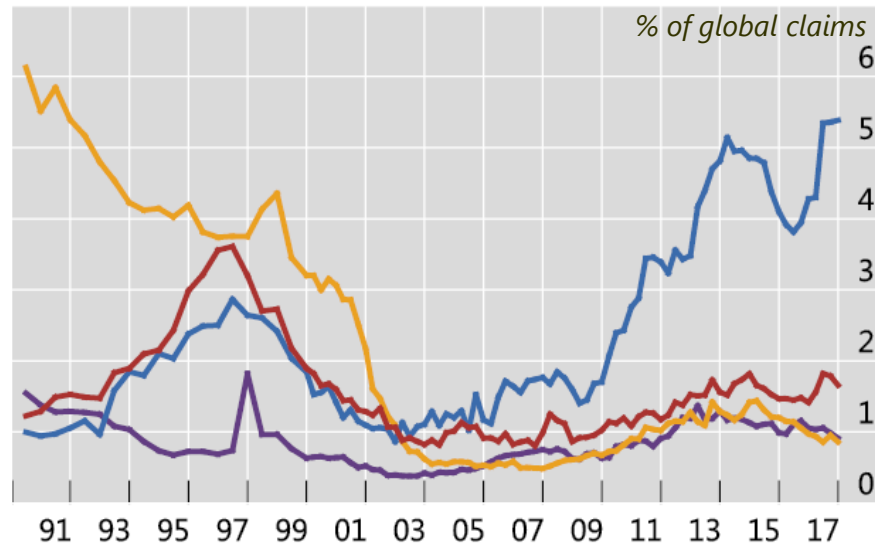


— AFC-5 — Other Asia — Latin America — Emerging Europe

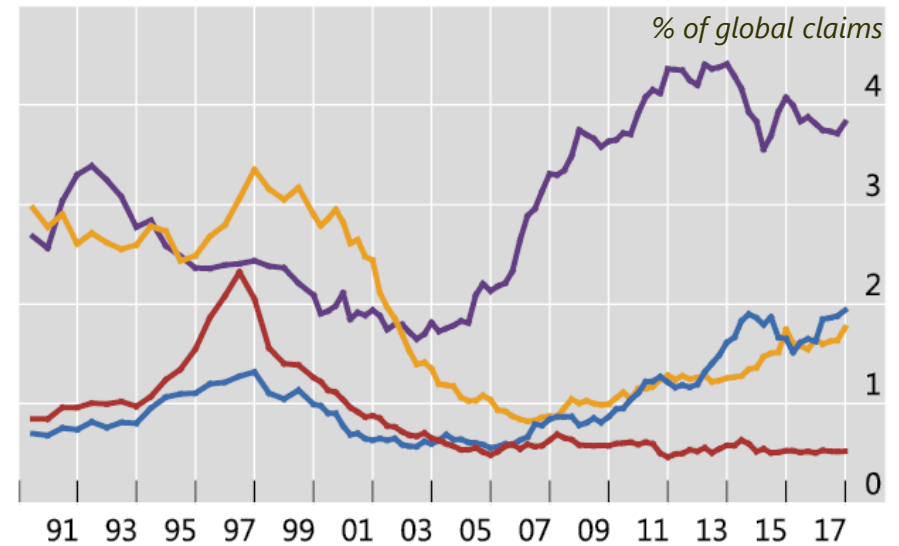
Sources: BIS locational and consolidated banking statistics on IC basis.

International claims, by borrowing country group

UK banks



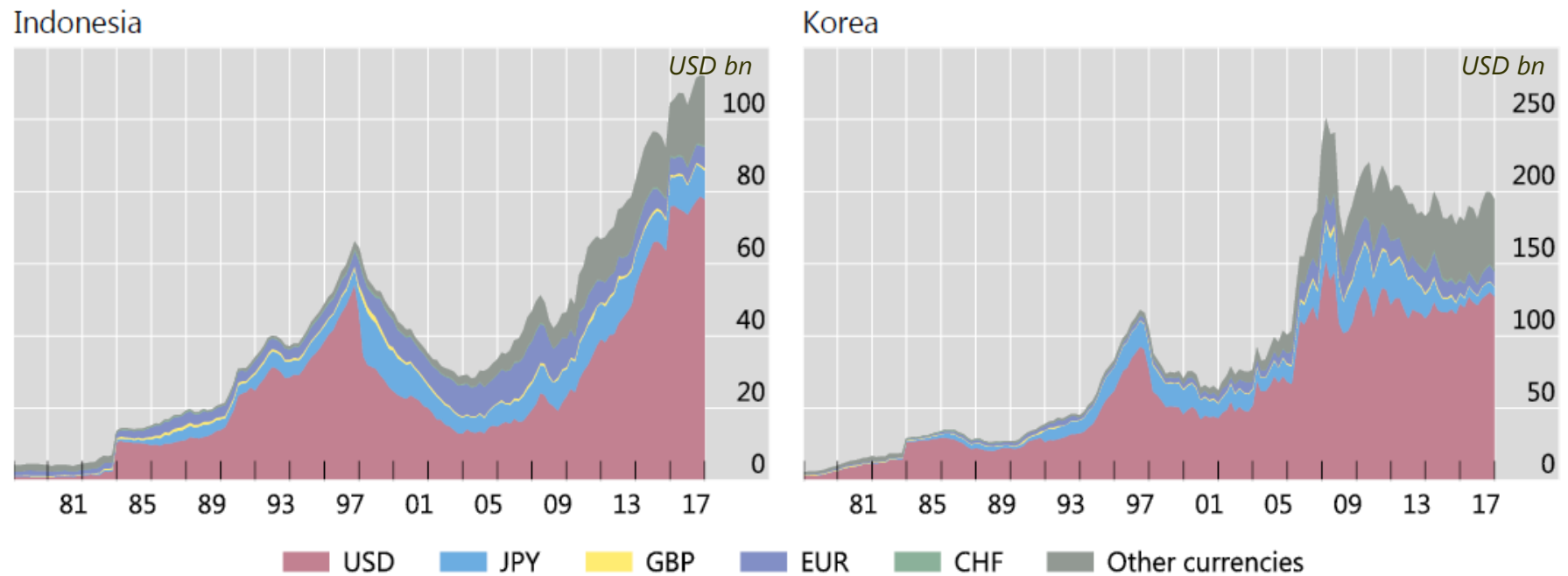
Euro area banks



— AFC-5 — Other Asia — Latin America — Emerging Europe

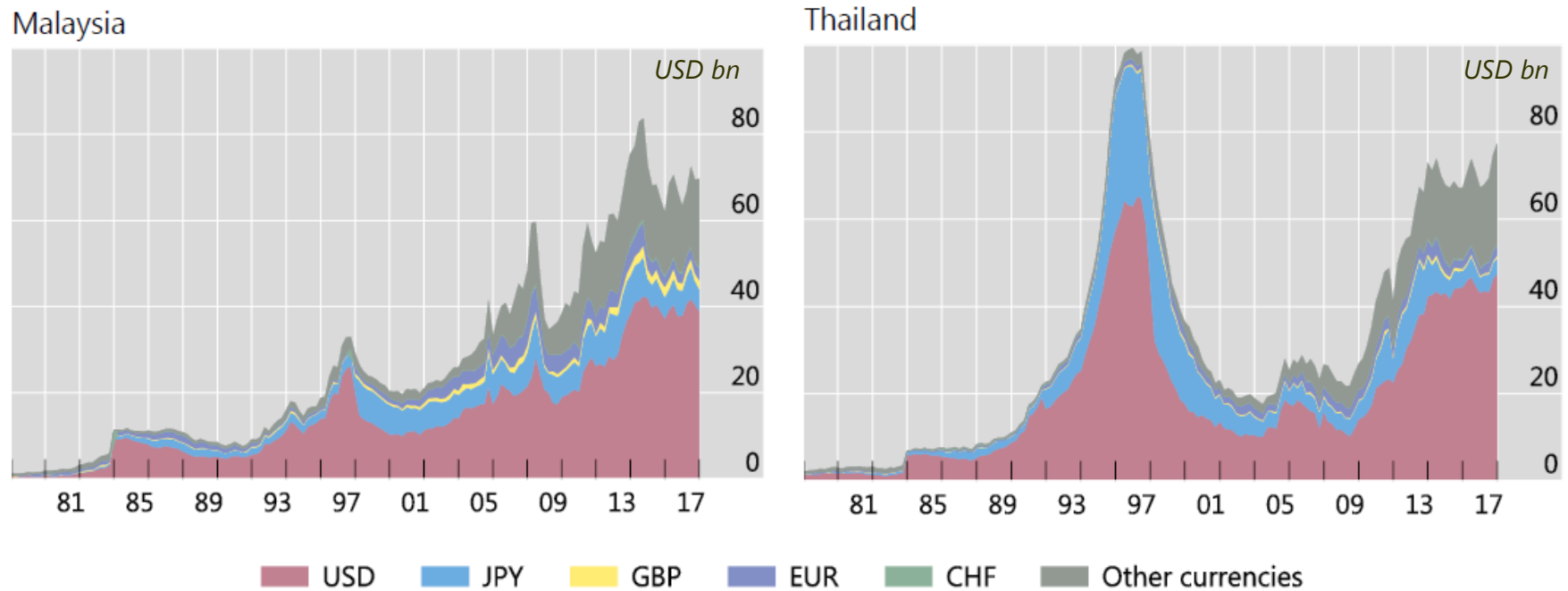
Sources: BIS locational and consolidated banking statistics on IC basis.

Cross-border claims, by currency



Source: BIS locational banking statistics.

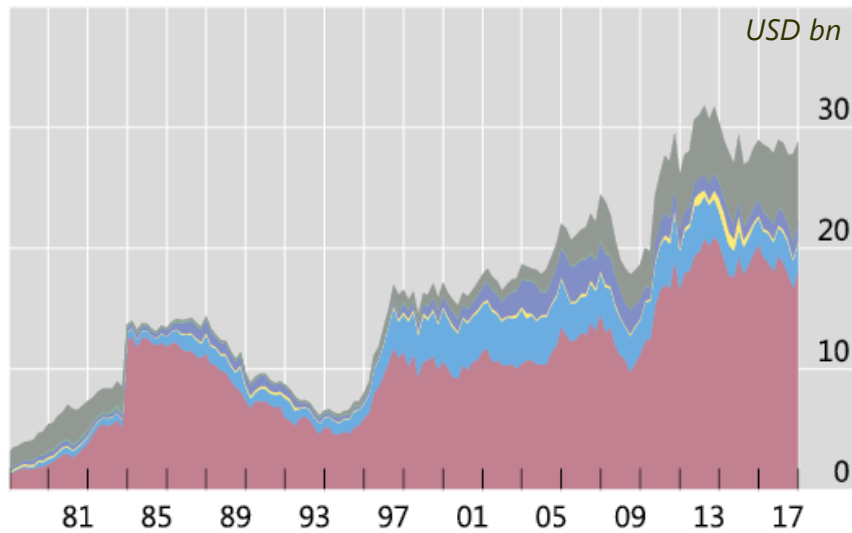
Cross-border claims, by currency



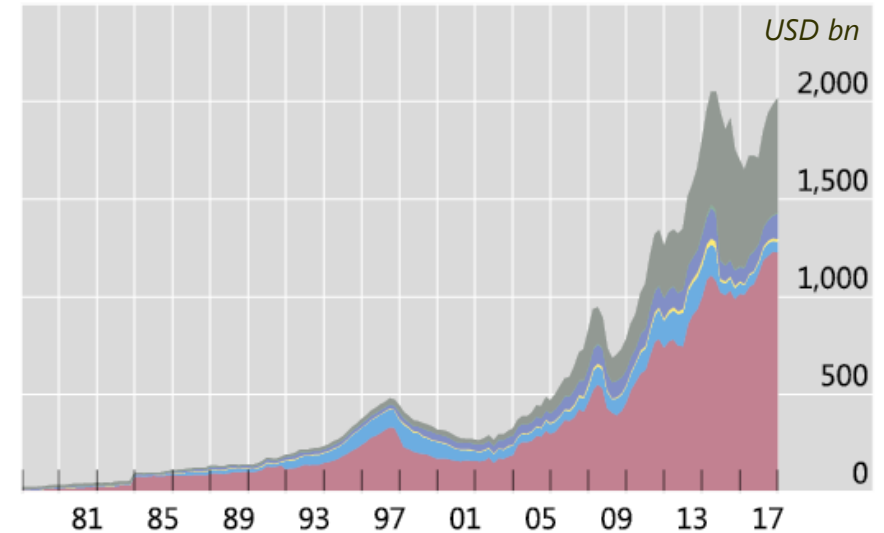
Source: BIS locational banking statistics.

Cross-border claims, by currency

Philippines



Emerging Asia



USD JPY GBP EUR CHF Other currencies

Source: BIS locational banking statistics.



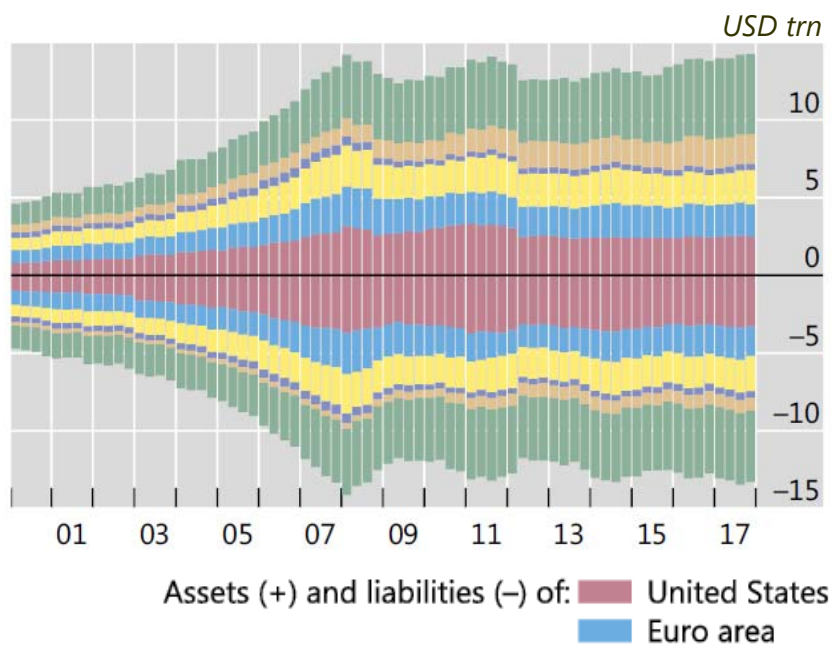
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Global dimension

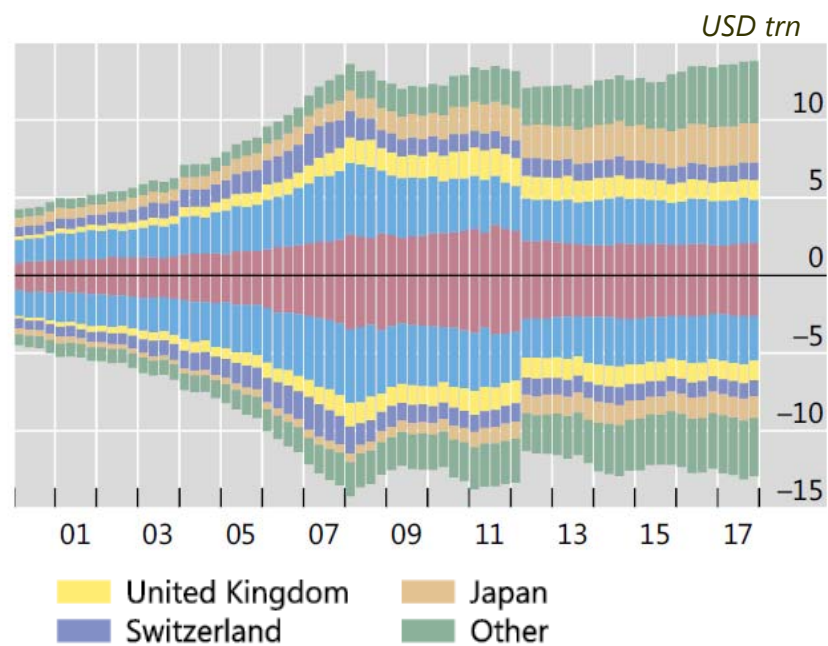


US dollar-denominated cross-border credit

By residence



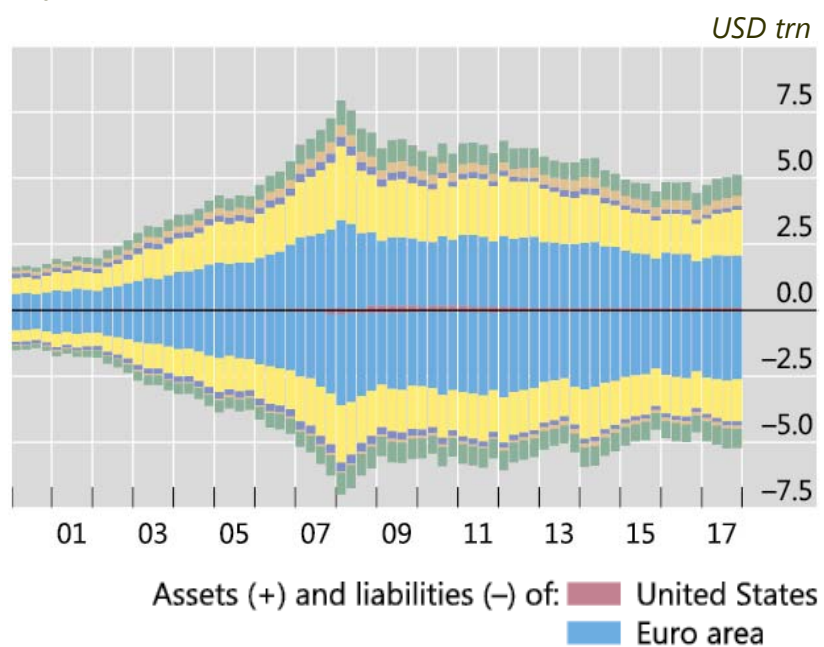
By nationality



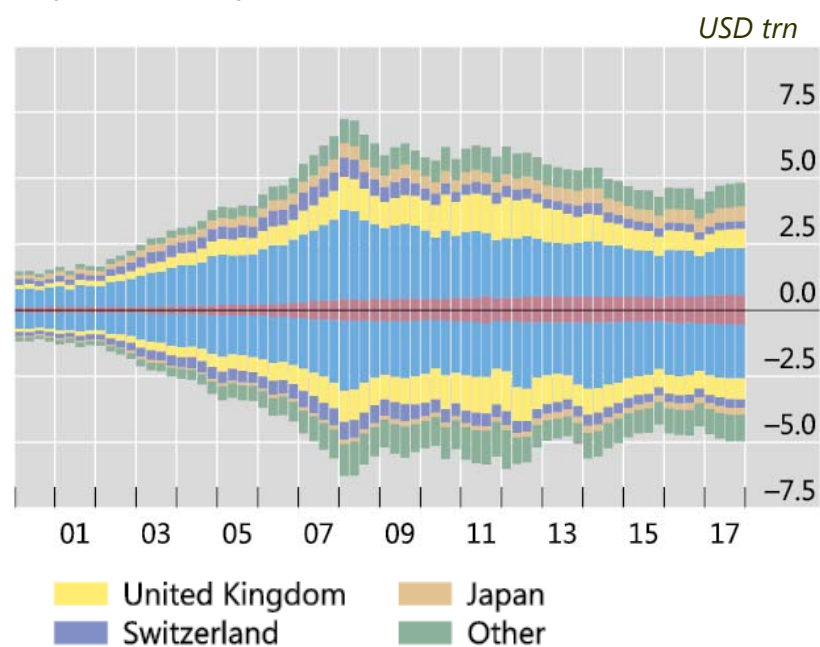
Source: BIS locational banking statistics.

Euro-denominated cross-border credit

By residence



By nationality

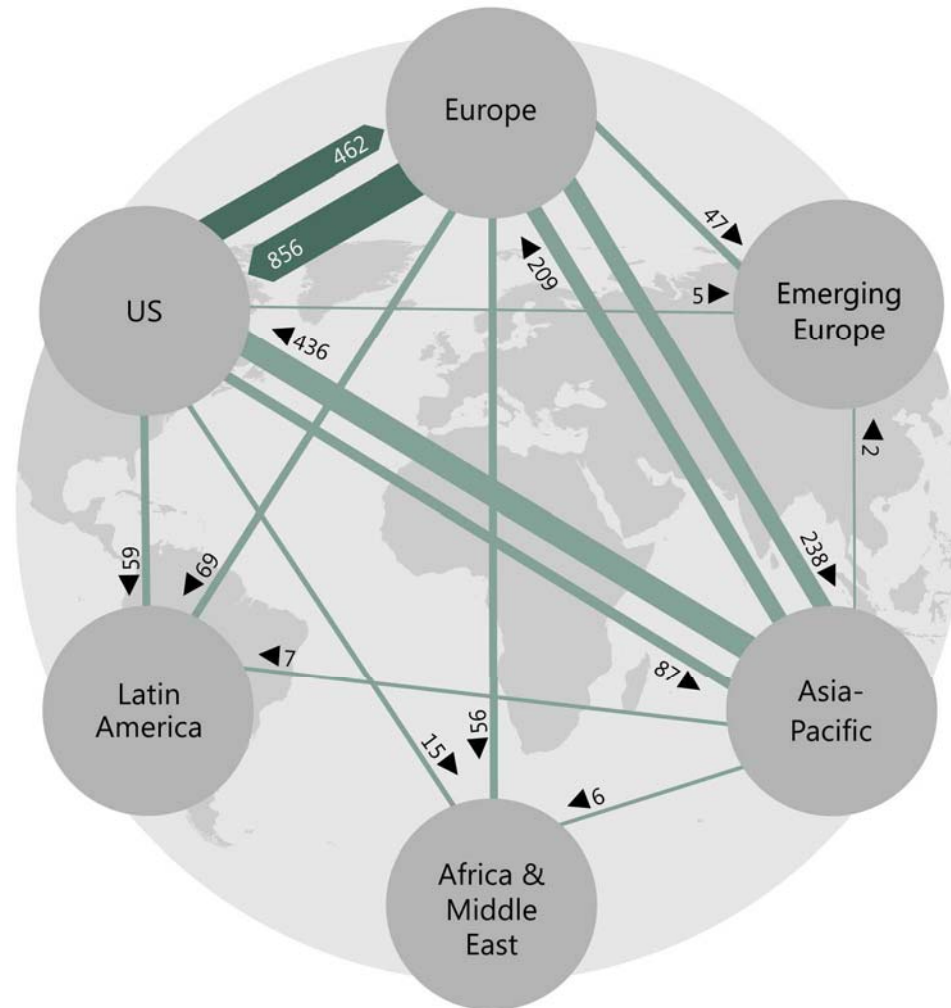


Source: BIS locational banking statistics.

US dollar-denominated cross-border bank claims

In USD billions

2002

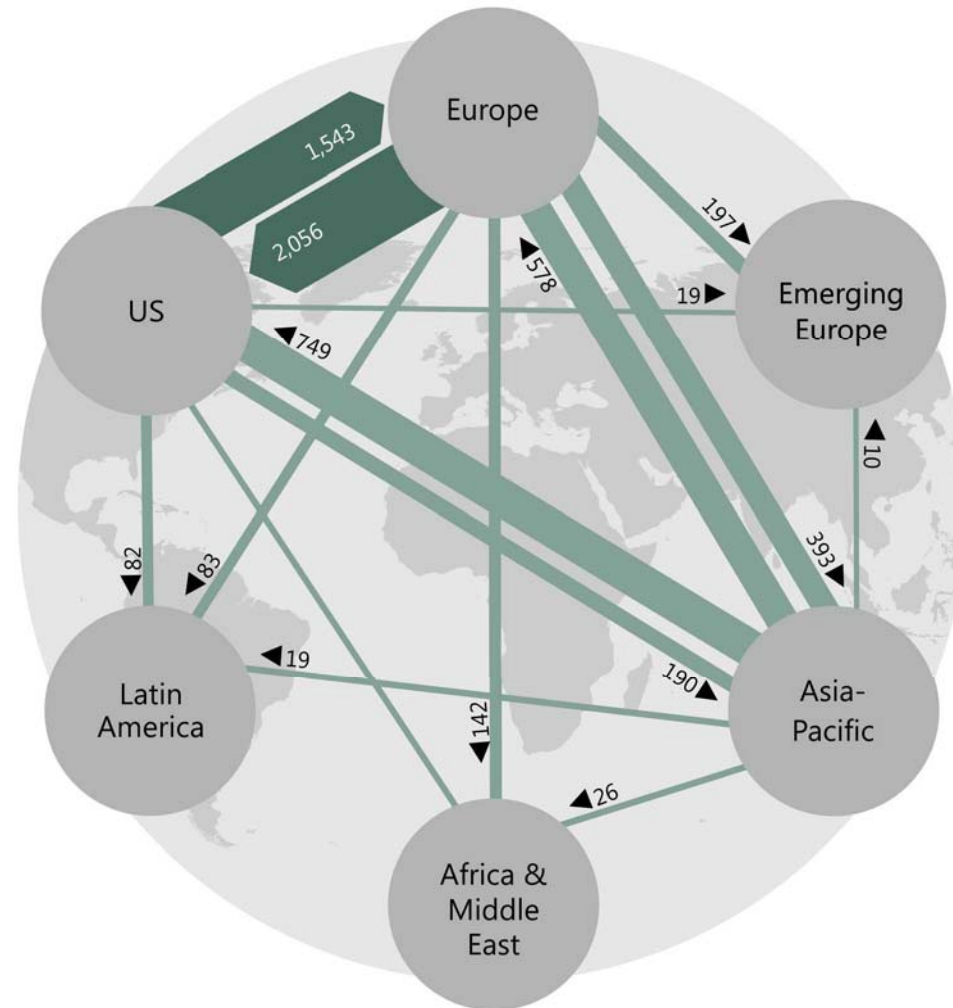


Source: BIS locational banking statistics by residence.

US dollar-denominated cross-border bank claims

In USD billions

2007



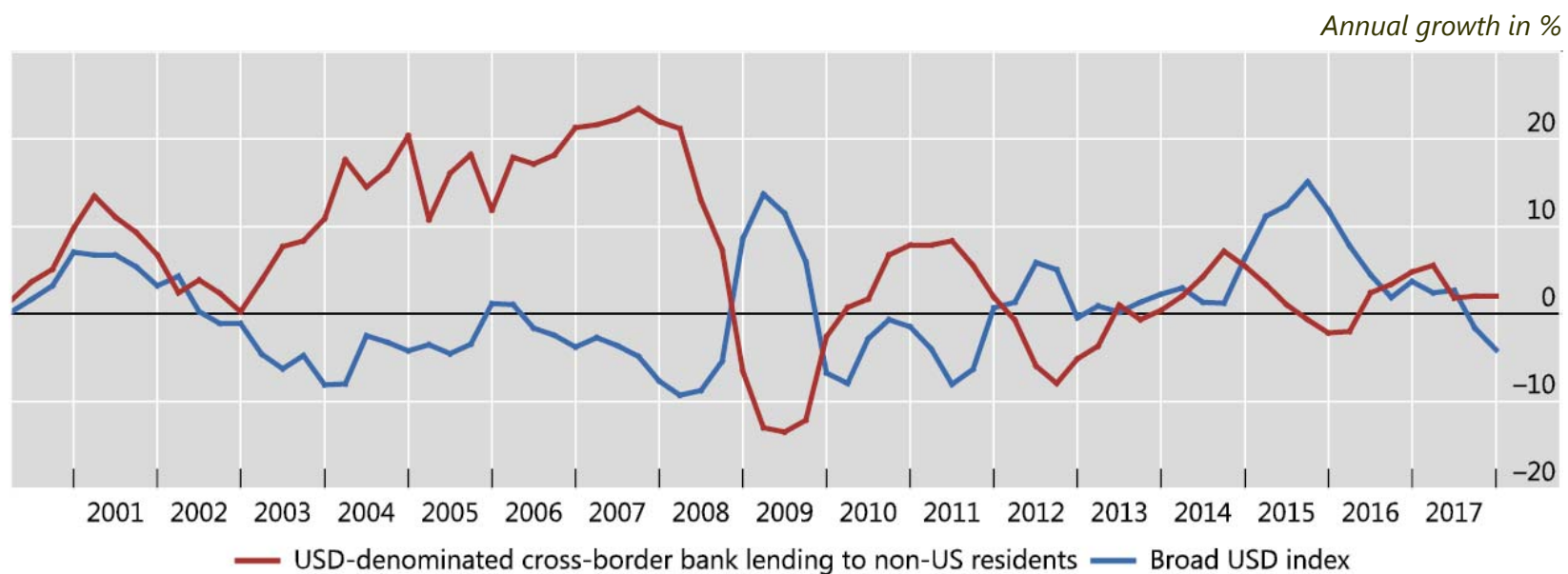
Source: BIS locational banking statistics by residence.



Exchange rates and banking flows



Growth of USD-denominated cross-border bank lending and the broad USD index

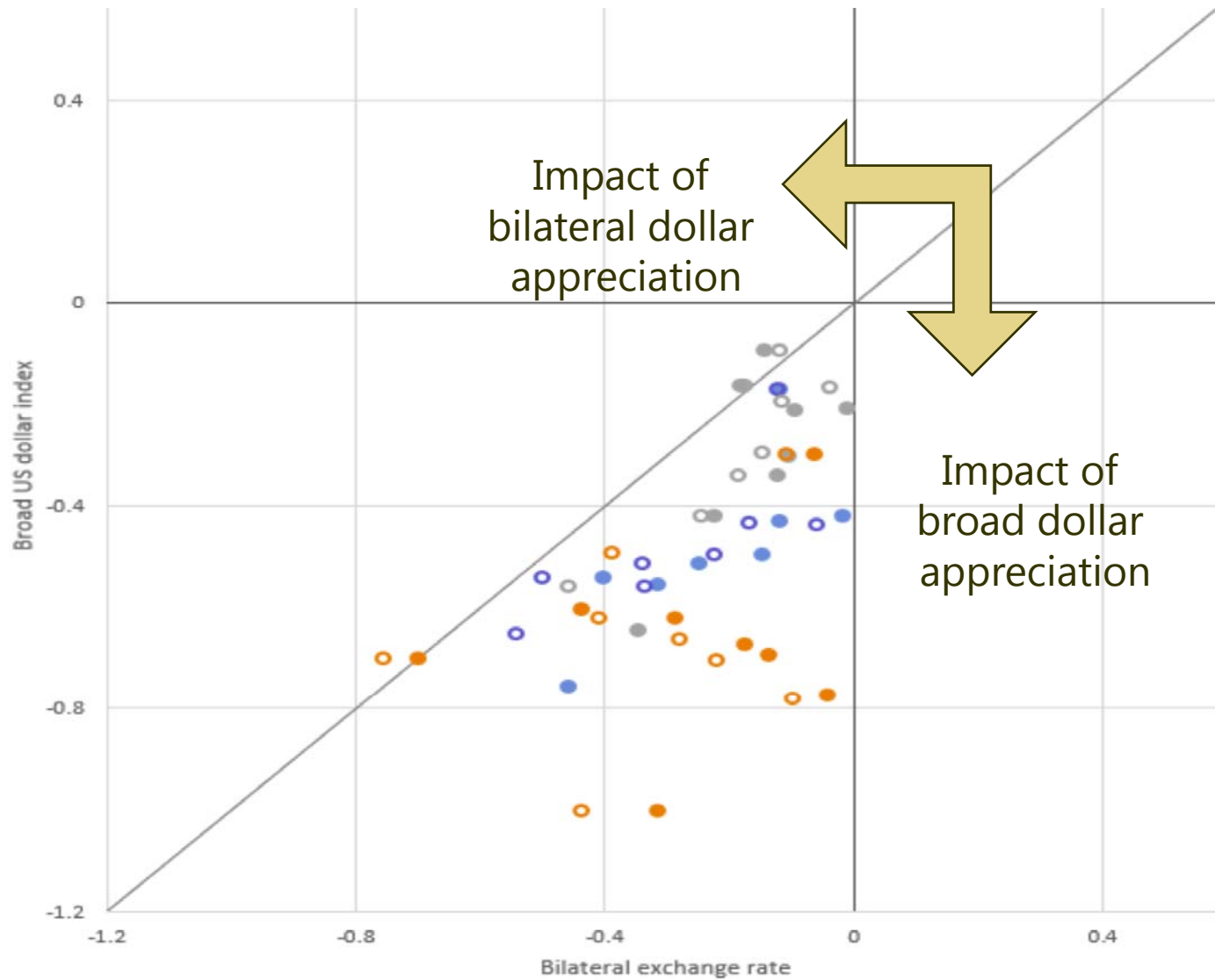


Source: BIS locational banking statistics and nominal effective exchange rate indices.

Why broad dollar index?

- 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](#).

Panel regression coefficients for bank capital flows



Broad dollar index, bond fund flows and spreads

Dependent variable: bond purchase/TNA	27 int'l currency gov't bond funds investing in 20 EMEs					30 local currency gov't bond funds investing in 20 EMEs				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
$\Delta\log(\text{BER})$ t-1	0.033*** (8.59)		0.014*** (3.62)	0.034*** (8.63)		0.019*** (4.55)		0.010* (1.93)	0.020*** (4.86)	
$\Delta\log(\text{dollar index})$ t-1		0.085*** (7.72)	0.066*** (5.38)		0.086*** (7.88)		0.045*** (5.80)	0.031*** (3.17)		0.046*** (5.87)
Ortho. $\Delta\log(\text{BER})$ t-1					0.006 (1.25)					0.007 (1.25)
Ortho. $\Delta\log(\text{dollar index})$ t-1				0.067*** (4.96)					0.028*** (2.76)	
No of obs	14303	14303	14303	14303	14303	17931	17931	17931	17931	17931
R-squared	0.023	0.026	0.027	0.026	0.026	0.022	0.022	0.022	0.022	0.022

Orthogonalised $\Delta\log(\text{BER})$ t-1: Residual of $\Delta\log(\text{BER})$ on $\Delta\log(\text{broad dollar index})$ t-1

Orthogonalised $\Delta\log(\text{dollar index})$ t-1: Residual of $\Delta\log(\text{dollar index})$ on $\Delta\log(\text{BER})$ t-1

Controls: the lagged value of $\log(\text{VIX})$, $\Delta\log(\text{US CPI})$, $\Delta\log(\text{US IP})$, $\Delta(\text{US money market rate})$, $\Delta\log(\text{EME CPI})$, $\Delta\log(\text{EME IP})$ and $\Delta(\text{EME money market rate})$

	Dep. variable: 5-y foreign currency spread for 13 EMEs					Dep. variable: 5-y Du-Schreger spread for 14 EMEs				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
$\Delta\log(\text{BER})$ t-1	-0.004* (1.84)		-0.003 (1.18)	-0.005** (2.21)		-0.008*** (3.32)		-0.003 (0.87)	-0.006* (1.75)	
$\Delta\log(\text{dollar index})$ t-1		-0.016*** (5.66)	-0.013*** (4.46)		-0.016*** (5.82)		-0.018*** (4.71)	-0.014** (2.43)		-0.018*** (4.66)
Ortho. $\Delta\log(\text{BER})$ t-1					-0.004 (1.27)					-0.004 (0.76)
Ortho. $\Delta\log(\text{dollar index})$ t-1				-0.014*** (5.04)					-0.013** (2.16)	
R-squared	0.008	0.010	0.011	0.011	0.011	0.085	0.081	0.081	0.081	0.081
Adj. R-squared	0.007	0.010	0.010	0.010	0.010	0.084	0.080	0.080	0.080	0.080

Orthogonalised $\Delta\log(\text{BER})$ t-1: Residual of $\Delta\log(\text{BER})$ on $\Delta\log(\text{broad dollar index})$ t-1

Orthogonalised $\Delta\log(\text{dollar index})$ t-1: Residual of $\Delta\log(\text{dollar index})$ on $\Delta\log(\text{BER})$ t-1

Controls: the lagged value of $\log(\text{VIX})$, $\Delta(\text{US money market rate})$ and $\Delta(\text{EME money market rate})$.

An increase in $\Delta\log(\text{BER})$ means the appreciation of an EME currency against the US dollar.

An increase in $\Delta\log(\text{dollar index})$ means the appreciation of a basket of currencies against the US dollar.



BANK FOR INTERNATIONAL SETTLEMENTS

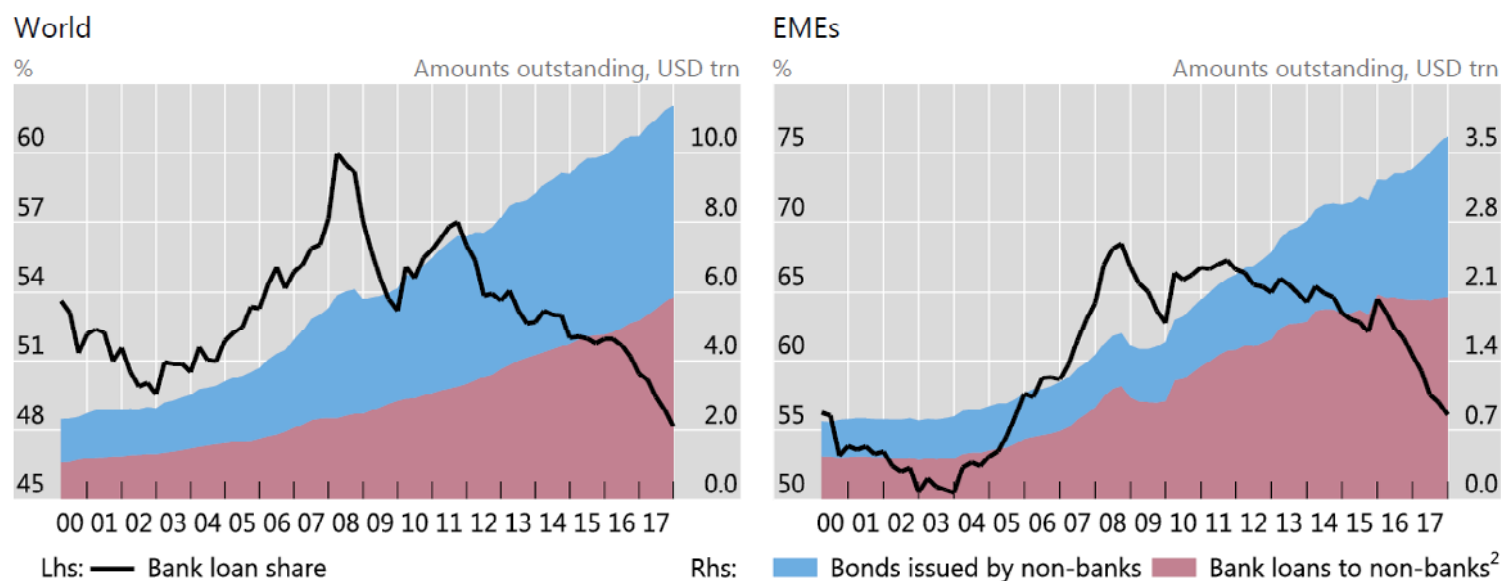
From banks to the bond market



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.

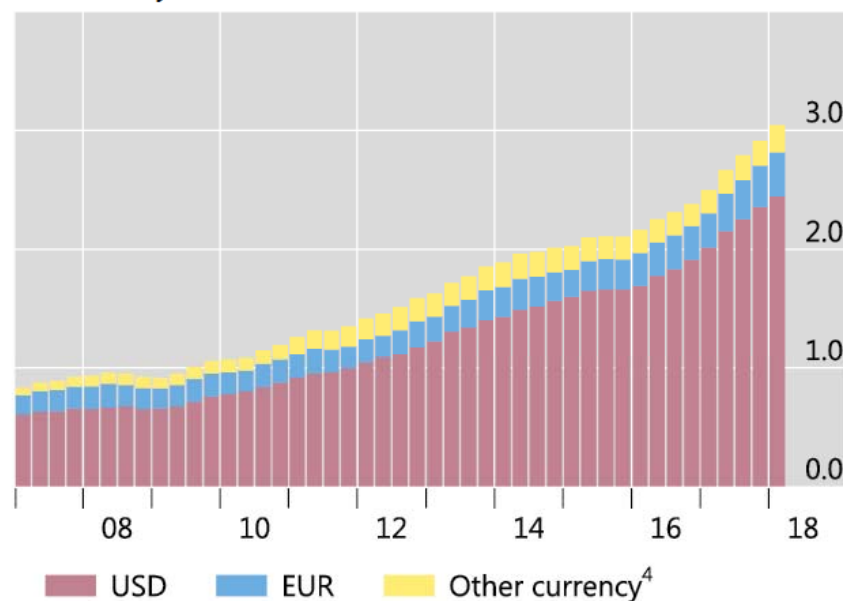
¹ Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. ² Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans.

Source: BIS global liquidity indicators.

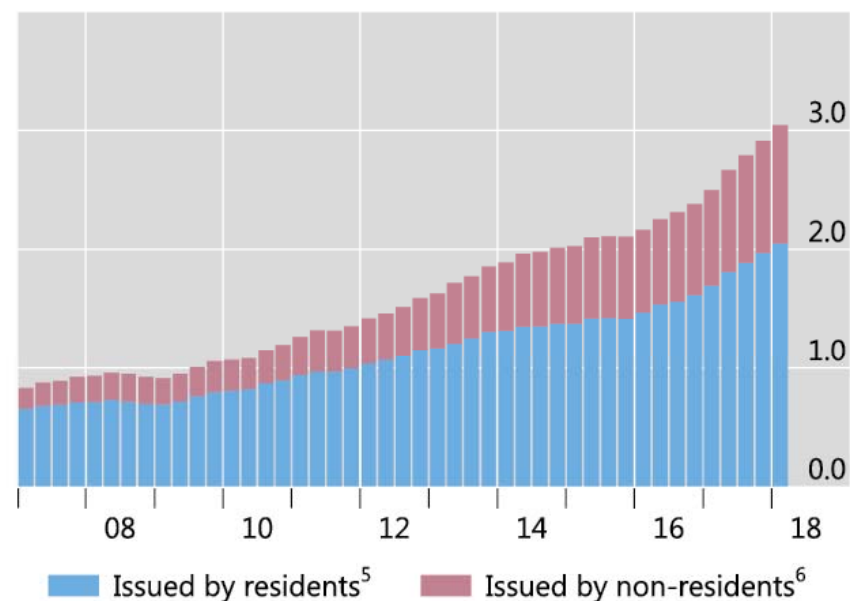
Amounts outstanding of international debt securities¹

Emerging market non-bank corporations², at quarter end, in trillions of US dollars

Nationality basis³



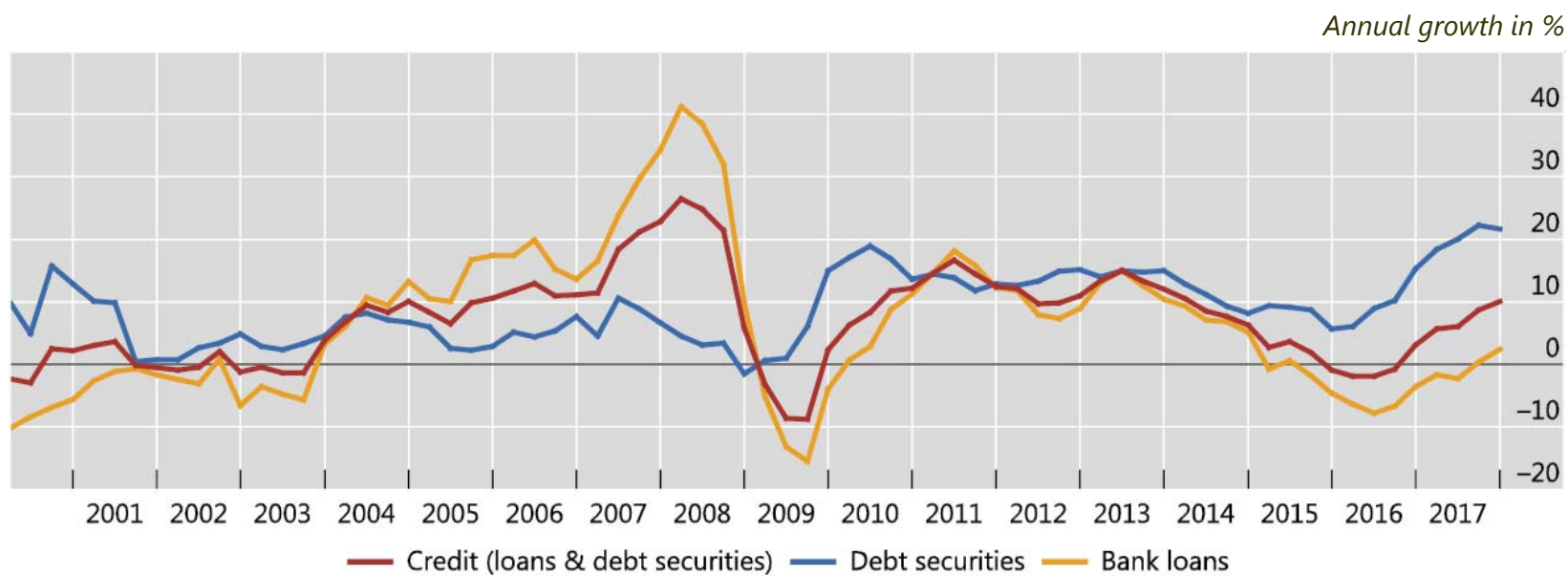
Onshore vs. offshore



¹ International debt securities are issued outside the local market of the country where the borrower resides. ² Non-bank financial institutions, government and non-financial institutions. ³ Nationality basis refers to firms with the headquarters in the EME countries. ⁴ Any other currency except those listed. ⁵ Amounts outstanding of the international debt securities issued by the EME nationals residing in the countries of their headquarters. ⁶ Amounts outstanding of the international debt securities issued by the EME nationals residing outside the countries of their headquarters.

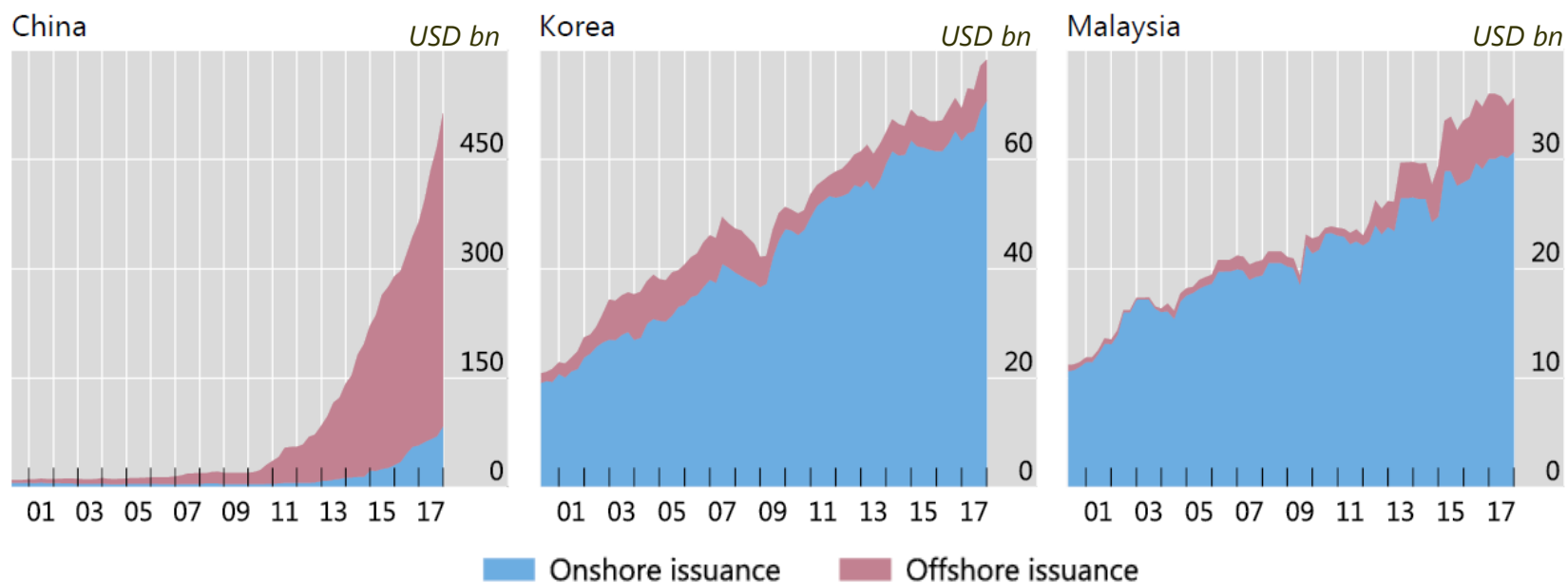
Sources: Dealogic; Euroclear; Thomson Reuters; Trax (Xtrakter Ltd.); BIS calculations.

US dollar-denominated credit to EME non-banks



Source: BIS global liquidity indicators.

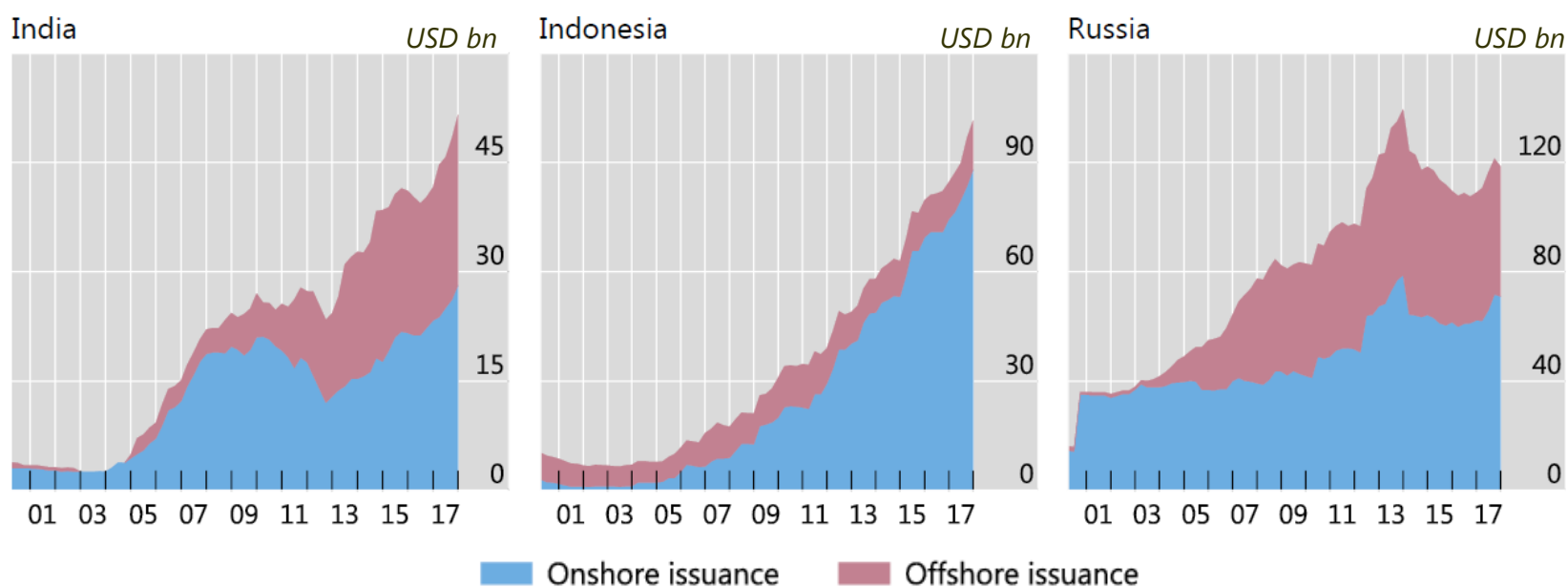
USD-denominated debt securities by EME non-banks



Sources: Dealogic; Euroclear; Thomson Reuters; Trax (Xtrakter Ltd.); BIS calculations.

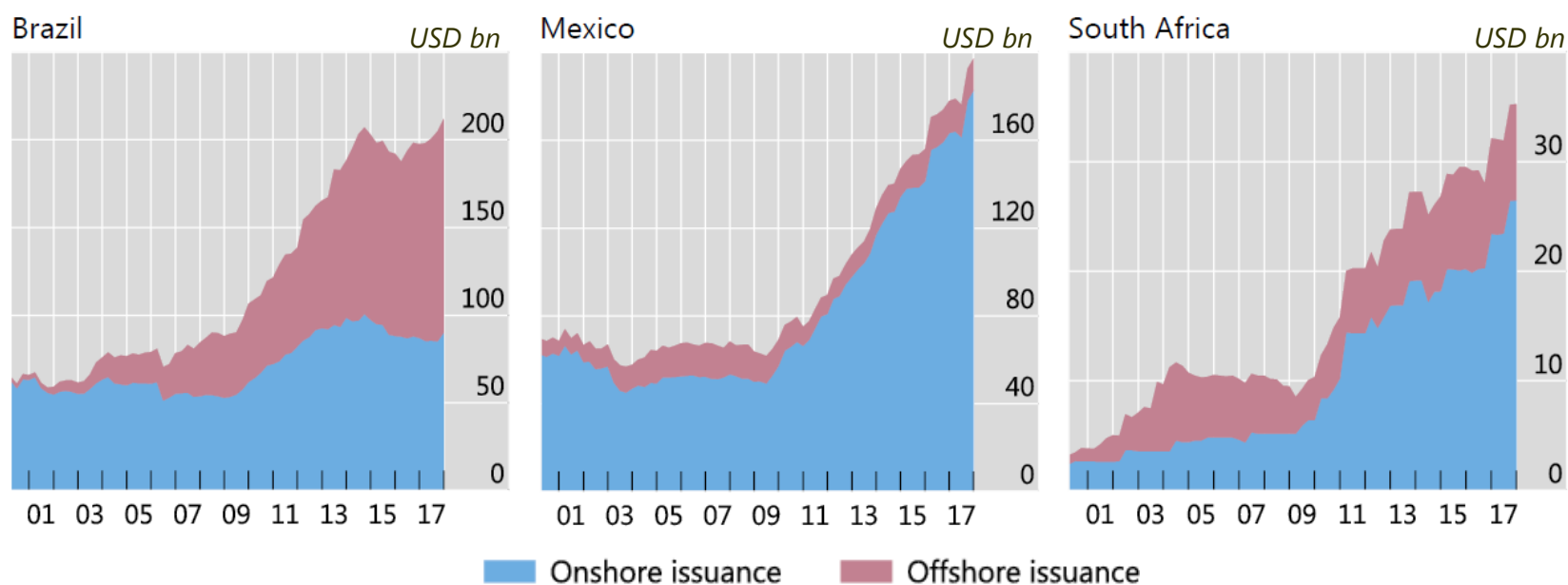


USD-denominated debt securities by EME non-banks



Sources: Dealogic; Euroclear; Thomson Reuters; Trax (Xtrakter Ltd.); BIS calculations.

USD-denominated debt securities by EME non-banks

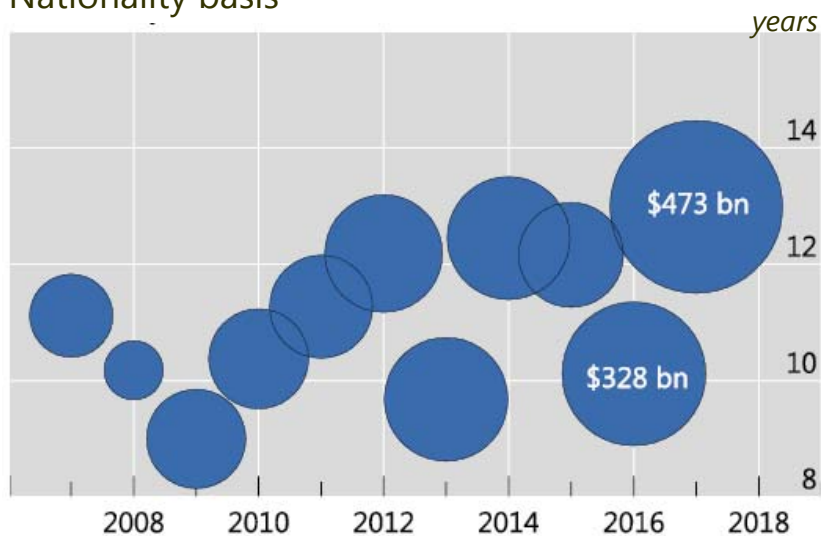


Sources: Dealogic; Euroclear; Thomson Reuters; Trax (Xtrakter Ltd.); BIS calculations.

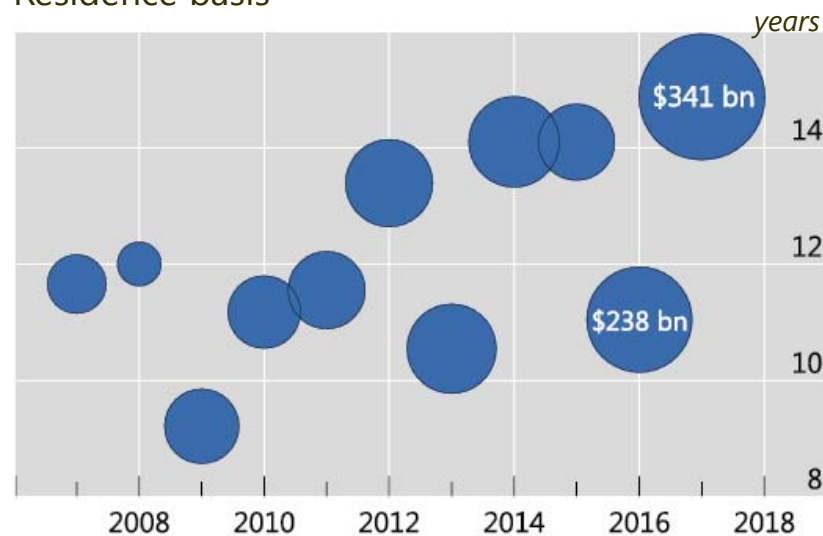
Annual gross issuance and maturity of USD IDS

EME non-bank corporations

Nationality basis



Residence basis



Sources: Dealogic; Euroclear; Thomson Reuters; Trax (Xtrakter Ltd.); BIS calculations.

Mitigating factors

- Bonds issued by emerging market corporates have long maturities
- EMEs hold substantial foreign exchange reserves
- EME corporate issuers are often global firms with cash flow in foreign currency

Qualifications

- Withdrawal of corporate deposits and MMF holdings have repercussions on domestic banks (Bruno and Shin (RFS 2017))
- Longer maturity is double-edged; longer duration means higher market risk. Portfolio managers with limited appetite for losses more likely to cut and run
- Central banks cannot easily provide liquidity to non-banks
 - Corporate sector may cut investment and curtail operations
 - Sectoral distribution of FX holdings matter

Even central bank with large foreign exchange reserves may find it difficult to head off a slowing real economy when global financial conditions tighten