

# Annexes

## BIS Statistics: Charts

The statistics published by the BIS are a unique source of information about the structure of and activity in the global financial system. BIS statistics are presented in graphical form in this annex and in tabular form in the *BIS Statistical Bulletin*, which is published concurrently with the *BIS Quarterly Review*. For introductions to the BIS statistics and a glossary of terms used in this annex, see the *BIS Statistical Bulletin*.

The data shown in the charts in this annex can be downloaded from the *BIS Quarterly Review* page on the BIS website ([www.bis.org/publ/quarterly.htm](http://www.bis.org/publ/quarterly.htm)). Data may have been revised or updated subsequent to the publication of this annex. For the latest data and to download additional data, see the statistics pages on the BIS website ([www.bis.org/statistics/index.htm](http://www.bis.org/statistics/index.htm)). A release calendar provides advance notice of publication dates ([www.bis.org/statistics/relcal.htm](http://www.bis.org/statistics/relcal.htm)).

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## A Locational banking statistics

Cross-border claims, by sector, currency and instrument

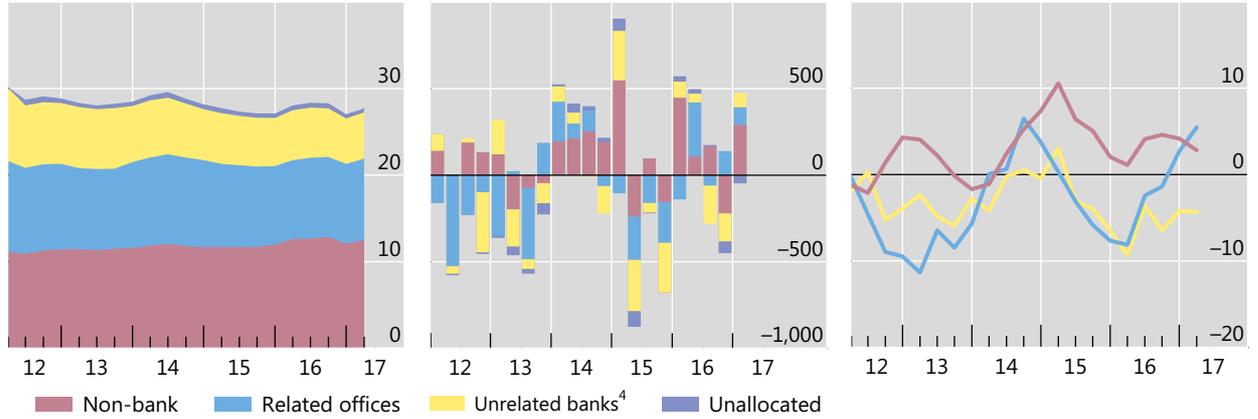
Graph A.1

Amounts outstanding, in USD trn<sup>1</sup>

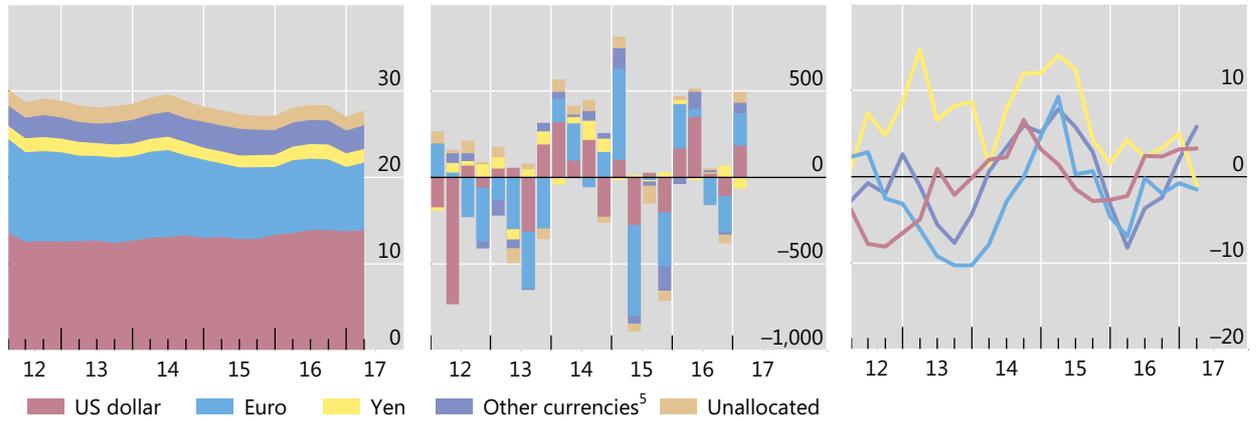
Adjusted changes, in USD bn<sup>2</sup>

Annual change, in per cent<sup>3</sup>

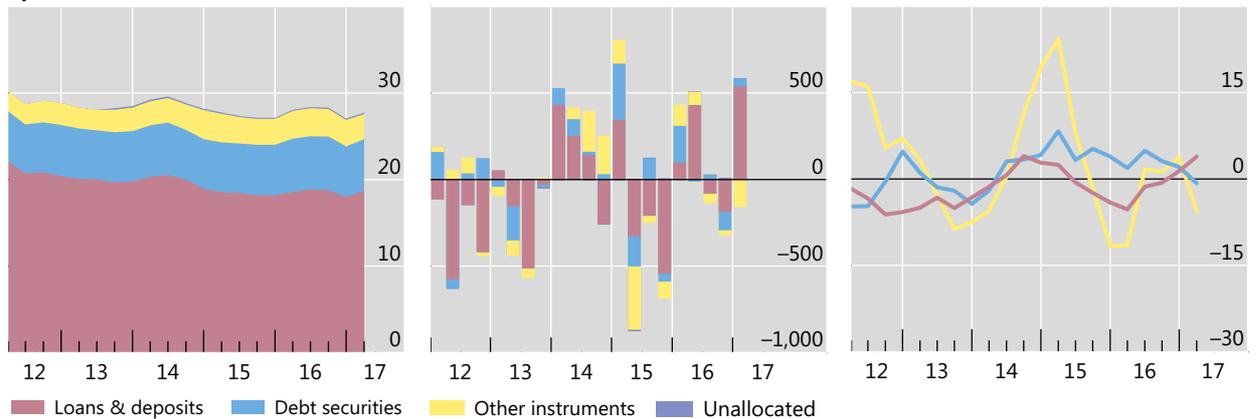
By sector of counterparty



By currency



By instrument



Further information on the BIS locational banking statistics is available at [www.bis.org/statistics/bankstats.htm](http://www.bis.org/statistics/bankstats.htm).

<sup>1</sup> At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. <sup>3</sup> Geometric mean of quarterly percentage adjusted changes. <sup>4</sup> Includes central banks and banks unallocated by subsector between intragroup and unrelated banks. <sup>5</sup> Other reported currencies, calculated as all currencies minus US dollar, euro, yen and unallocated currencies. The currency is known but reporting is incomplete.

Source: BIS locational banking statistics.

## Cross-border claims, by borrowing region

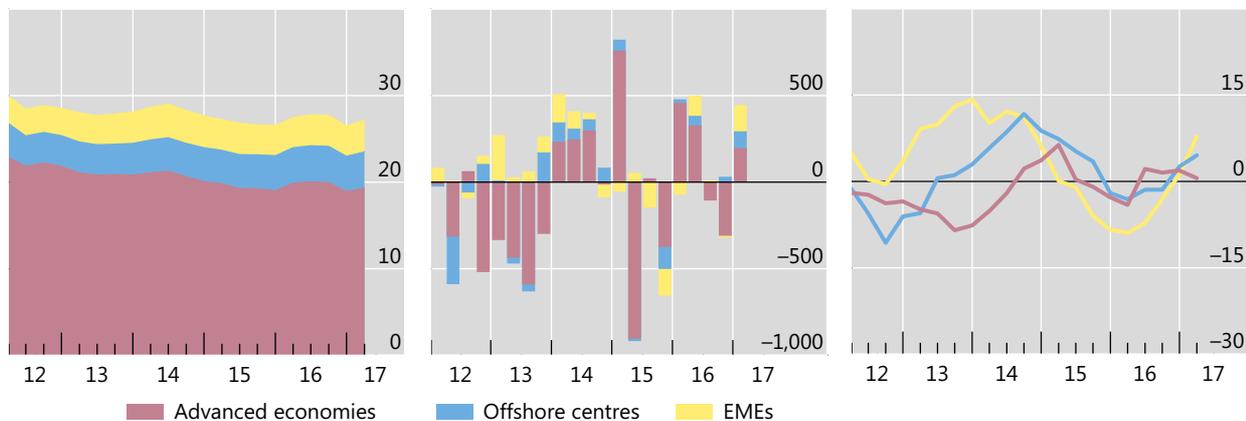
Graph A.2

Amounts outstanding, in USD trn<sup>1</sup>

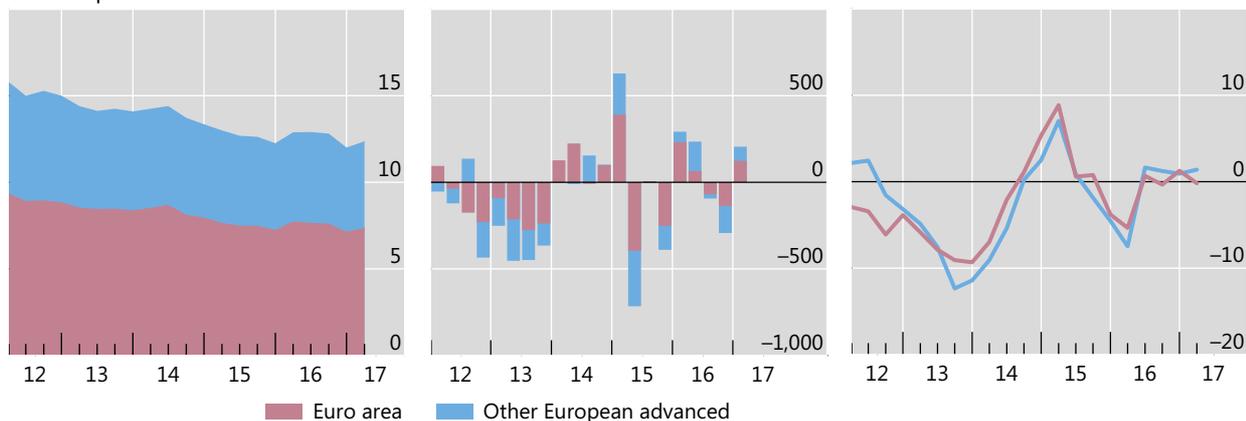
Adjusted changes, in USD bn<sup>2</sup>

Annual change, in per cent<sup>3</sup>

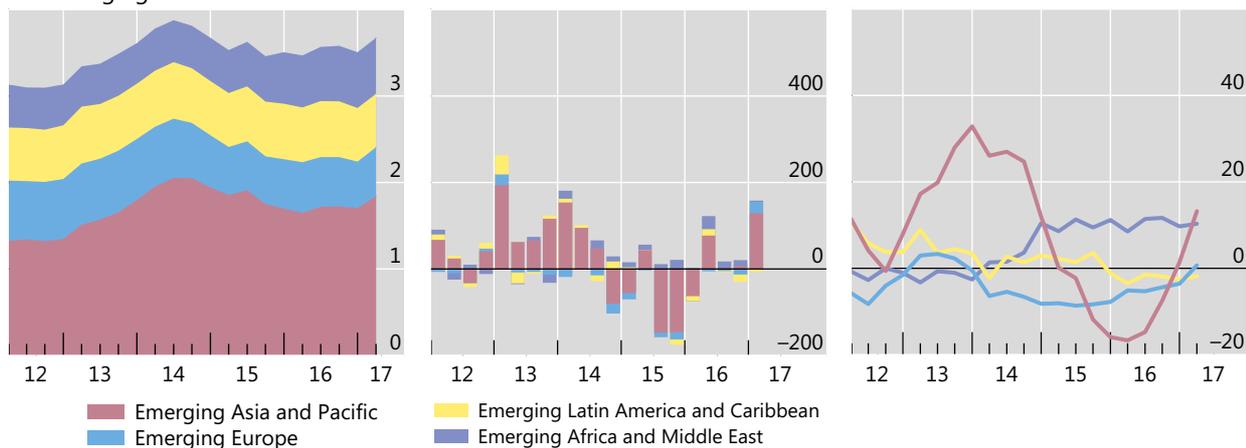
On all countries



On Europe



On emerging market economies



Further information on the BIS locational banking statistics is available at [www.bis.org/statistics/bankstats.htm](http://www.bis.org/statistics/bankstats.htm).

<sup>1</sup> At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. <sup>3</sup> Geometric mean of quarterly percentage adjusted changes.

Source: BIS locational banking statistics.

# Cross-border claims, by borrowing country

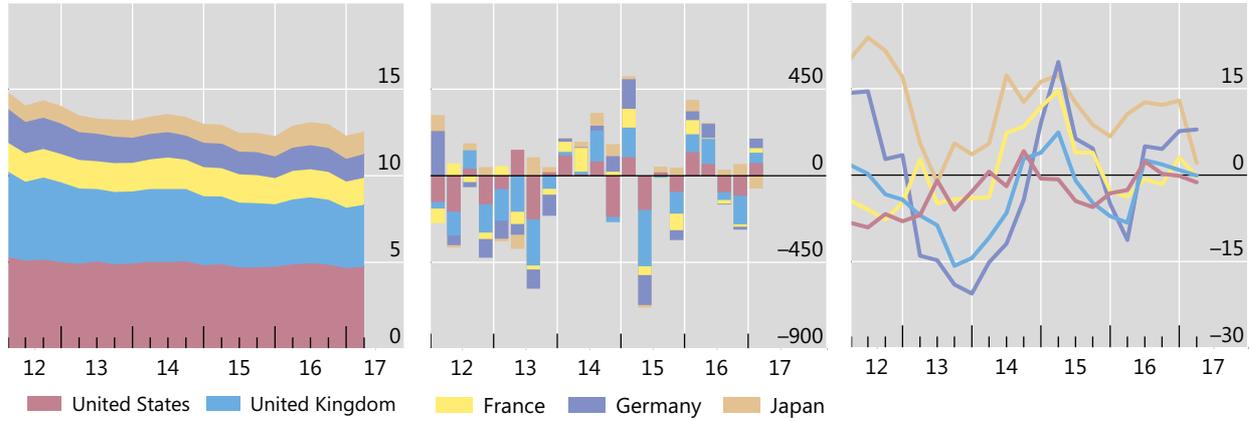
Graph A.3

Amounts outstanding, in USD trn<sup>1</sup>

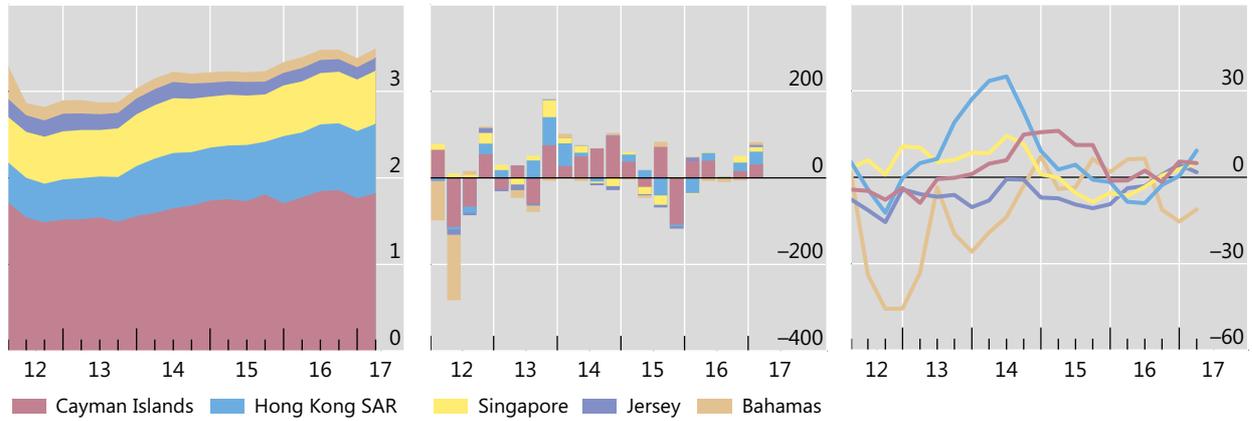
Adjusted changes, in USD bn<sup>2</sup>

Annual change, in per cent<sup>3</sup>

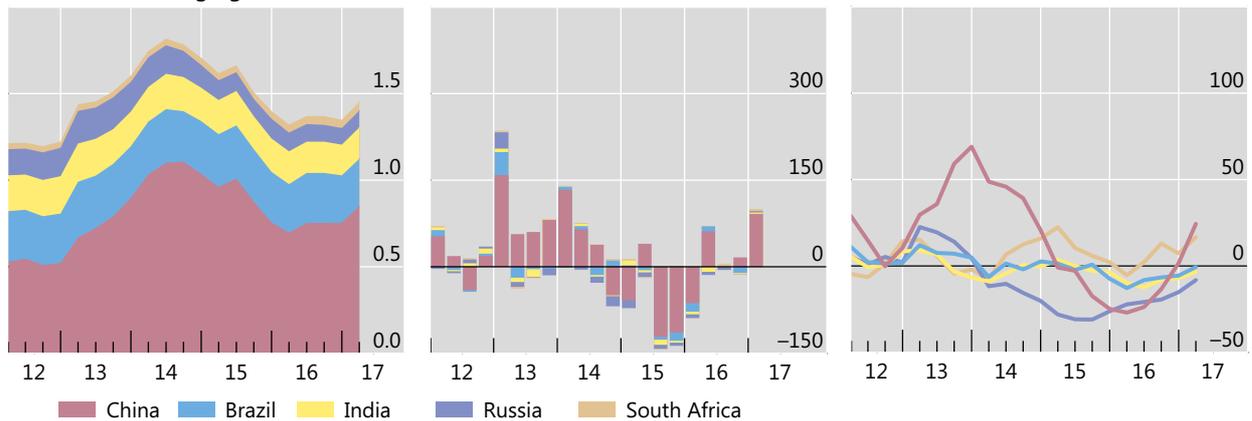
On selected advanced economies



On selected offshore centres



On selected emerging market economies

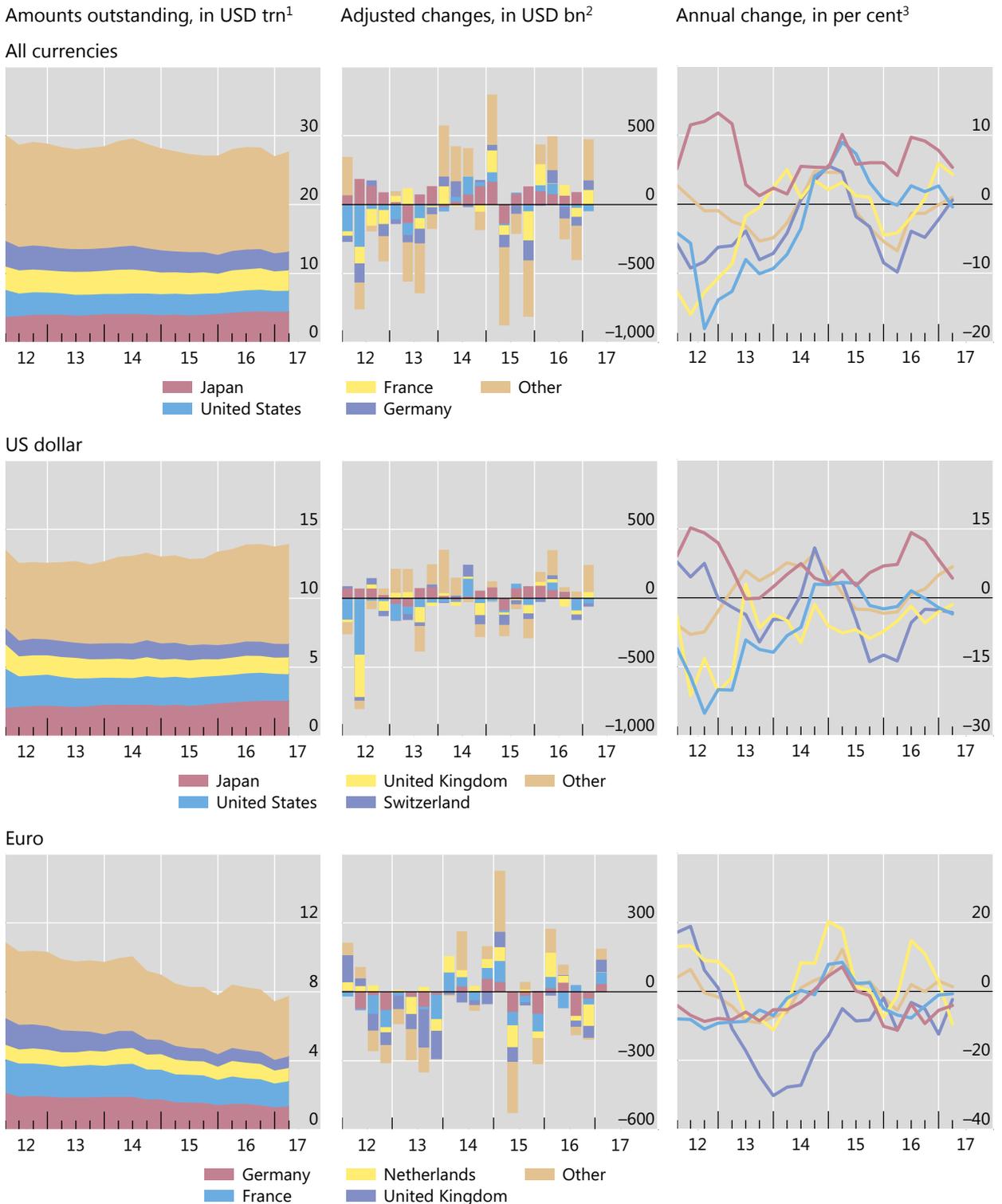


Further information on the BIS locational banking statistics is available at [www.bis.org/statistics/bankstats.htm](http://www.bis.org/statistics/bankstats.htm).

<sup>1</sup> At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. <sup>3</sup> Geometric mean of quarterly percentage adjusted changes.

Source: BIS locational banking statistics.

Cross-border claims, by nationality of reporting bank and currency of denomination Graph A.4



Further information on the BIS locational banking statistics is available at [www.bis.org/statistics/bankstats.htm](http://www.bis.org/statistics/bankstats.htm).

<sup>1</sup> At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. <sup>3</sup> Geometric mean of quarterly percentage adjusted changes.

Source: BIS locational banking statistics.

# Cross-border liabilities of reporting banks

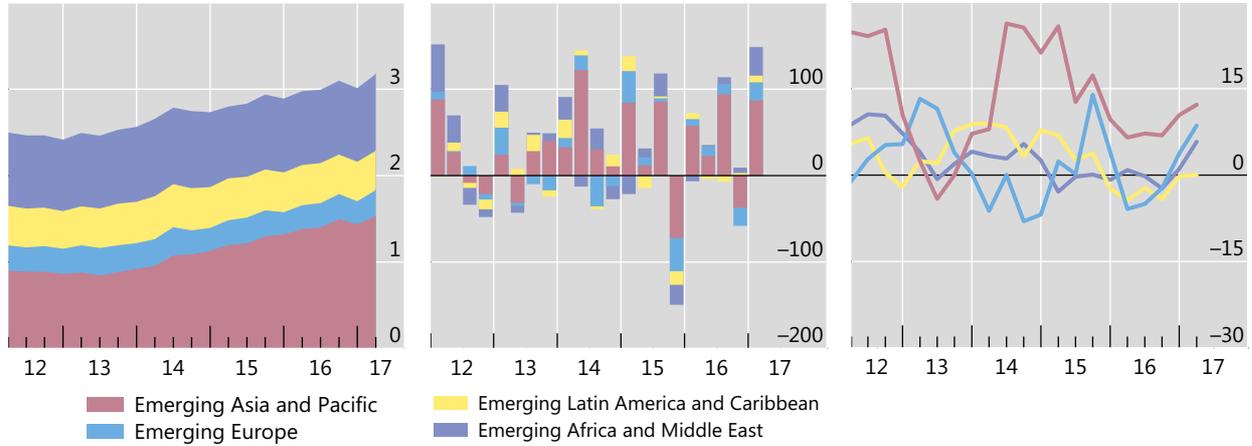
Graph A.5

Amounts outstanding, in USD trn<sup>1</sup>

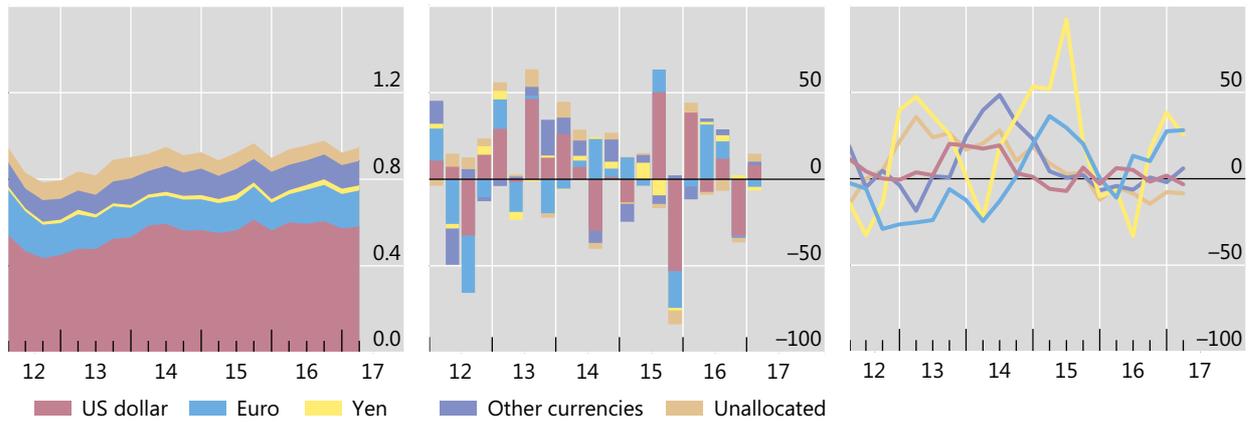
Adjusted changes, in USD bn<sup>2</sup>

Annual change, in per cent<sup>3</sup>

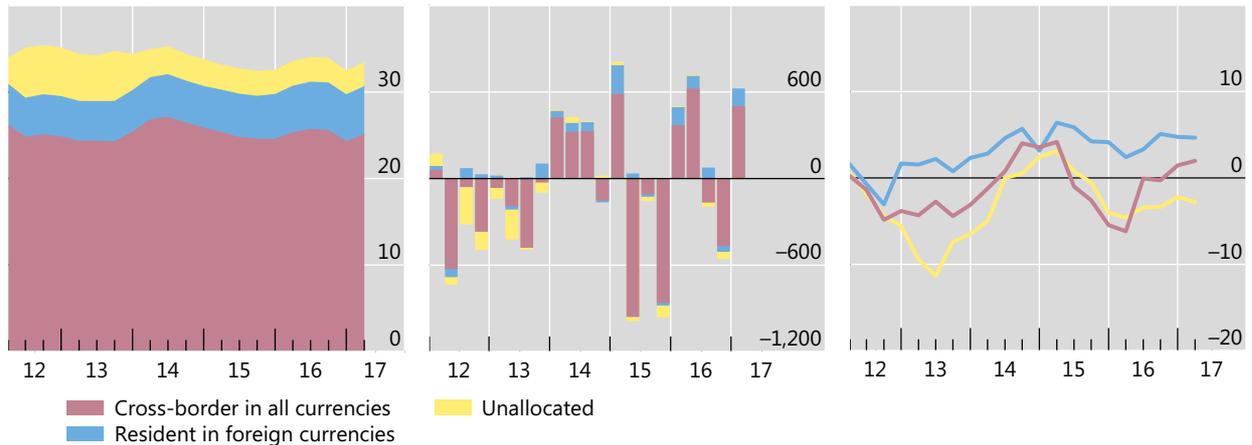
To emerging market economies



To central banks



By currency type and location



Further information on the BIS locational banking statistics is available at [www.bis.org/statistics/bankstats.htm](http://www.bis.org/statistics/bankstats.htm).

<sup>1</sup> At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. <sup>3</sup> Geometric mean of quarterly percentage adjusted changes.

Source: BIS locational banking statistics.

## B Consolidated banking statistics

Consolidated claims of reporting banks on advanced economies

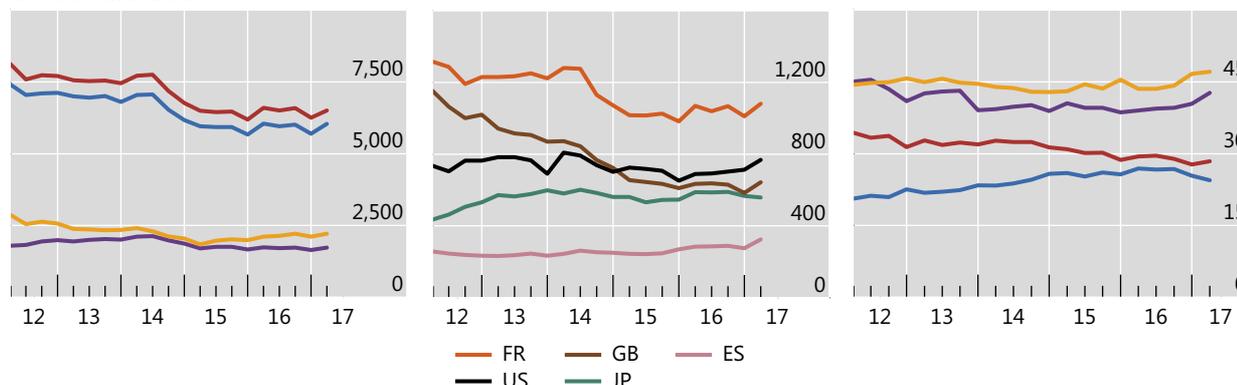
Graph B.1

Foreign claims and local positions, in USD bn<sup>1,2</sup>

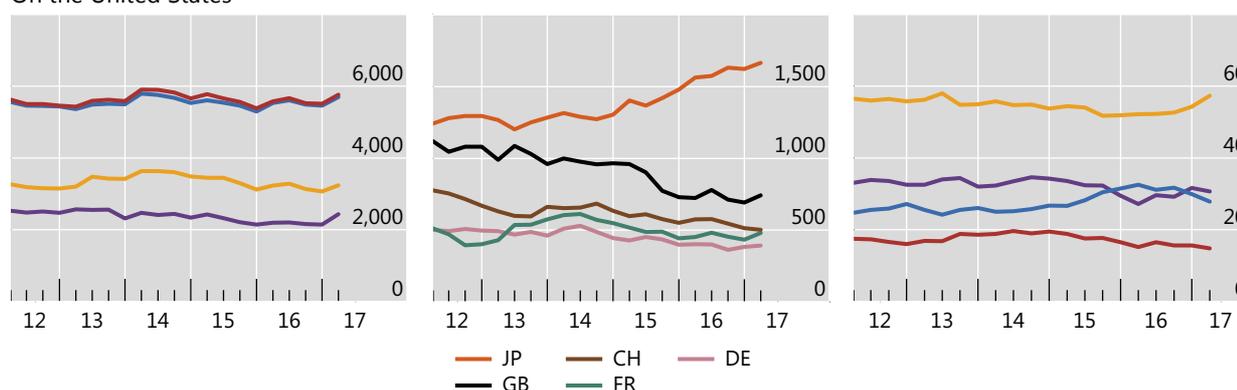
Foreign claims of selected creditors, in USD bn<sup>1,3</sup>

International claims, by sector and maturity, in per cent<sup>4</sup>

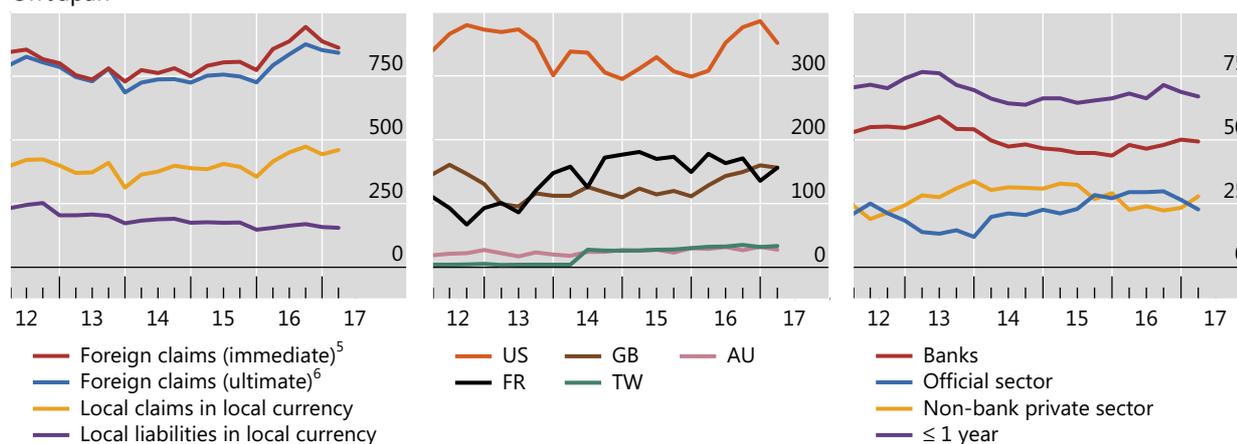
On the euro area



On the United States



On Japan



AU = Australia; CH = Switzerland; DE = Germany; FR = France; GB = United Kingdom; JP = Japan; NL = Netherlands; US = United States.

Further information on the BIS consolidated banking statistics is available at [www.bis.org/statistics/bankstats.htm](http://www.bis.org/statistics/bankstats.htm).

<sup>1</sup> Amounts outstanding at quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Excludes domestic claims, ie claims on residents of a bank's home country. <sup>3</sup> Foreign claims on an ultimate risk basis, by nationality of reporting bank. The banking systems shown are not necessarily the largest foreign bank creditors on each reference date. <sup>4</sup> As a percentage of international claims outstanding. <sup>5</sup> On an immediate counterparty basis. Includes the unconsolidated claims of banks headquartered outside but located inside CBS-reporting countries. <sup>6</sup> On an ultimate risk basis.

Source: BIS consolidated banking statistics (CBS).

Consolidated claims of reporting banks on emerging market economies

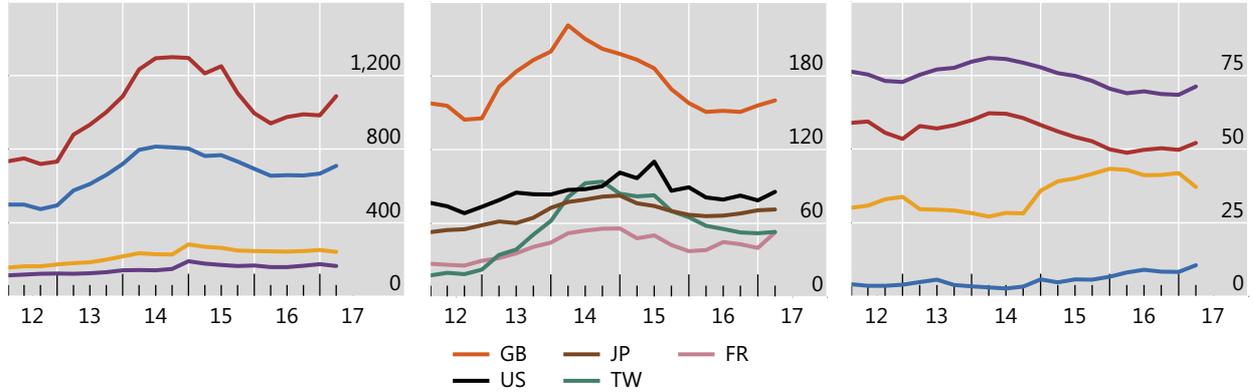
Graph B.2

Foreign claims and local positions, in USD bn<sup>1,2</sup>

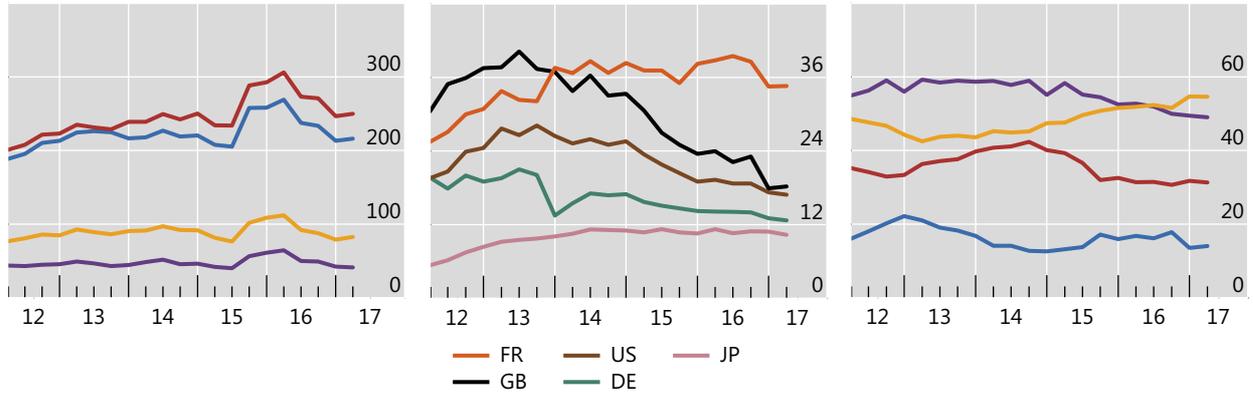
Foreign claims of selected creditors, in USD bn<sup>1,3</sup>

International claims, by sector and maturity, in per cent<sup>4</sup>

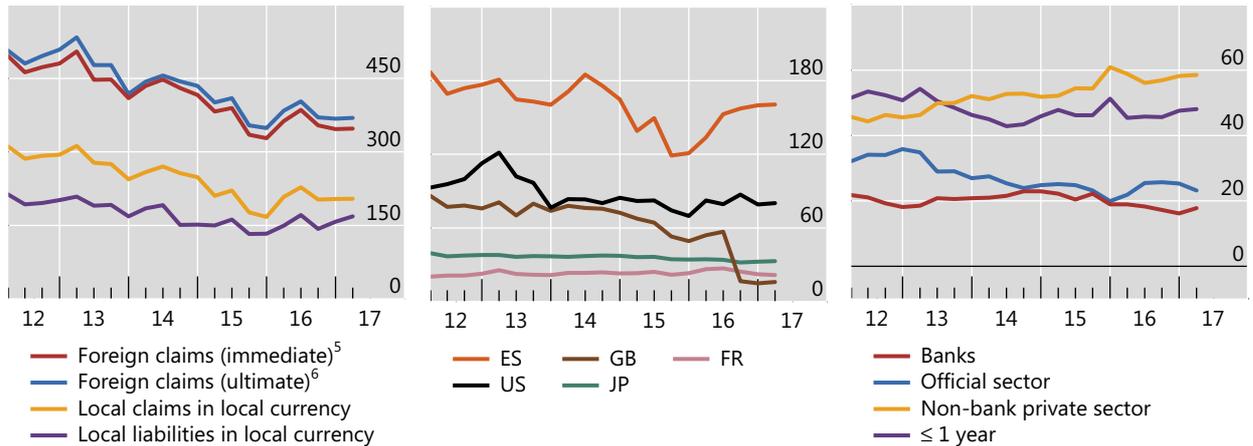
On China



On Turkey



On Brazil



AU = Australia; DE = Germany; ES = Spain; GB = United Kingdom; GR = Greece; JP = Japan; NL = Netherlands; TW = Chinese Taipei; US = United States.

Further information on the BIS consolidated banking statistics is available at [www.bis.org/statistics/bankstats.htm](http://www.bis.org/statistics/bankstats.htm).

<sup>1</sup> Amounts outstanding at quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Excludes domestic claims, ie claims on residents of a bank's home country. <sup>3</sup> Foreign claims on an ultimate risk basis, by nationality of reporting bank. The banking systems shown are not necessarily the largest foreign bank creditors on each reference date. <sup>4</sup> As a percentage of international claims. <sup>5</sup> On an immediate counterparty basis. Includes the unconsolidated claims of banks headquartered outside but located inside CBS-reporting countries. <sup>6</sup> On an ultimate risk basis.

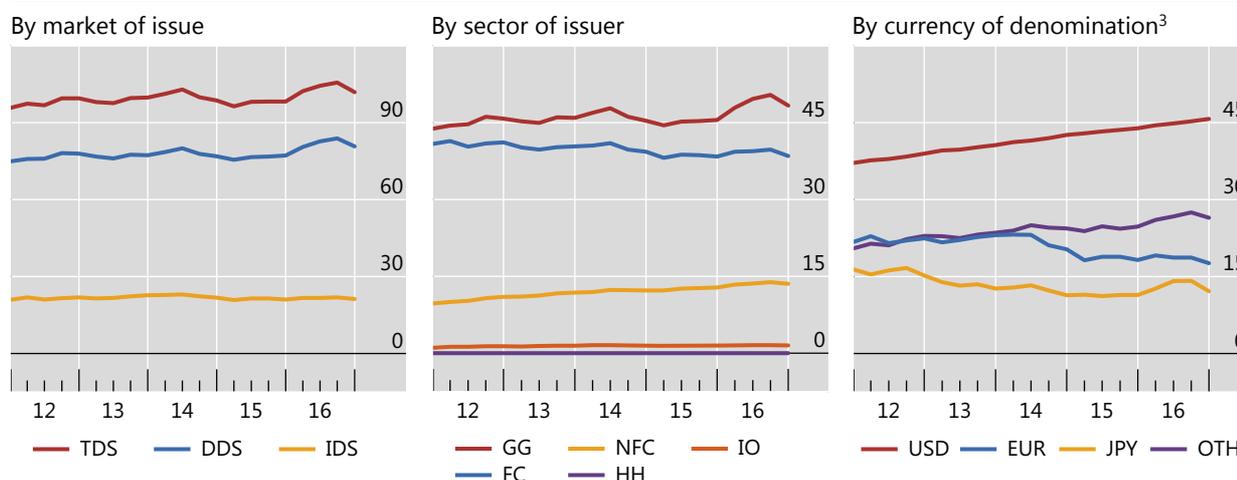
Source: BIS consolidated banking statistics (CBS).

## C Debt securities statistics

### Global debt securities markets<sup>1</sup>

Amounts outstanding, in trillions of US dollars<sup>2</sup>

Graph C.1



DDS = domestic debt securities; IDS = international debt securities; TDS = total debt securities.

FC = financial corporations; GG = general government; HH = households and non-profit institutions serving households; IO = international organisations; NFC = non-financial corporations.

EUR = euro; JPY = yen; OTH = other currencies; USD = US dollar.

Further information on the BIS debt securities statistics is available at [www.bis.org/statistics/secstats.htm](http://www.bis.org/statistics/secstats.htm).

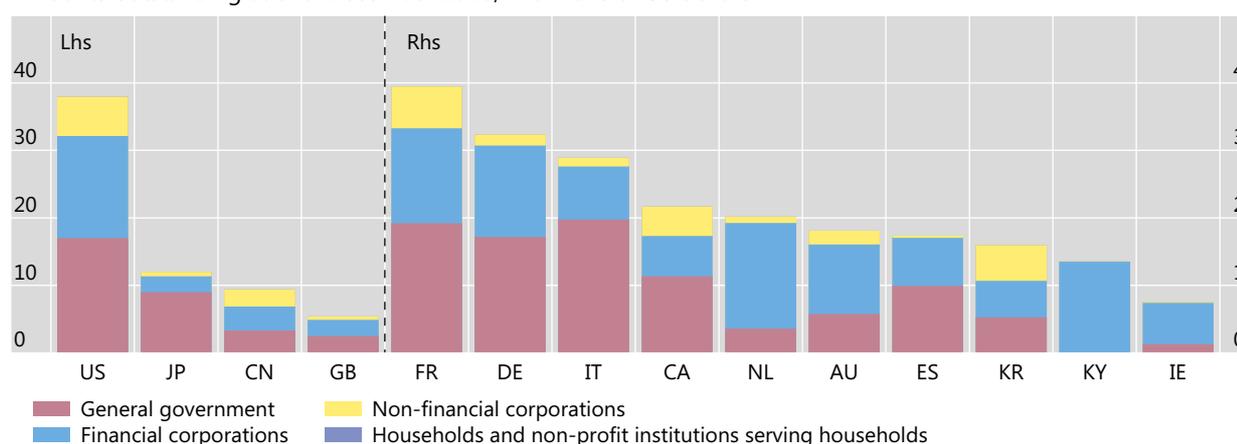
<sup>1</sup> Sample of countries varies across breakdowns shown. For countries that do not report TDS, data are estimated by the BIS as DDS plus IDS. For countries that do not report either TDS or DDS, data are estimated by the BIS as IDS. <sup>2</sup> At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>3</sup> Where a currency breakdown is not available, DDS are assumed to be denominated in the local currency.

Sources: IMF; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; national data; BIS debt securities statistics; BIS calculations.

### Total debt securities, by residence and sector of issuer<sup>1</sup>

Amounts outstanding at end-December 2016, in trillions of US dollars<sup>2</sup>

Graph C.2



AU = Australia; CA = Canada; CN = China; DE = Germany; ES = Spain; FR = France; GB = United Kingdom; IE = Ireland; IT = Italy; JP = Japan; KR = Korea; KY = Cayman Islands; NL = Netherlands; US = United States.

Further information on the BIS debt securities statistics is available at [www.bis.org/statistics/secstats.htm](http://www.bis.org/statistics/secstats.htm).

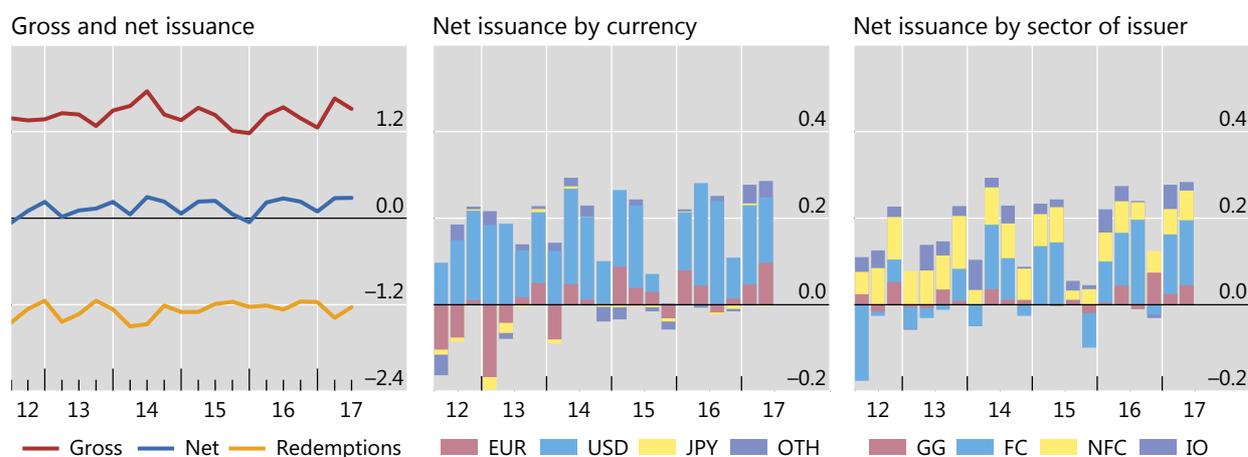
<sup>1</sup> For countries that do not report TDS, data are estimated by the BIS as DDS plus IDS. <sup>2</sup> Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Sources: National data; BIS debt securities statistics.

## International debt securities, by currency and sector

In trillions of US dollars

Graph C.3



EUR = euro; JPY = yen; OTH = other currencies; USD = US dollar.

FC= financial corporations; GG = general government; IO = international organisations; NFC = non-financial corporations.

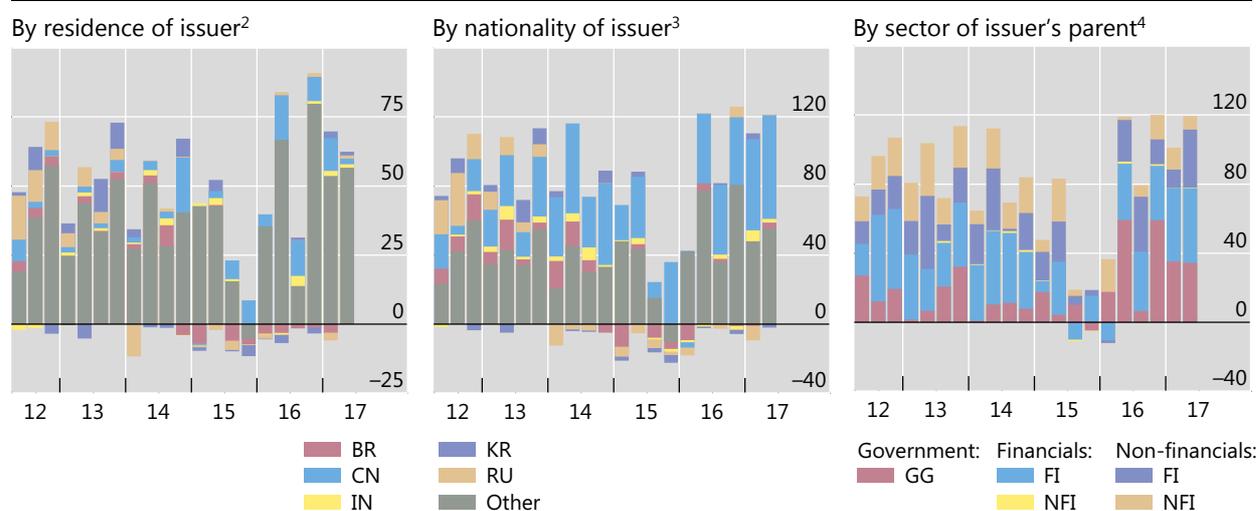
Further information on the BIS debt securities statistics is available at [www.bis.org/statistics/secstats.htm](http://www.bis.org/statistics/secstats.htm).

Sources: IMF; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS debt securities statistics.

## International debt securities issued by borrowers from emerging market economies<sup>1</sup>

Net issuance, in billions of US dollars

Graph C.4



BR = Brazil; CN = China; IN = India; KR = Korea; RU = Russia.

FI = financial corporations; GG = general government; NFI = non-financial corporations.

Further information on the BIS debt securities statistics is available at [www.bis.org/statistics/secstats.htm](http://www.bis.org/statistics/secstats.htm).

<sup>1</sup> For the sample of countries comprising emerging market economies, see the glossary to the *BIS Statistical Bulletin*. <sup>2</sup> Country where issuer resides. <sup>3</sup> Country where issuer's controlling parent is located. Includes issuance by financing vehicles incorporated in offshore financial centres with parents based in an emerging market economy. <sup>4</sup> By nationality, ie issuers with parents based in an emerging market economy. Issuers are grouped by sector of their parent.

Sources: IMF; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS debt securities statistics.

## D Derivatives statistics

### Exchange-traded derivatives

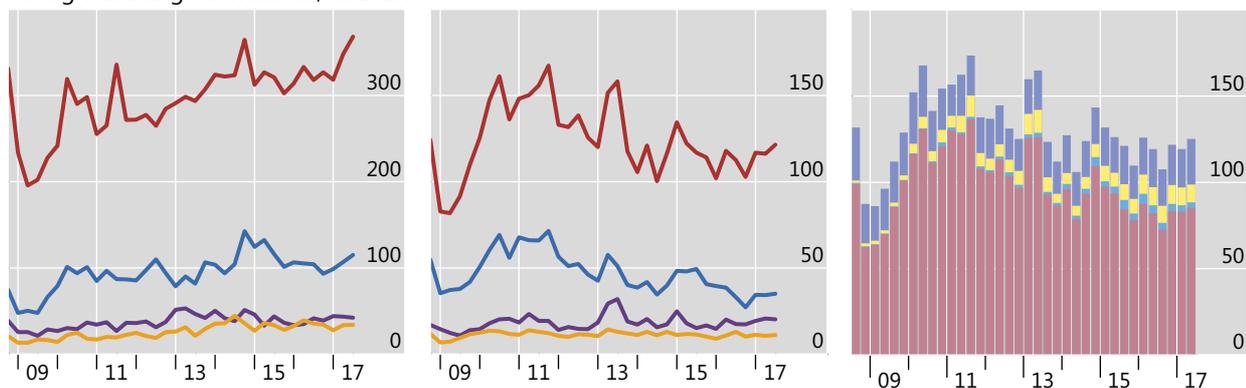
Graph D.1

Open interest, by currency<sup>1</sup>

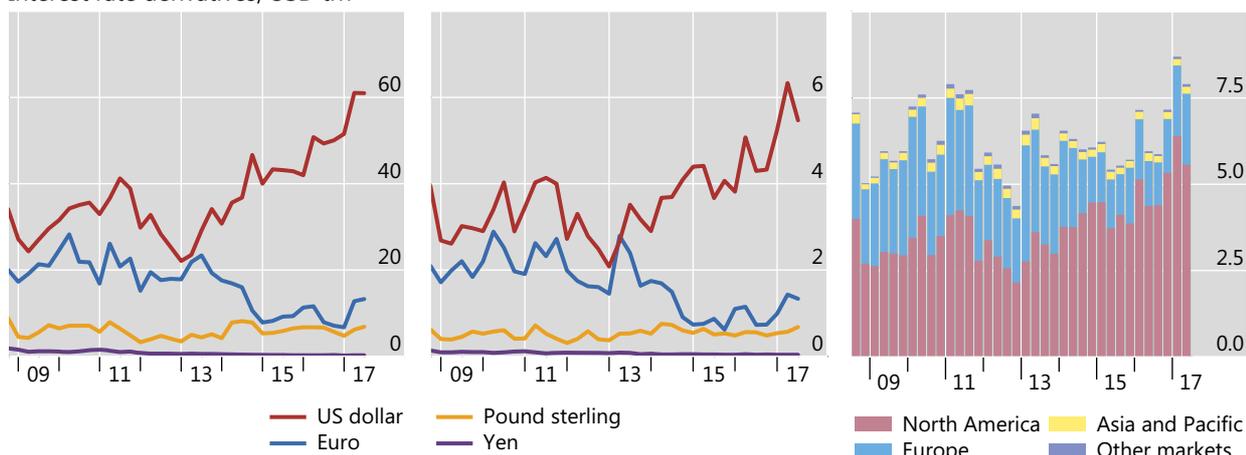
Daily average turnover, by currency<sup>2</sup>

Daily average turnover, by location of exchange<sup>2</sup>

Foreign exchange derivatives, USD bn<sup>3</sup>



Interest rate derivatives, USD trn<sup>3</sup>



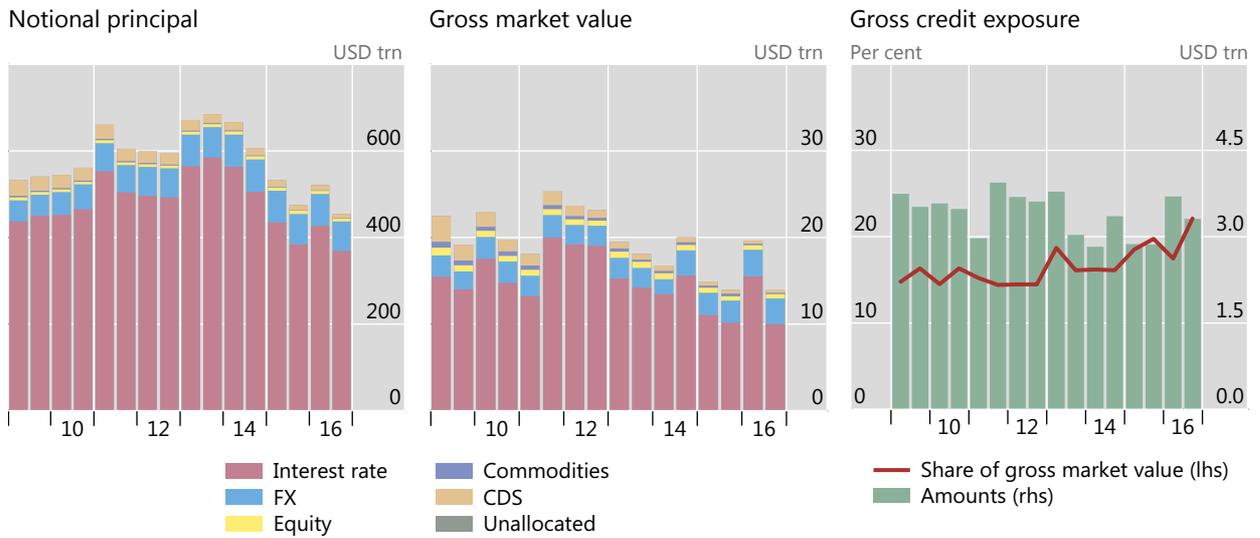
Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/extderiv.htm](http://www.bis.org/statistics/extderiv.htm).

<sup>1</sup> At quarter-end. Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date. <sup>2</sup> Quarterly averages of daily turnover. <sup>3</sup> Futures and options.

Sources: Euromoney TRADEDATA; Futures Industry Association; The Options Clearing Corporation; BIS derivatives statistics.

# Global OTC derivatives markets<sup>1</sup>

Graph D.2



Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

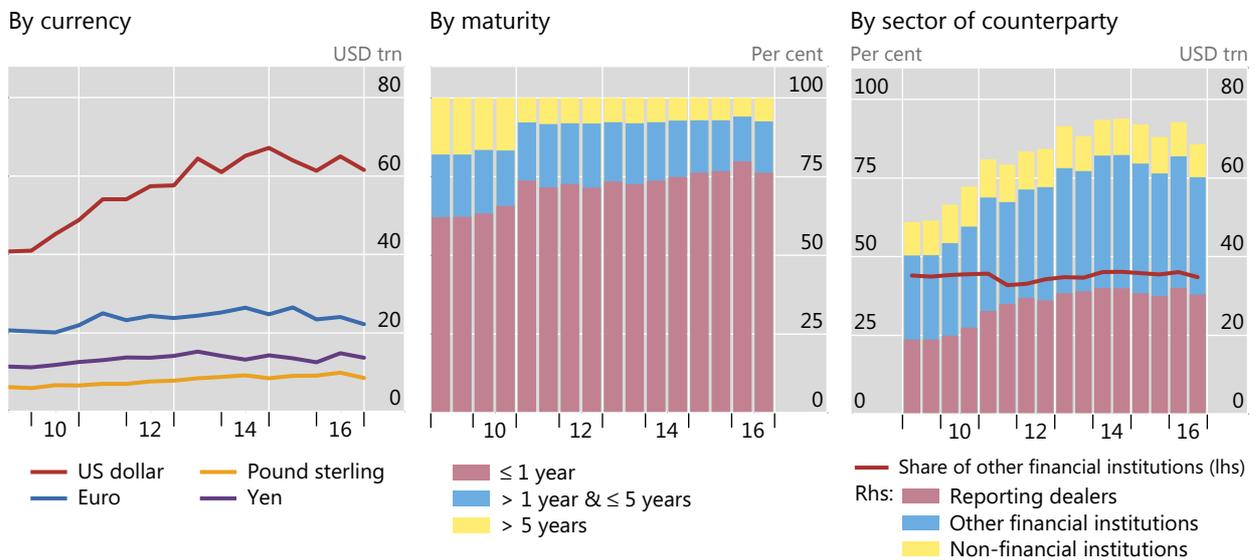
<sup>1</sup> At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

# OTC foreign exchange derivatives

Notional principal<sup>1</sup>

Graph D.3



Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

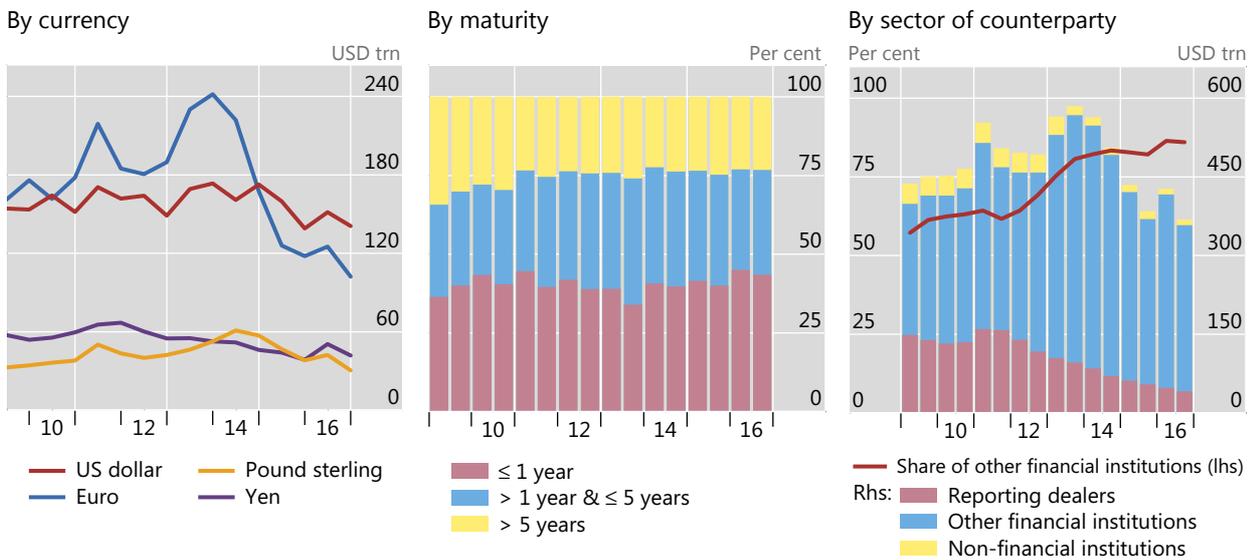
<sup>1</sup> At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

## OTC interest rate derivatives

Notional principal<sup>1</sup>

Graph D.4



Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

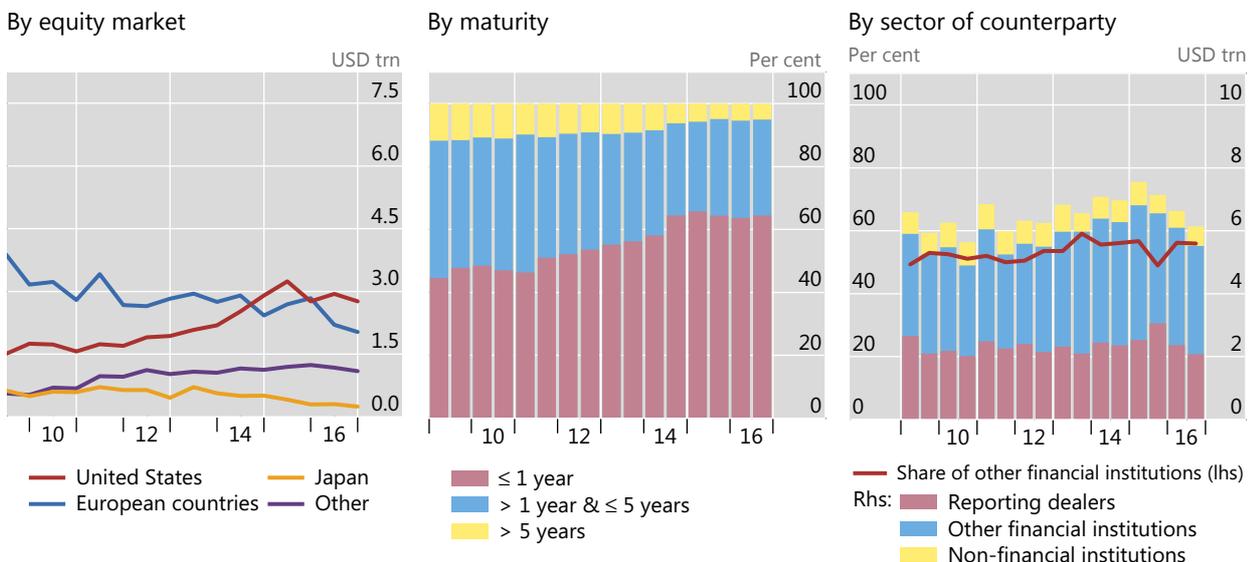
<sup>1</sup> At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

## OTC equity-linked derivatives

Notional principal<sup>1</sup>

Graph D.5



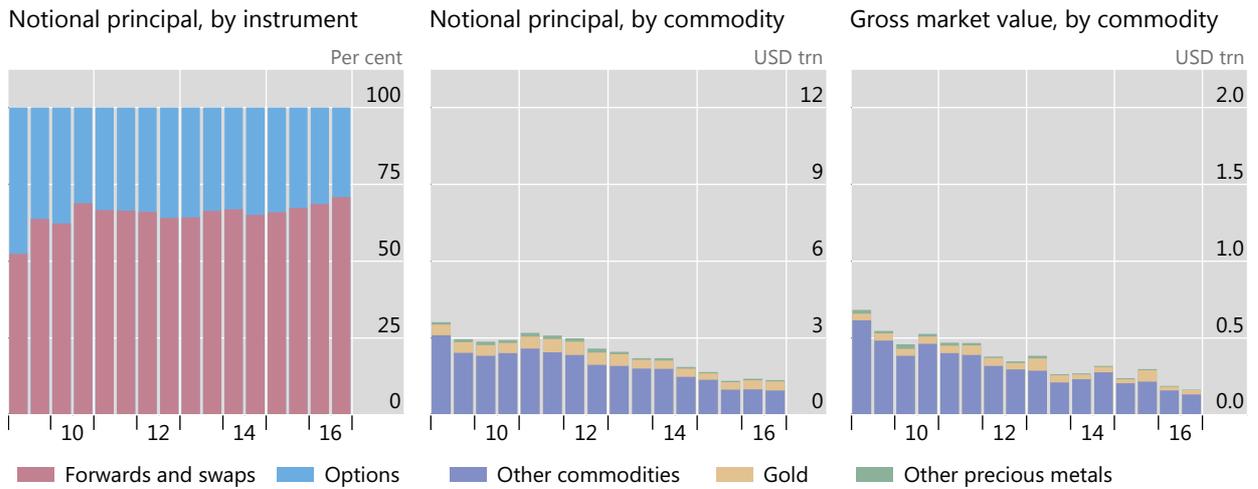
Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

<sup>1</sup> At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

# OTC commodity derivatives<sup>1</sup>

Graph D.6



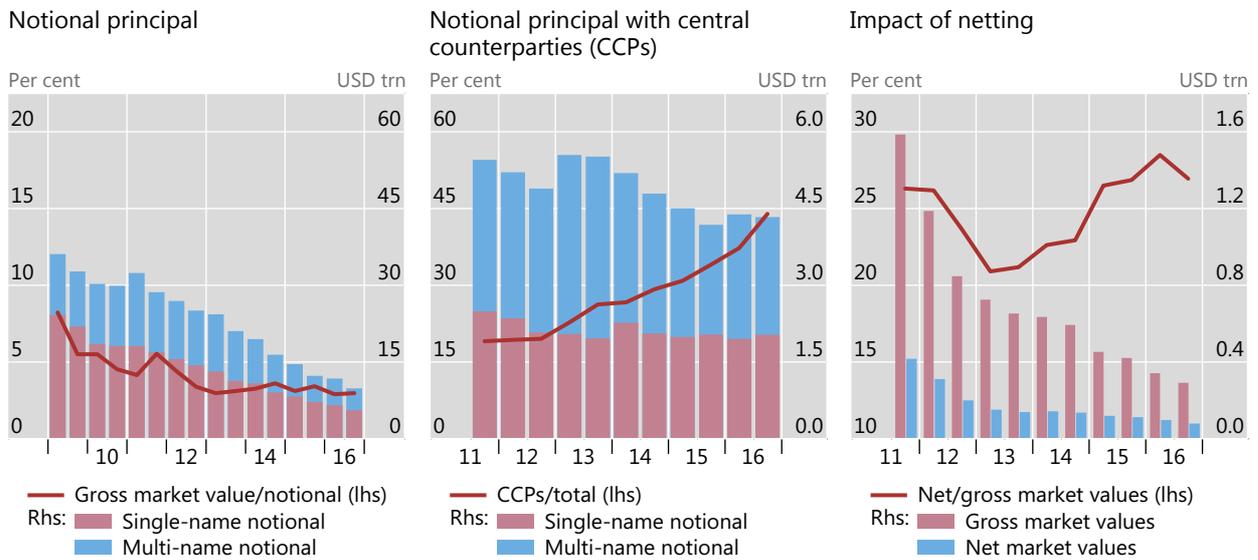
Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

<sup>1</sup> At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

# Credit default swaps<sup>1</sup>

Graph D.7



Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

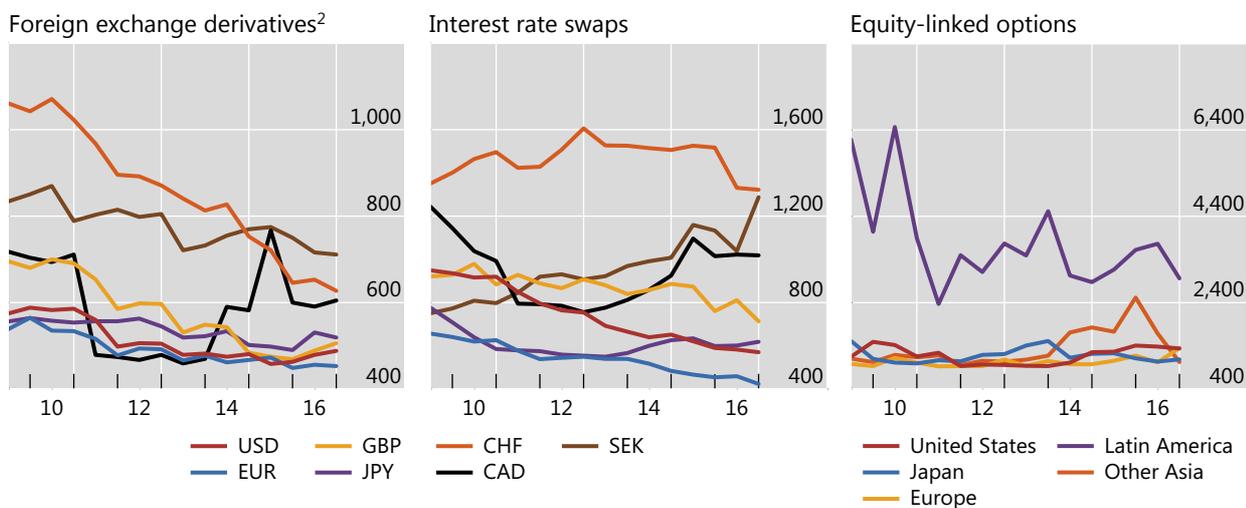
<sup>1</sup> At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

## Concentration in global OTC derivatives markets

Herfindahl index<sup>1</sup>

Graph D.8



CAD = Canadian dollar; CHF = Swiss franc; EUR = euro; GBP = pound sterling; JPY = yen; SEK = Swedish krona; USD = US dollar.

Further information on the BIS derivatives statistics is available at [www.bis.org/statistics/derstats.htm](http://www.bis.org/statistics/derstats.htm).

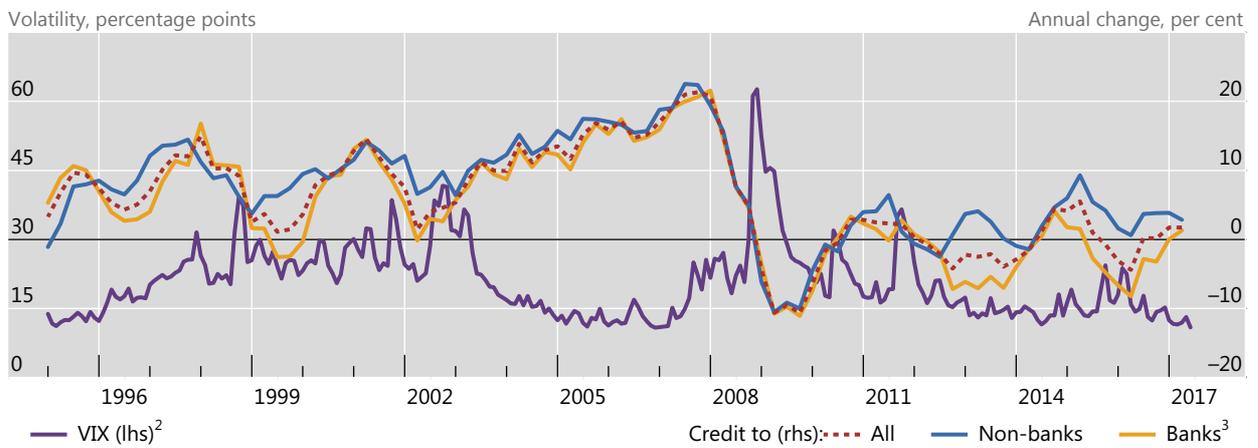
<sup>1</sup> The index ranges from 0 to 10,000, where a lower number indicates that there are many dealers with similar market shares (as measured by notional principal) and a higher number indicates that the market is dominated by a few reporting dealers. <sup>2</sup> Foreign exchange forwards, foreign exchange swaps and currency swaps.

Source: BIS derivatives statistics.

## E Global liquidity indicators

Growth of international bank credit<sup>1</sup>

Graph E.1



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

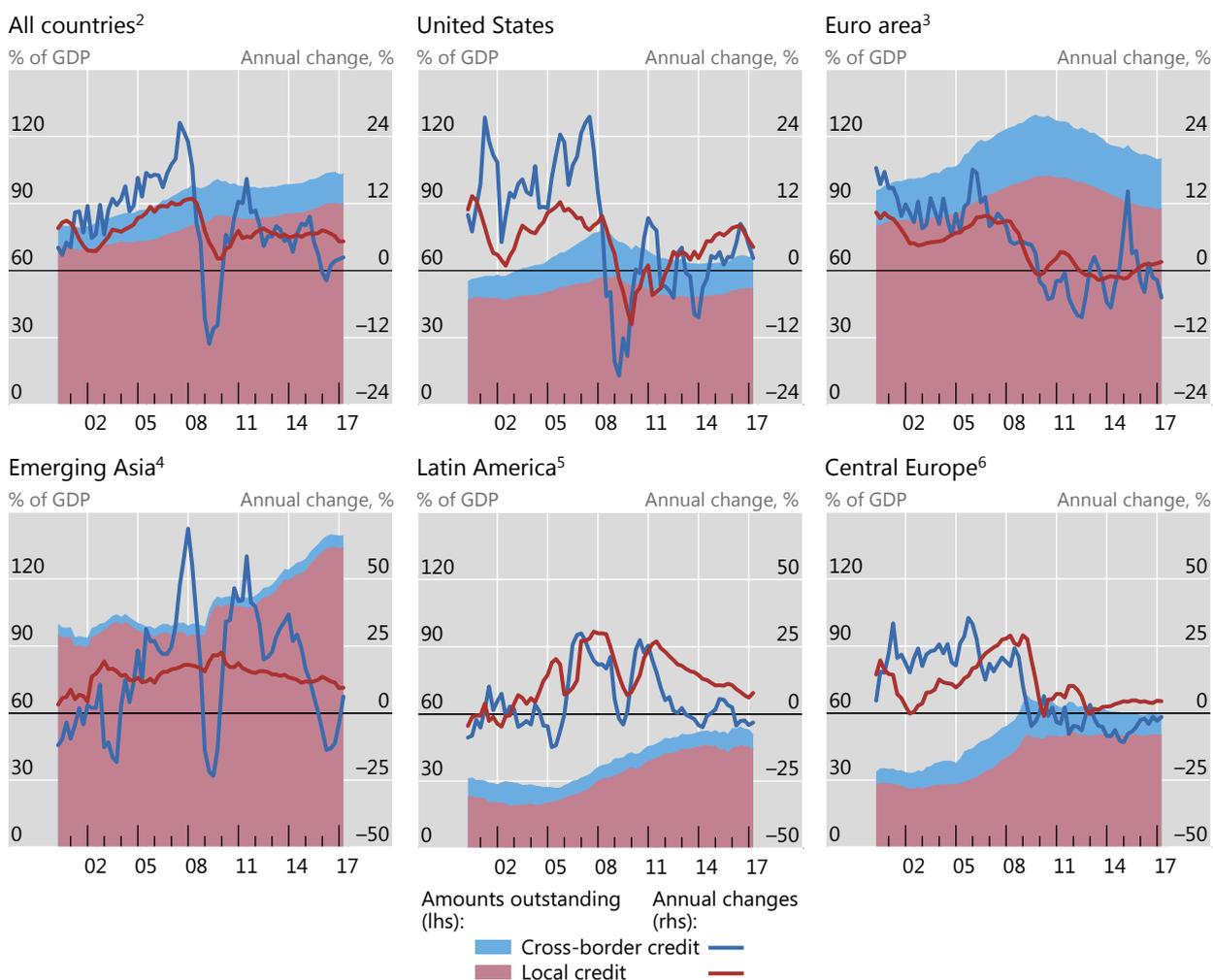
<sup>1</sup> LBS-reporting banks' cross-border claims plus local claims in foreign currencies. <sup>2</sup> Chicago Board Options Exchange S&P 500 implied volatility index; standard deviation, in percentage points per annum. <sup>3</sup> Including intragroup transactions.

Sources: Bloomberg; BIS locational banking statistics.

## Global bank credit to the private non-financial sector, by residence of borrower

Banks' cross-border credit plus local credit in all currencies<sup>1</sup>

Graph E.2



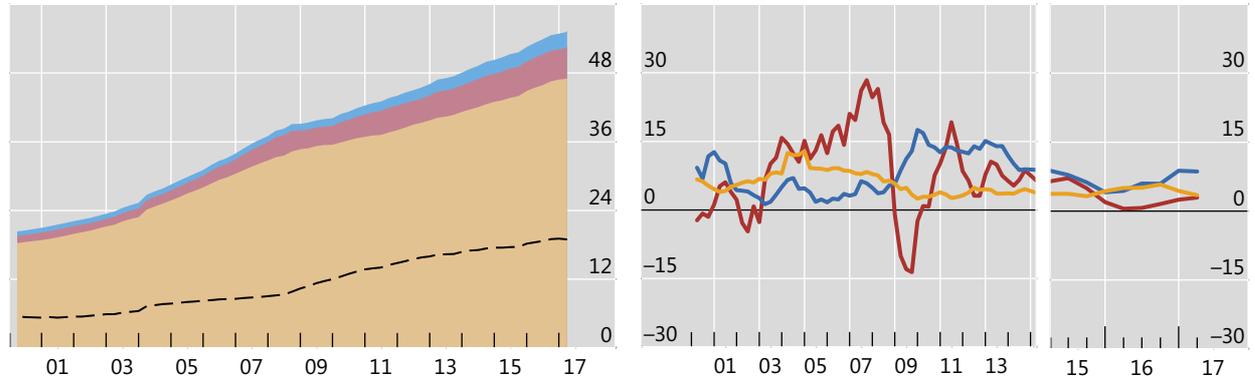
# Global credit to the non-financial sector, by currency

Graph E.3

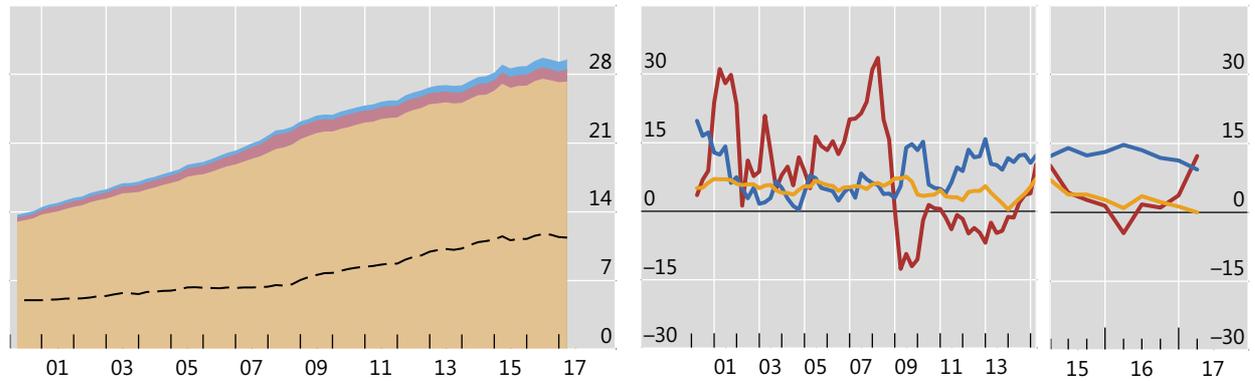
Amounts outstanding, in trillions of currency units<sup>1</sup>

Annual change, in per cent<sup>2</sup>

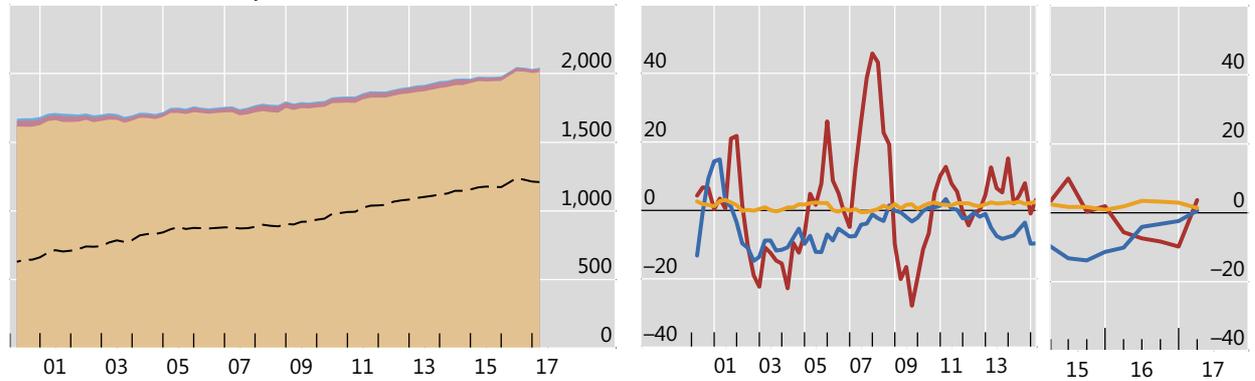
Credit denominated in US dollars (USD)



Credit denominated in euros (EUR)



Credit denominated in yen (JPY)



Credit to residents<sup>3</sup>
 Credit to non-residents: Debt securities<sup>4</sup>  
 Loans<sup>5</sup>  
 Credit to government

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

<sup>1</sup> Amounts outstanding at quarter-end. <sup>2</sup> Based on quarterly break- and exchange rate-adjusted changes. <sup>3</sup> Credit to non-financial borrowers residing in the United States/euro area/Japan. National financial accounts are adjusted using BIS banking and securities statistics to exclude credit denominated in non-local currencies. <sup>4</sup> Excluding debt securities issued by special purpose vehicles and other financial entities controlled by non-financial parents. EUR-denominated debt securities exclude those issued by institutions of the European Union. <sup>5</sup> Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans.

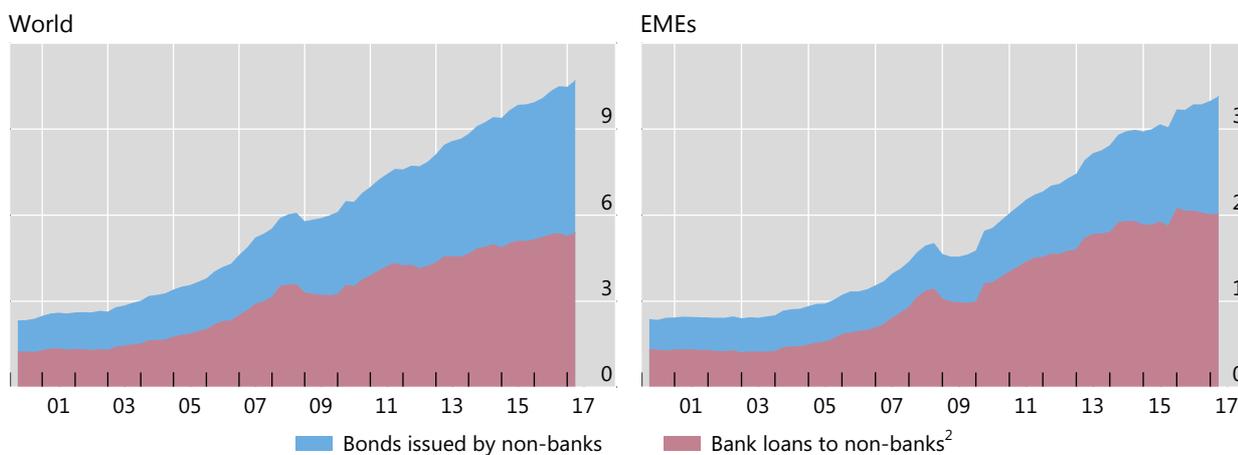
Sources: Bloomberg; Datastream; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; national data; BIS locational banking statistics (LBS); BIS calculations.

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

Amounts outstanding, in trillions of US dollars

Graph E.4



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

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

Sources: Bloomberg; Datastream; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; national data; BIS locational banking statistics (LBS); BIS calculations.

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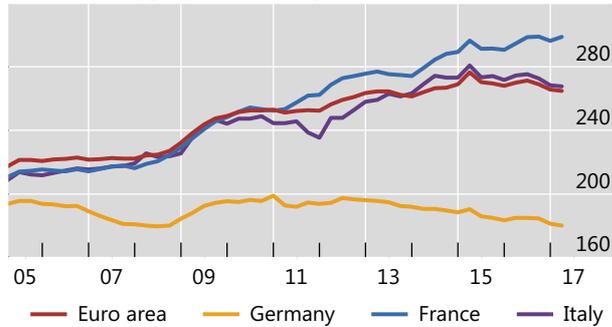
## F Statistics on total credit to the non-financial sector

### Total credit to the non-financial sector (core debt)

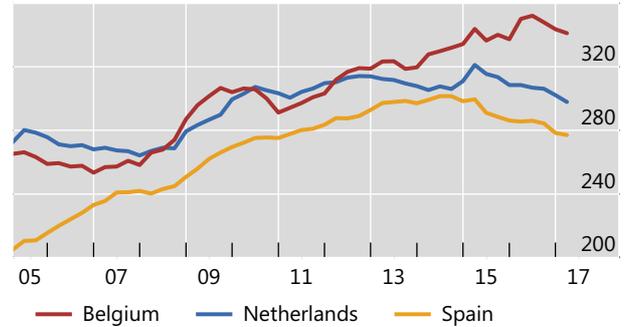
As a percentage of GDP

Graph F.1

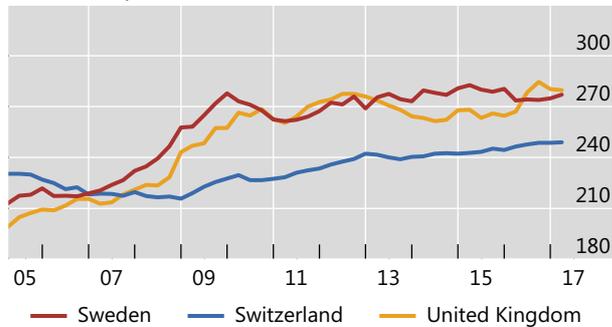
Euro area: aggregate and major countries



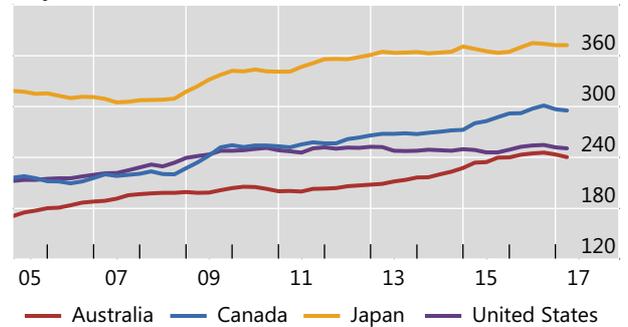
Euro area: other countries



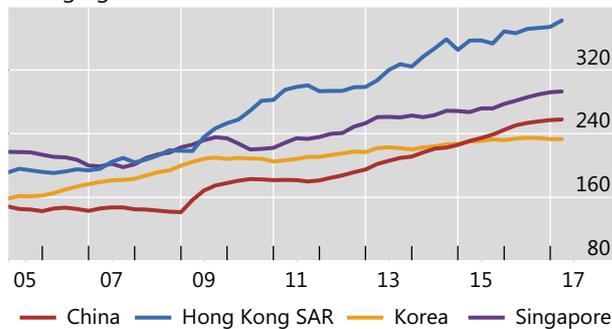
Other European countries



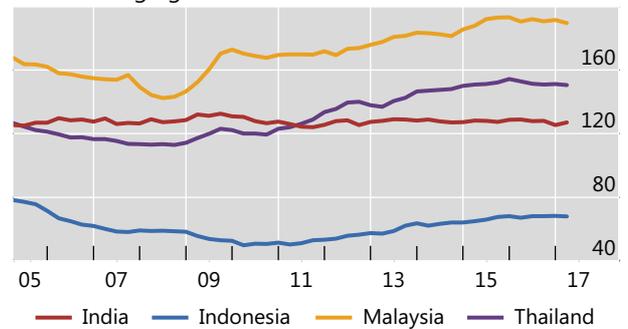
Major advanced economies



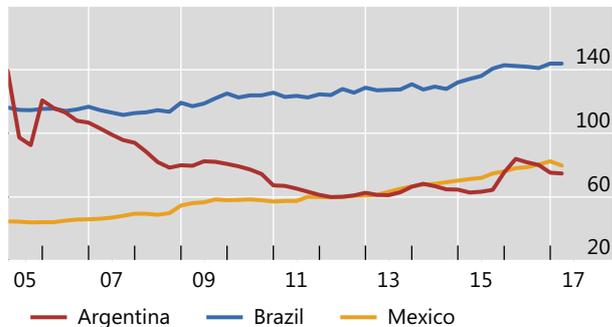
Emerging Asia



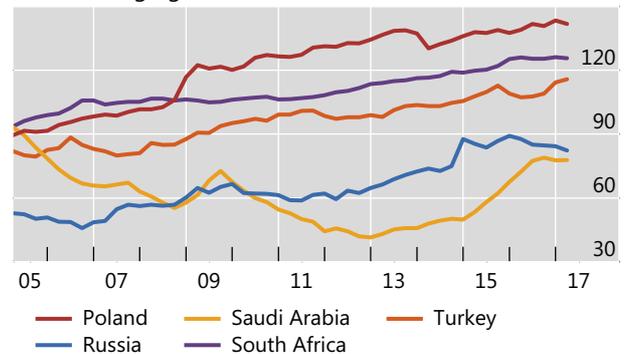
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at [www.bis.org/statistics/totcredit.htm](http://www.bis.org/statistics/totcredit.htm).

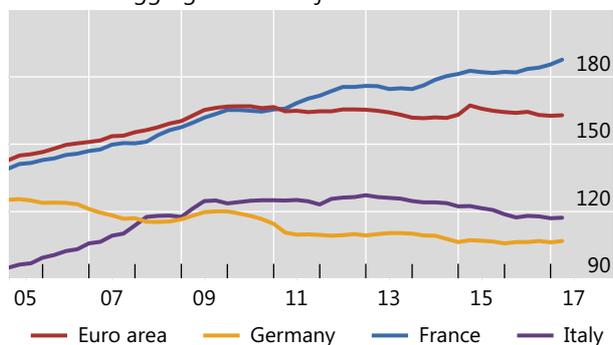
Source: BIS total credit statistics.

# Total credit to the private non-financial sector (core debt)

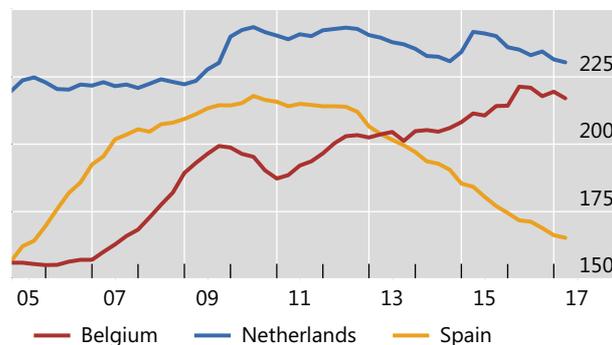
As a percentage of GDP

Graph F.2

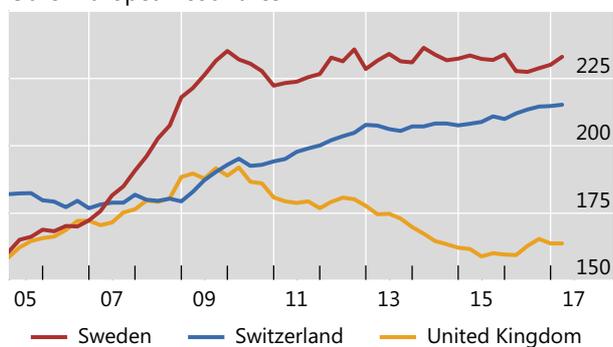
Euro area: aggregate and major countries



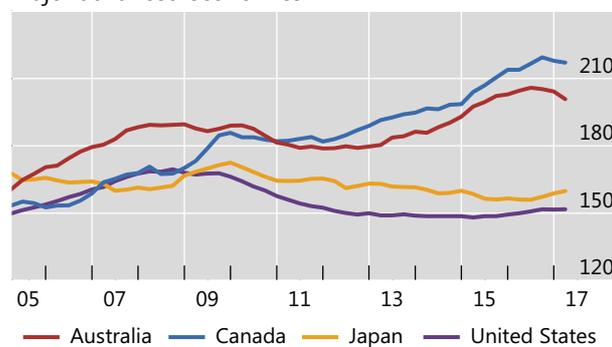
Euro area: other countries



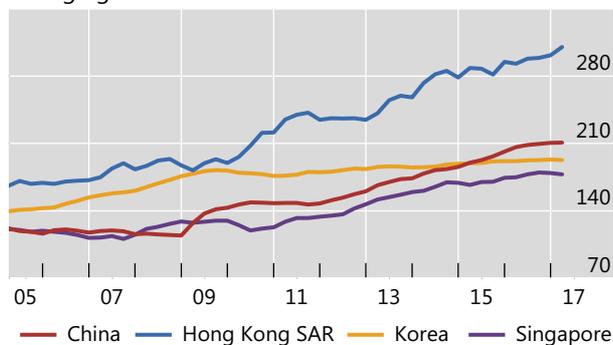
Other European countries



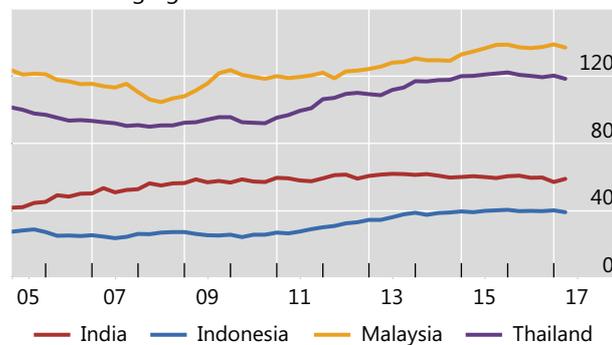
Major advanced economies



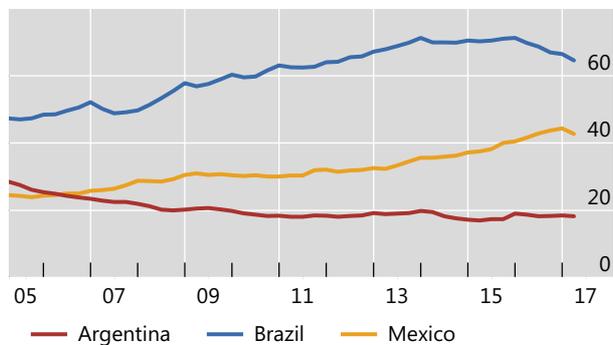
Emerging Asia



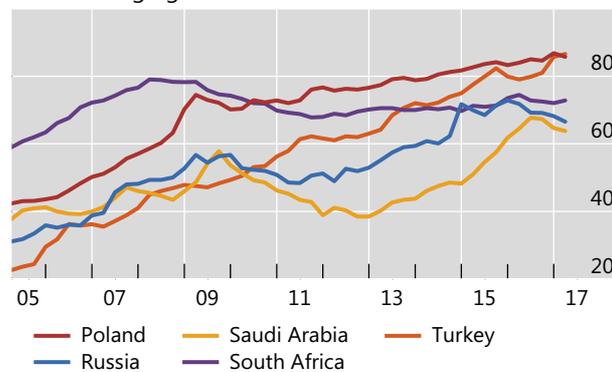
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at [www.bis.org/statistics/totcredit.htm](http://www.bis.org/statistics/totcredit.htm).

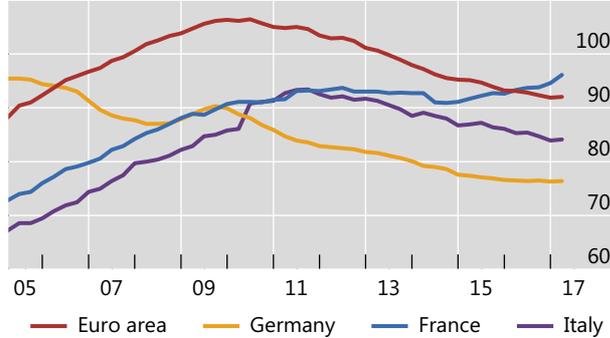
Source: BIS total credit statistics.

# Bank credit to the private non-financial sector (core debt)

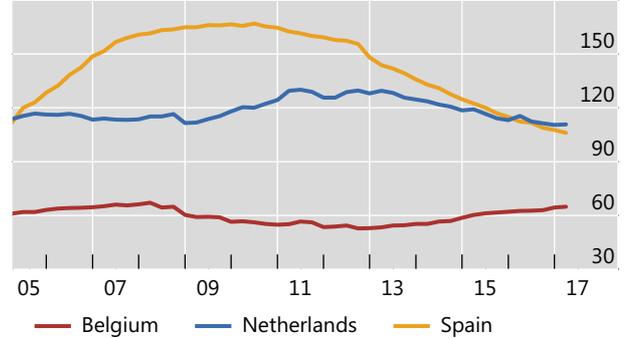
As a percentage of GDP

Graph F.3

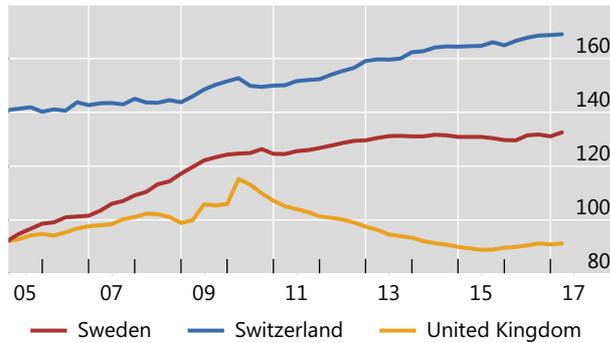
Euro area: aggregate and major countries



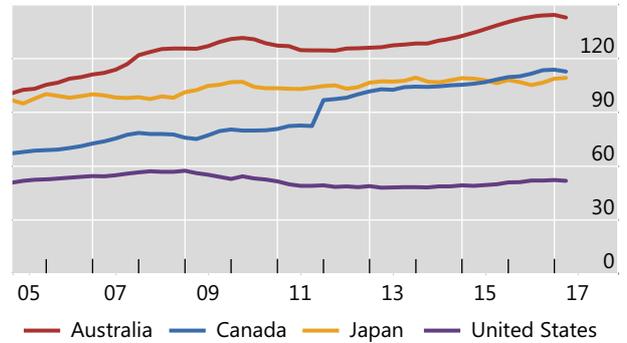
Euro area: other countries



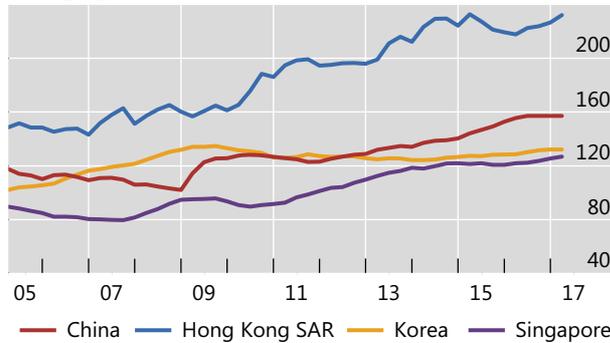
Other European countries



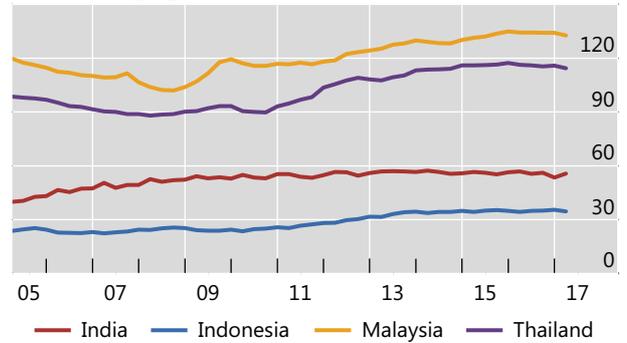
Major advanced economies



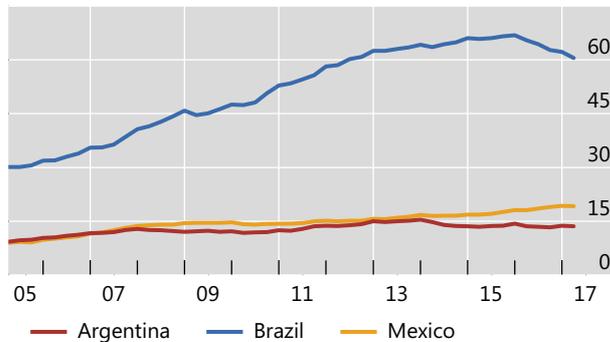
Emerging Asia



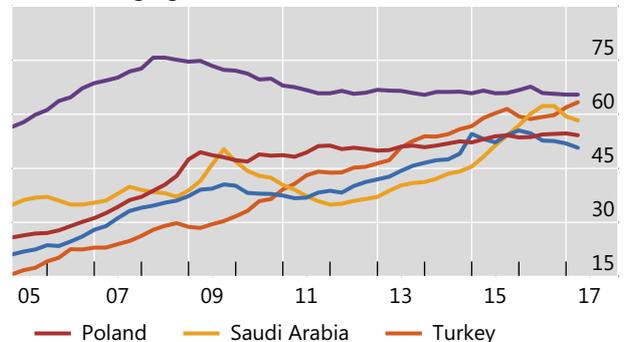
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at [www.bis.org/statistics/totcredit.htm](http://www.bis.org/statistics/totcredit.htm).

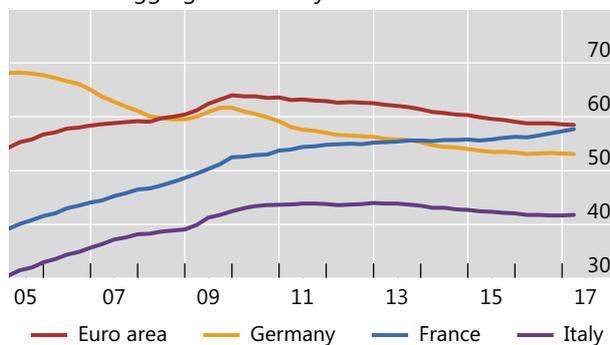
Source: BIS total credit statistics.

# Total credit to households (core debt)

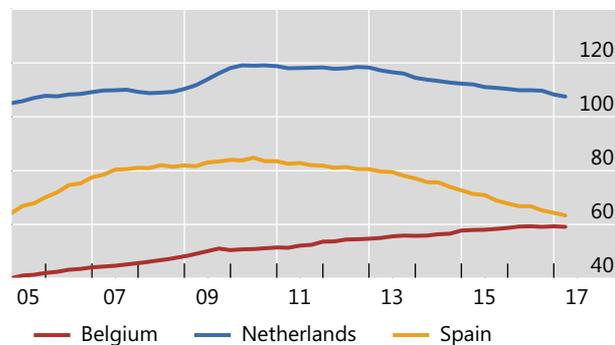
As a percentage of GDP

Graph F.4

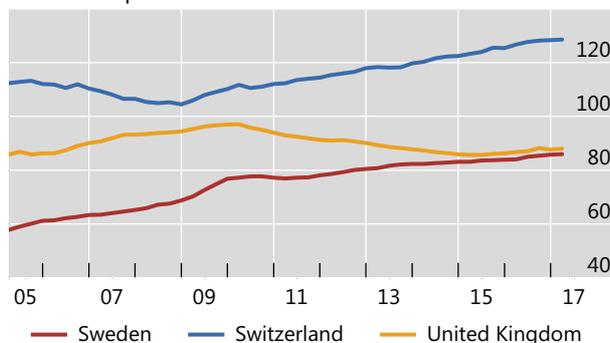
Euro area: aggregate and major countries



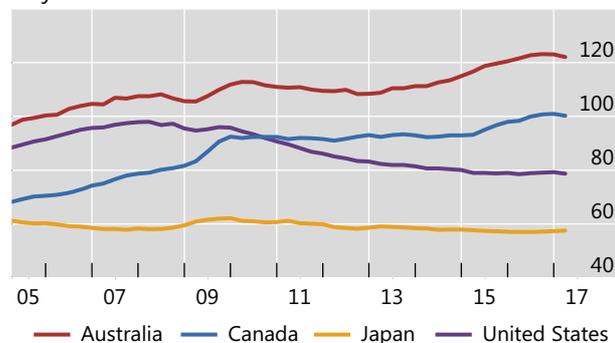
Euro area: other countries



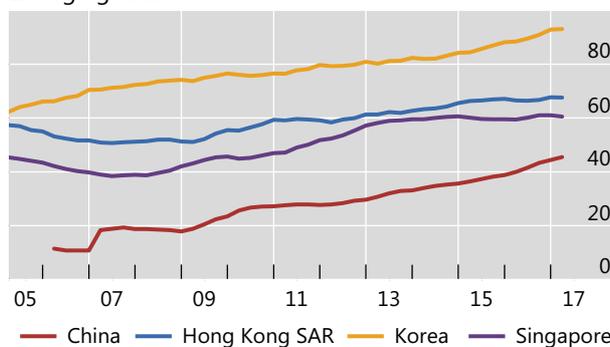
Other European countries



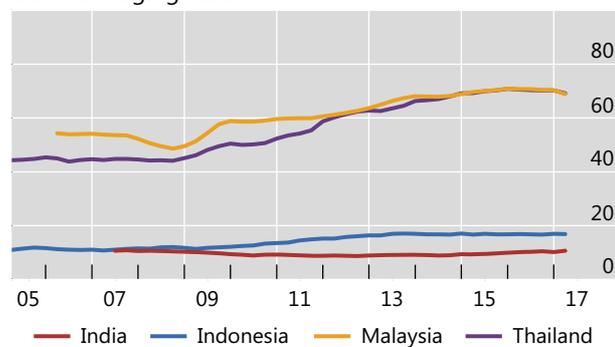
Major advanced economies



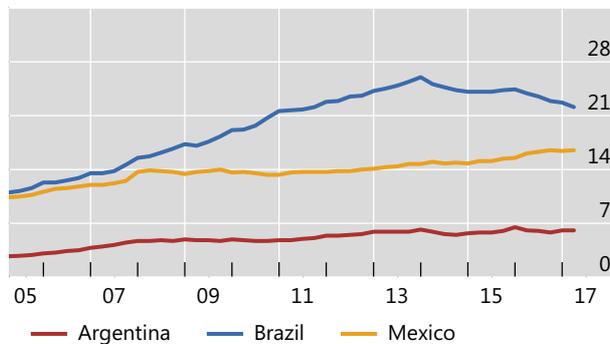
Emerging Asia



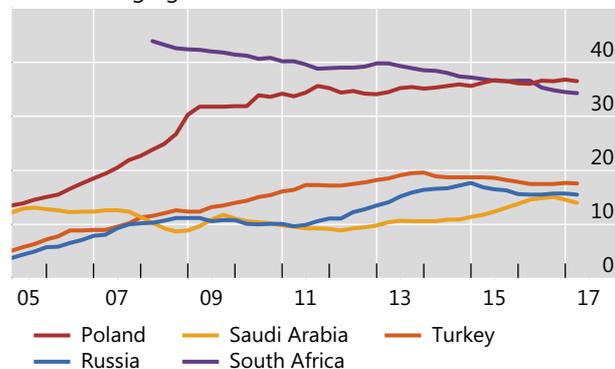
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at [www.bis.org/statistics/totcredit.htm](http://www.bis.org/statistics/totcredit.htm).

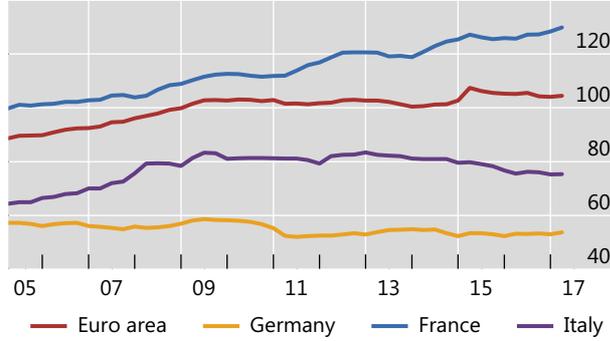
Source: BIS total credit statistics.

# Total credit to non-financial corporations (core debt)

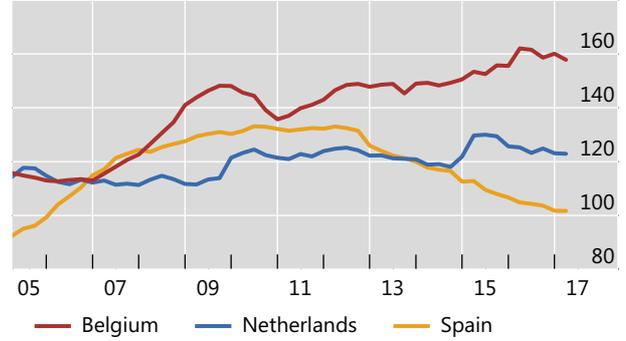
As a percentage of GDP

Graph F.5

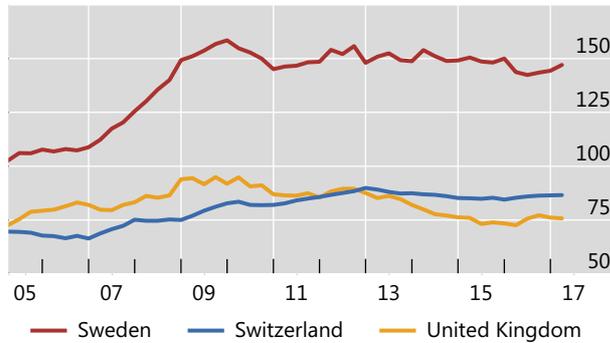
Euro area: aggregate and major countries



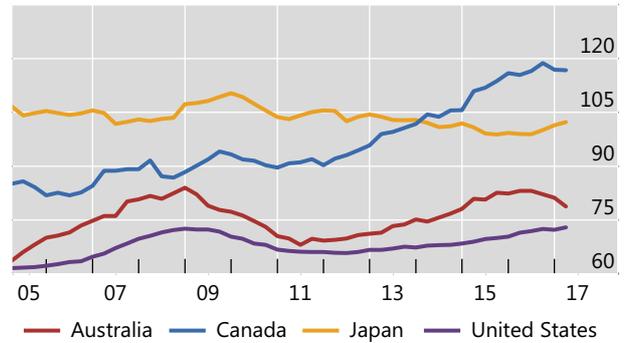
Euro area: other countries



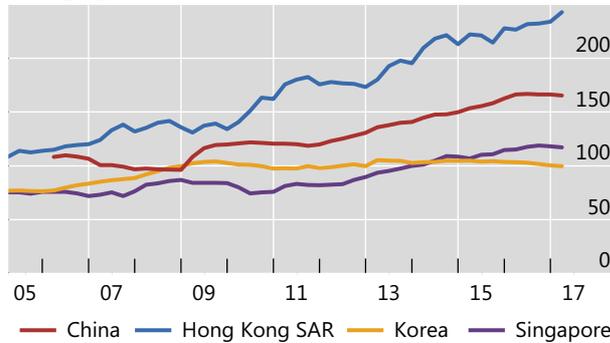
Other European countries



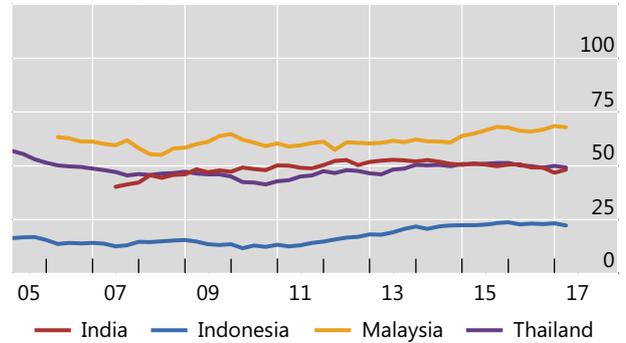
Major advanced economies



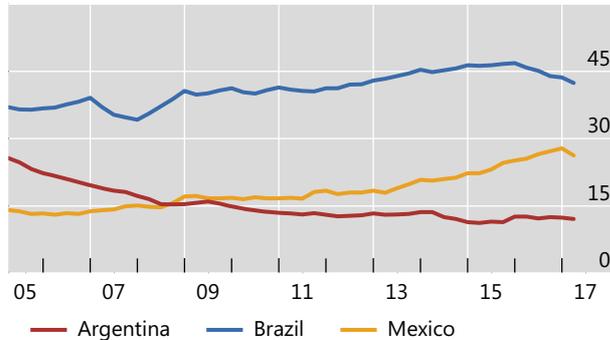
Emerging Asia



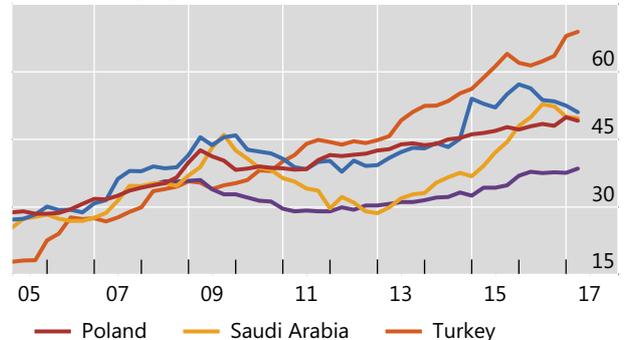
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at [www.bis.org/statistics/totcredit.htm](http://www.bis.org/statistics/totcredit.htm).

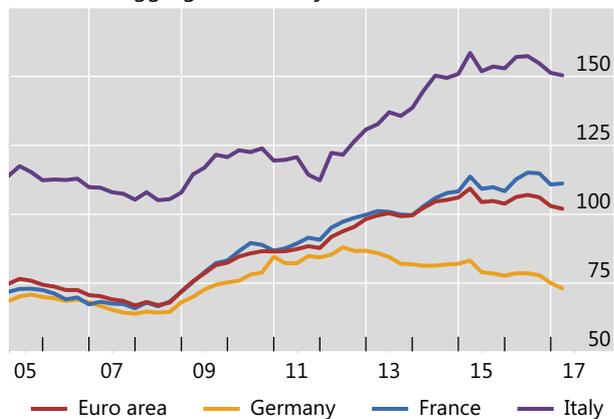
Source: BIS total credit statistics.

# Total credit to the government sector at market value (core debt)<sup>1</sup>

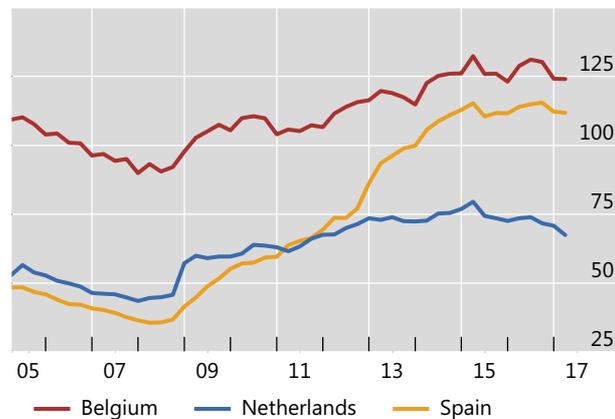
As a percentage of GDP

Graph F.6

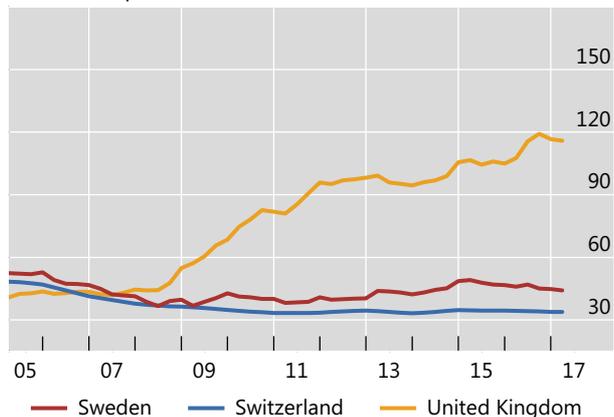
Euro area: aggregate and major countries



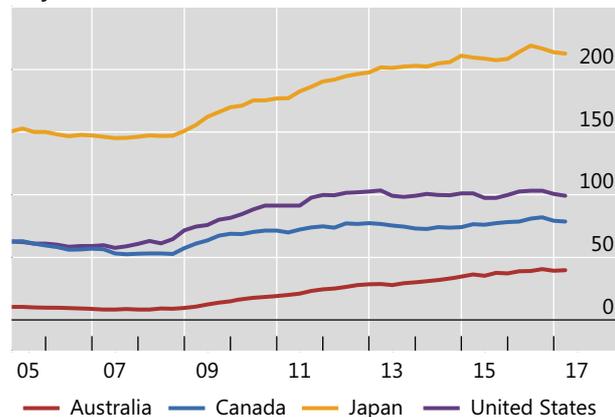
Euro area: other countries



Other European countries



Major advanced economies



Emerging Asia



Other emerging market economies



Further information on the BIS credit statistics is available at [www.bis.org/statistics/totcredit.htm](http://www.bis.org/statistics/totcredit.htm).

<sup>1</sup> Consolidated data for the general government sector.

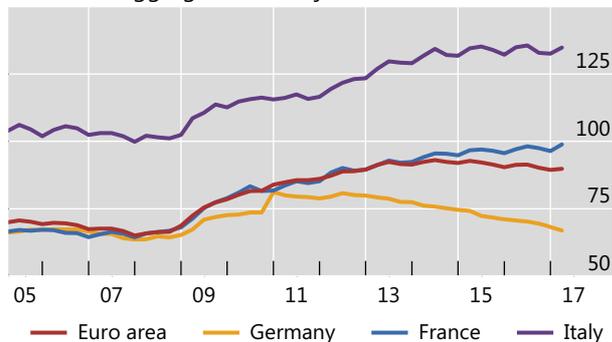
Source: BIS total credit statistics.

# Total credit to the government sector at nominal value (core debt)<sup>1</sup>

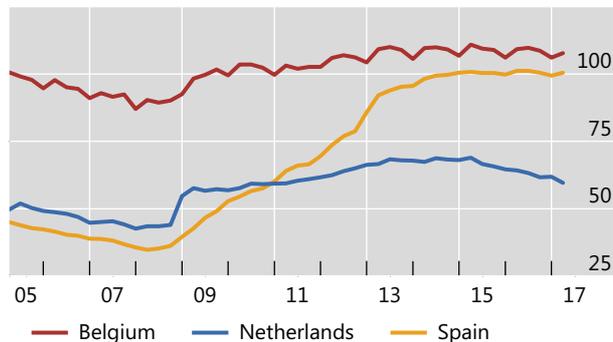
As a percentage of GDP

Graph F.7

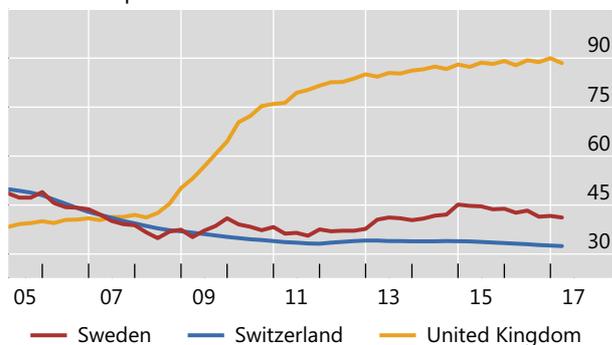
Euro area: aggregate and major countries



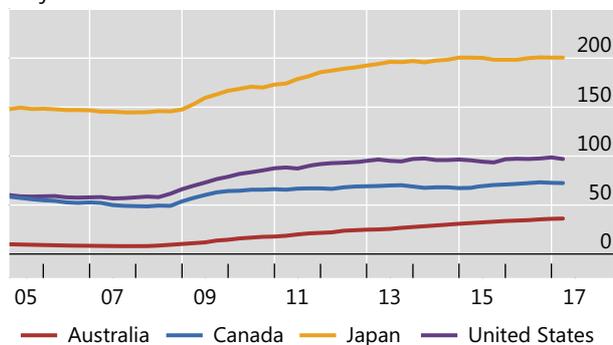
Euro area: other countries



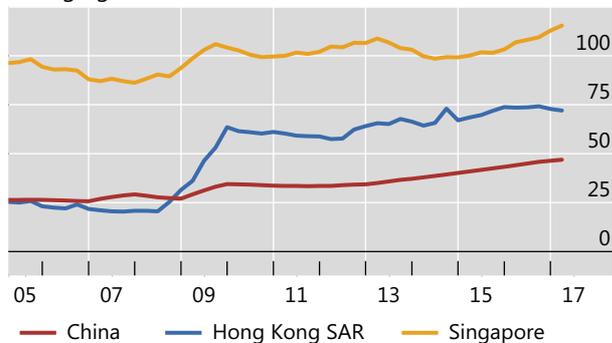
Other European countries



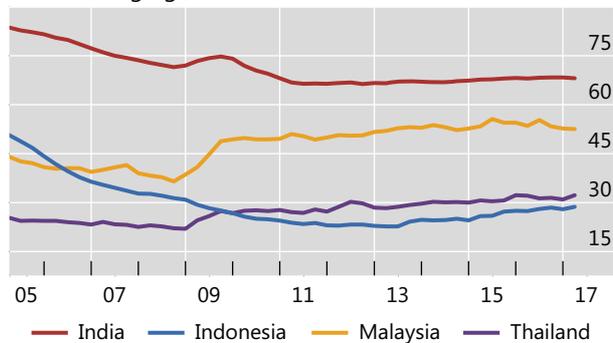
Major advanced economies



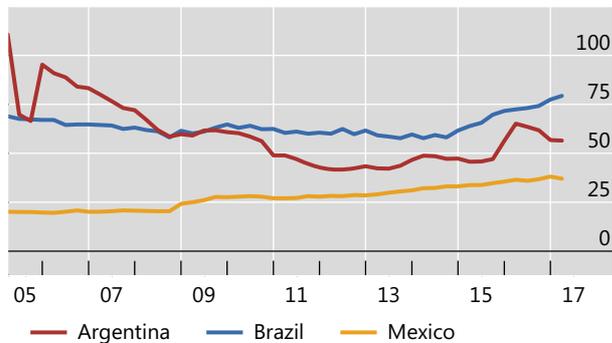
Emerging Asia



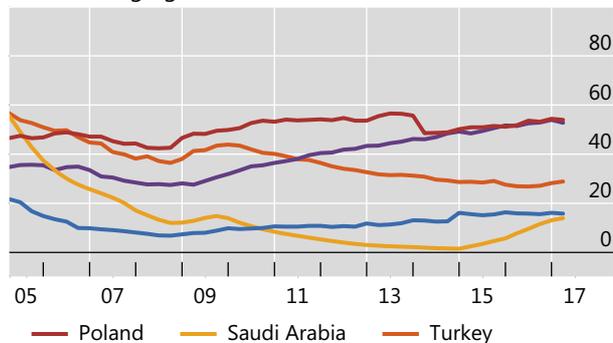
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at [www.bis.org/statistics/totcredit.htm](http://www.bis.org/statistics/totcredit.htm).

<sup>1</sup> Consolidated data for the general government sector; central government for Argentina, Indonesia, Malaysia, Mexico, Saudi Arabia and Thailand.

Source: BIS total credit statistics.

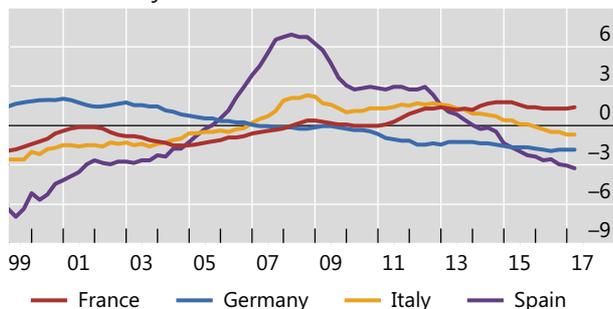
## G Debt service ratios for the private non-financial sector

### Debt service ratios of the private non-financial sector

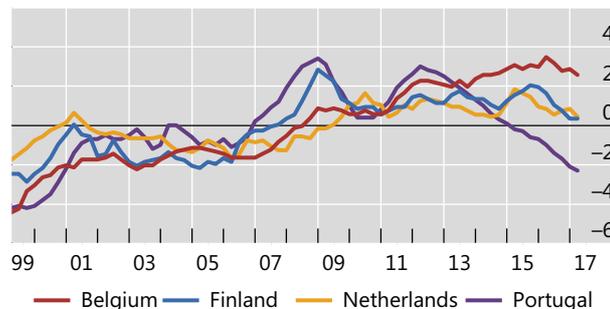
Deviation from country-specific mean, in percentage points<sup>1</sup>

Graph G.1

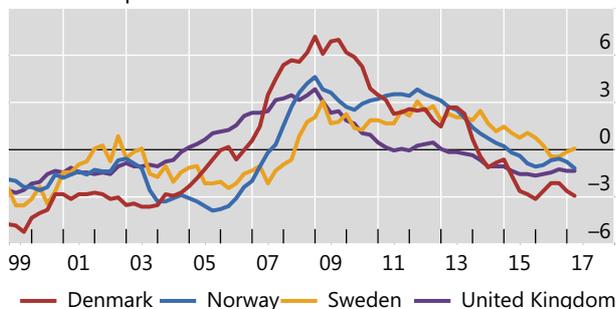
#### Euro area: major countries



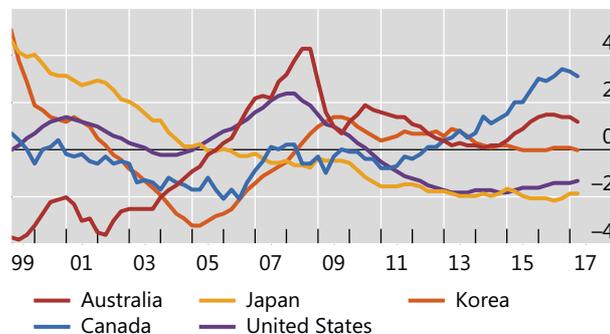
#### Euro area: other countries



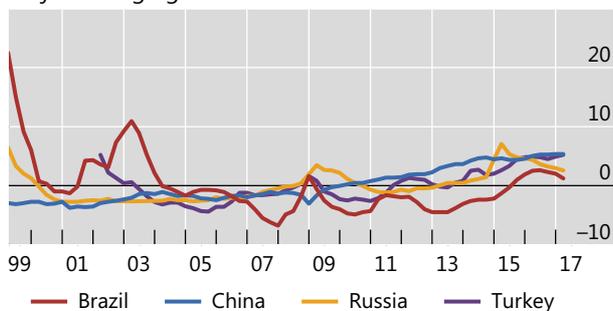
#### Other European countries



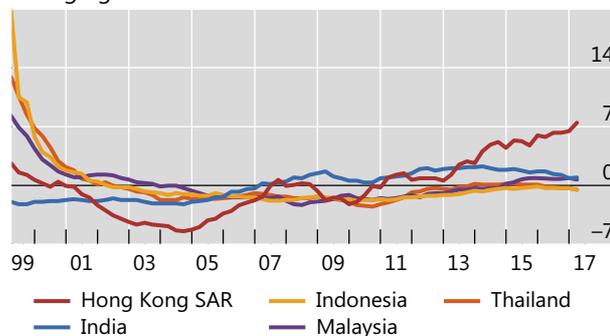
#### Other economies



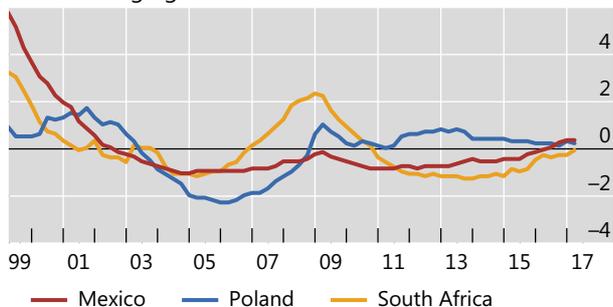
#### Major emerging markets<sup>2</sup>



#### Emerging Asia<sup>2</sup>



#### Other emerging markets<sup>2</sup>



Further information on the BIS debt service ratio statistics is available at [www.bis.org/statistics/dsr.htm](http://www.bis.org/statistics/dsr.htm).

<sup>1</sup> Country-specific means are based on all available data from 1999 onwards. <sup>2</sup> Countries which are using alternative measures of income and interest rates. Further information is available under "Methodology and data for DSR calculation" at [www.bis.org/statistics/dsr.htm](http://www.bis.org/statistics/dsr.htm).

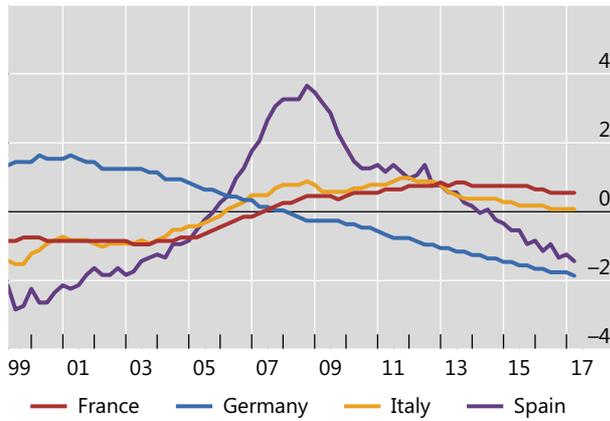
Source: BIS debt service ratios statistics.

## Debt service ratios of households

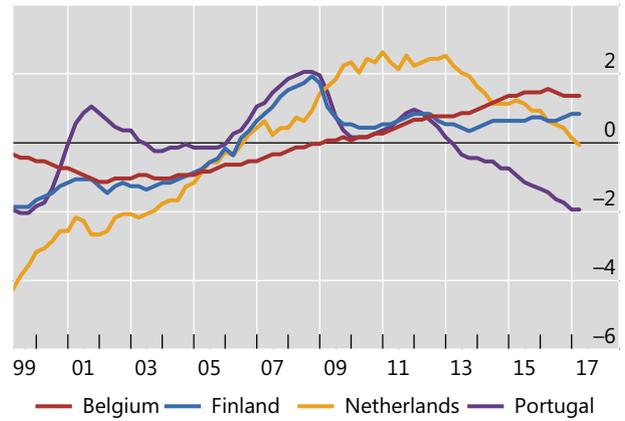
Deviation from country-specific mean, in percentage points<sup>1</sup>

Graph G.2

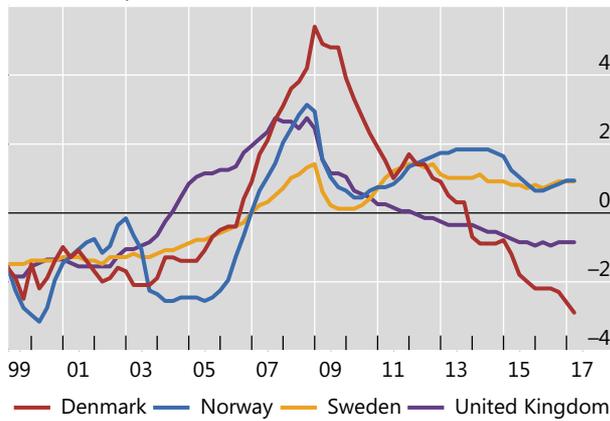
Euro area: major countries



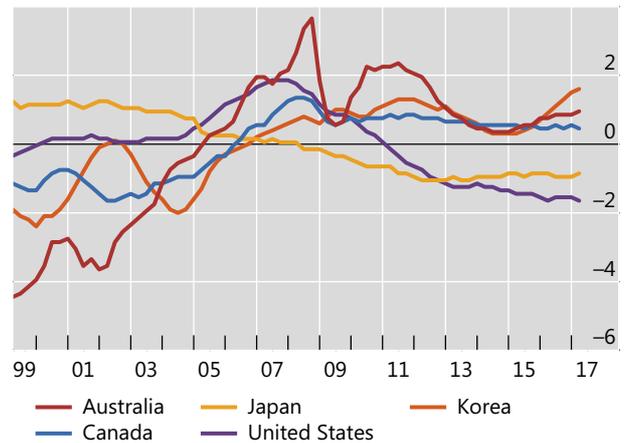
Euro area: other countries



Other European countries



Other economies



Further information on the BIS debt service ratio statistics is available at [www.bis.org/statistics/dsr.htm](http://www.bis.org/statistics/dsr.htm).

<sup>1</sup> Country-specific means are based on all available data from 1999 onwards.

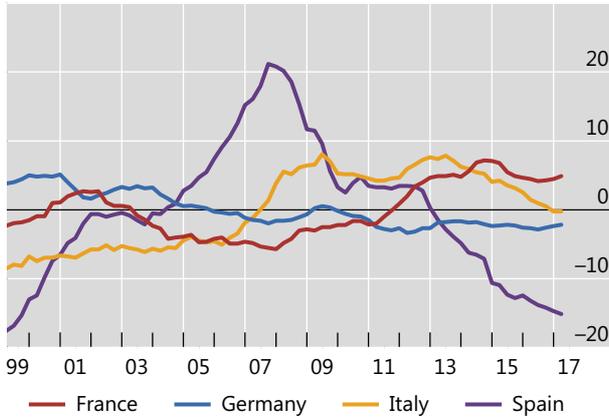
Source: BIS debt service ratios statistics.

## Debt service ratios of non-financial corporations

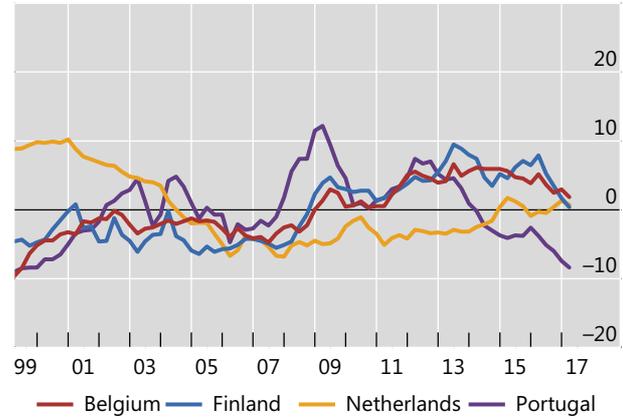
Deviation from country-specific mean, in percentage points<sup>1</sup>

Graph G.3

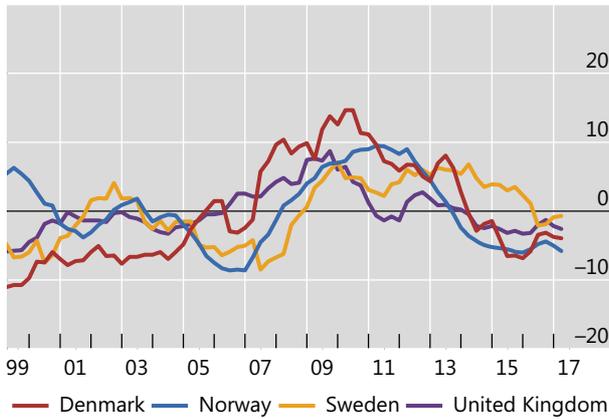
Euro area: major countries



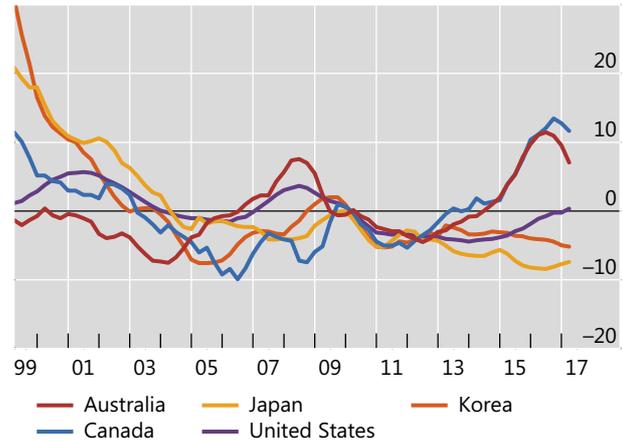
Euro area: other countries



Other European countries



Other economies



Further information on the BIS debt service ratio statistics is available at [www.bis.org/statistics/dsr.htm](http://www.bis.org/statistics/dsr.htm).

<sup>1</sup> Country-specific means are based on all available data from 1999 onwards.

Source: BIS debt service ratios statistics.

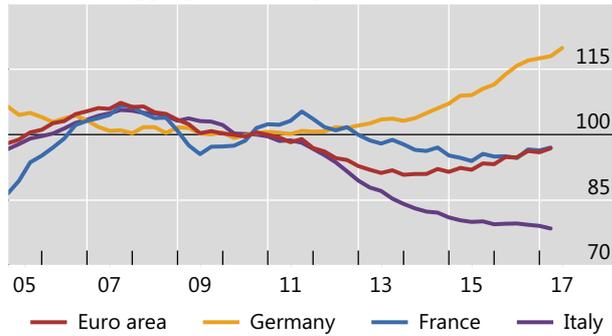
## H Property price statistics

### Real residential property prices

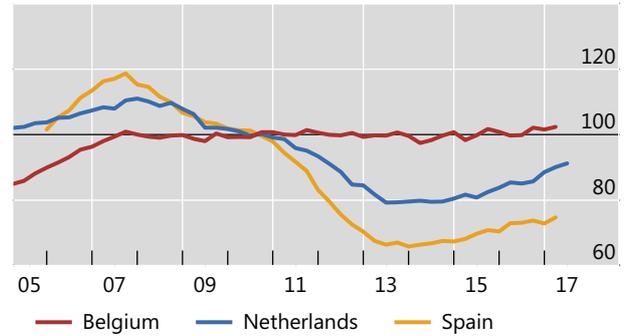
CPI-deflated, 2010 = 100

Graph H.1

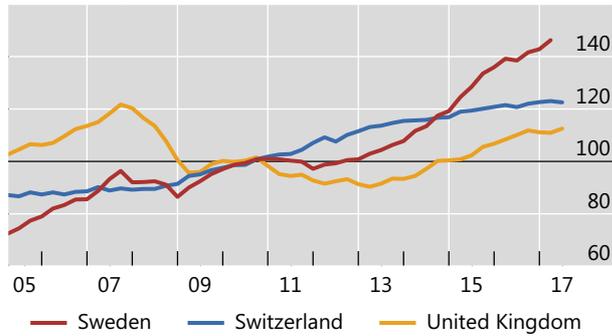
Euro area: aggregate and major countries



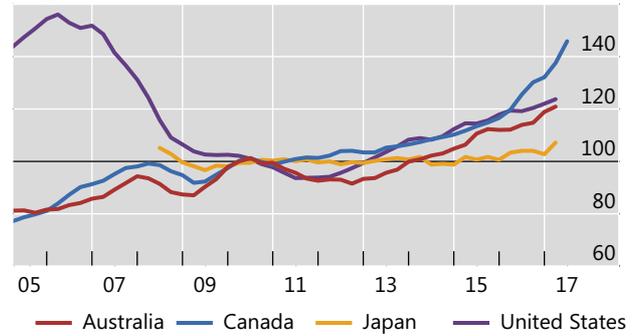
Euro area: other countries



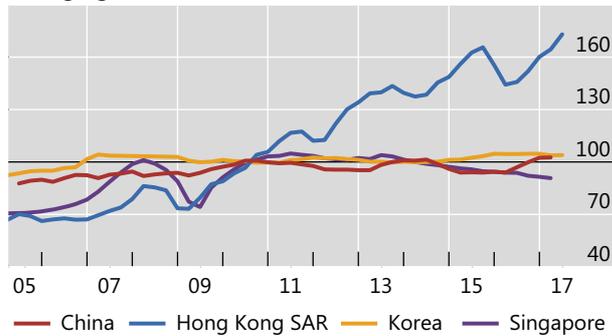
Other European countries



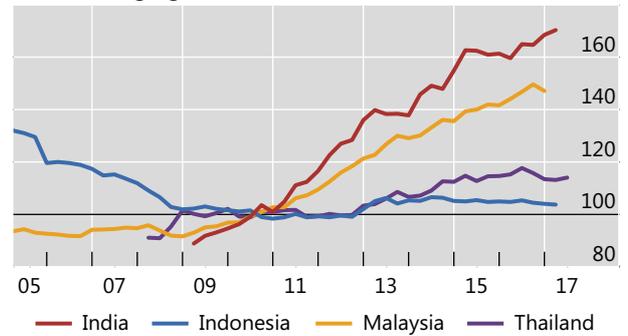
Major advanced economies



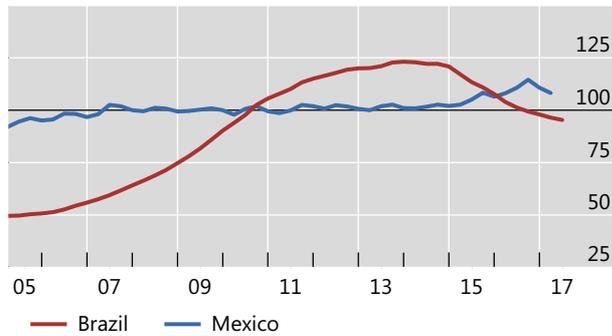
Emerging Asia



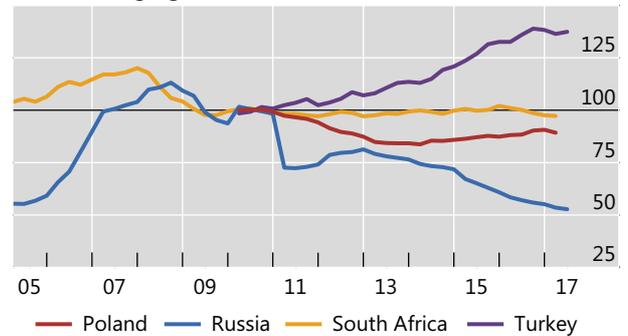
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS property price statistics is available at [www.bis.org/statistics/pp.htm](http://www.bis.org/statistics/pp.htm).

Source: BIS property prices statistics.

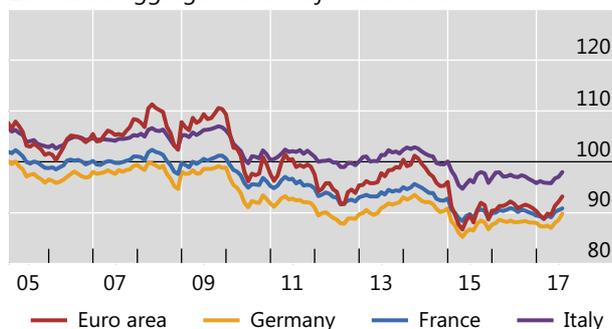
## I Effective and US dollar exchange rate statistics

### Real effective exchange rates

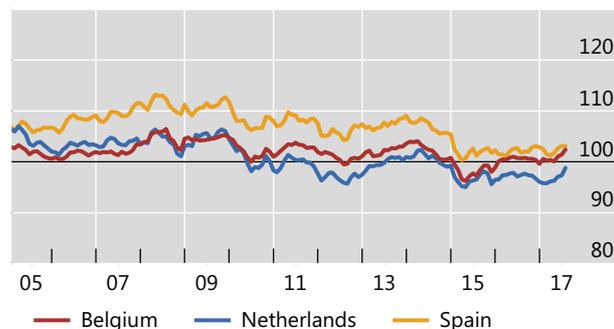
CPI-based, 1995–2005 = 100<sup>1</sup>

Graph I.1

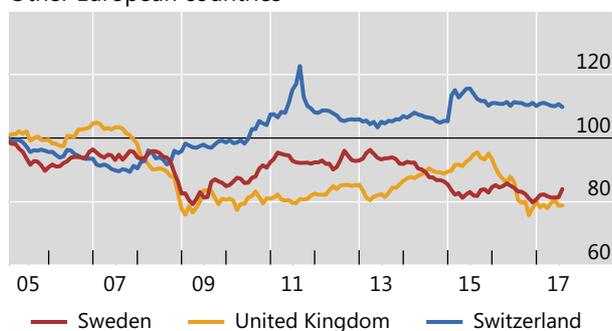
#### Euro area: aggregate and major countries



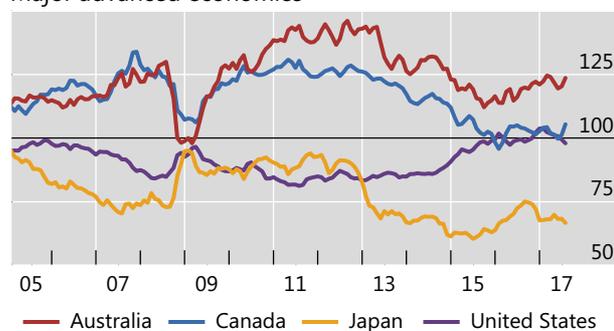
#### Euro area: other countries



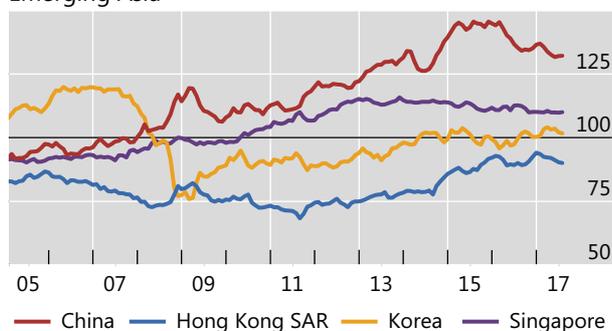
#### Other European countries



#### Major advanced economies



#### Emerging Asia



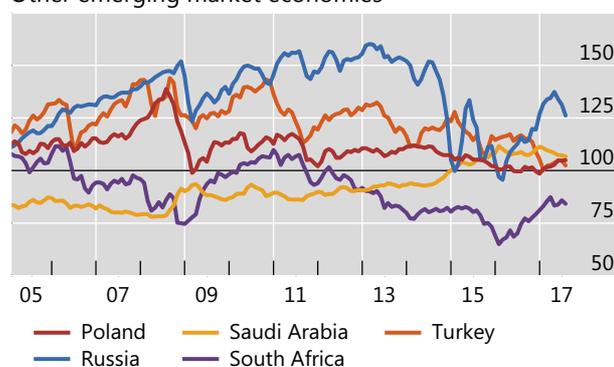
#### Other emerging Asia



#### Latin America



#### Other emerging market economies



Further information on the BIS effective exchange rate statistics is available at [www.bis.org/statistics/eer.htm](http://www.bis.org/statistics/eer.htm).

<sup>1</sup> An increase indicates a real-term appreciation of the local currency against a broad basket of currencies.

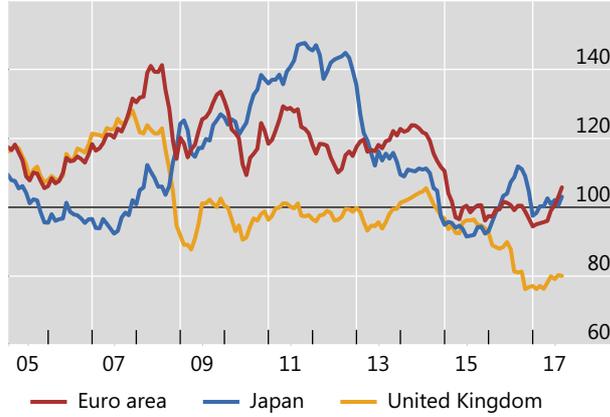
Source: BIS effective exchange rates statistics.

# US dollar exchange rates

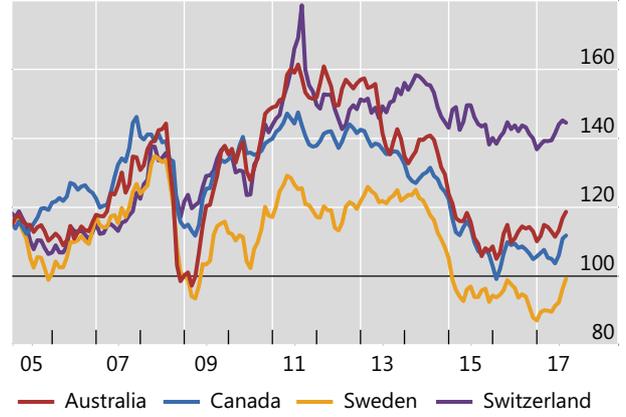
Indices, 1995–2005 = 100<sup>1</sup>

Graph I.2

## Major advanced economies



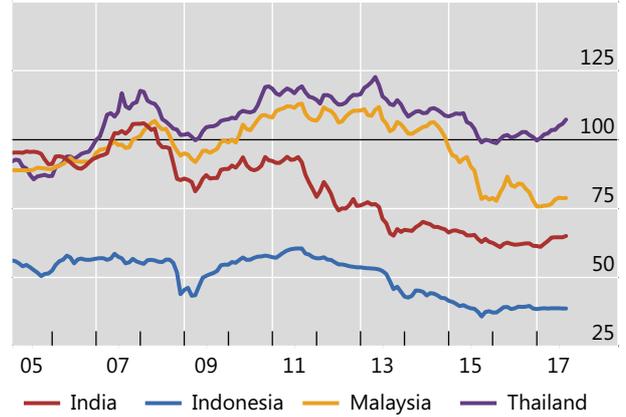
## Other advanced economies



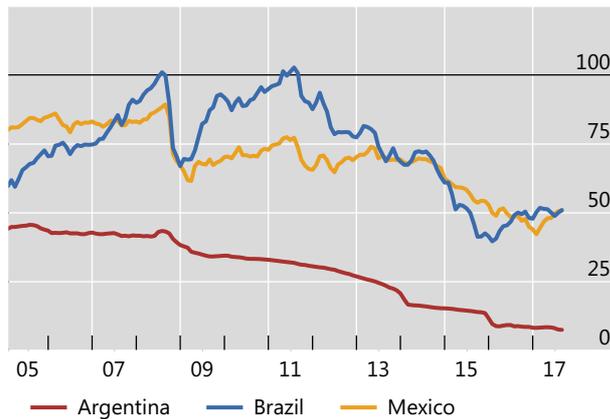
## Emerging Asia



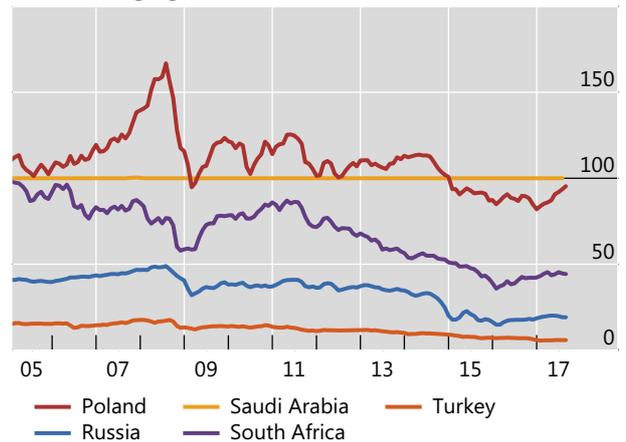
## Other emerging Asia



## Latin America



## Other emerging market economies



Further information on the exchange rate statistics is available at [www.bis.org/statistics/xrusd.htm](http://www.bis.org/statistics/xrusd.htm).

<sup>1</sup> An increase indicates an appreciation of the local currency against the US dollar.

Source: BIS US dollar exchange rates statistics.

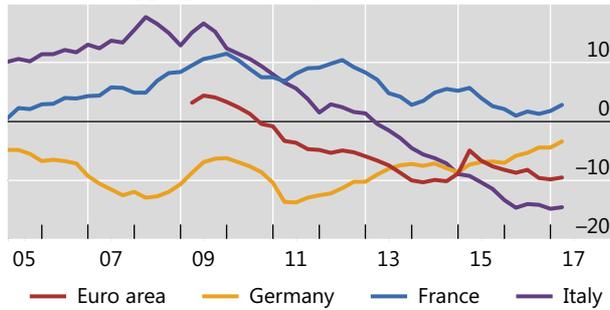
## J Credit-to-GDP gaps

### Credit-to-GDP gaps

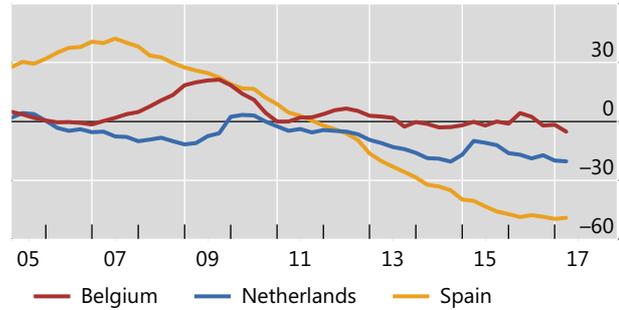
In percentage points of GDP

Graph J.1

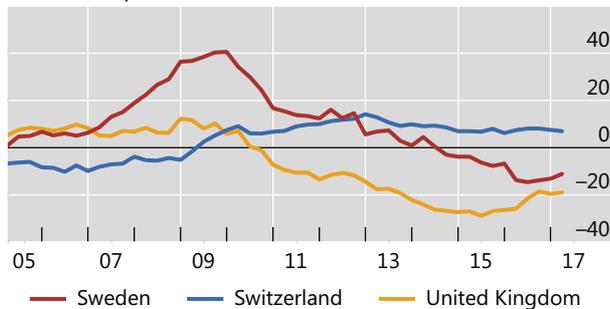
Euro area: aggregate and major countries



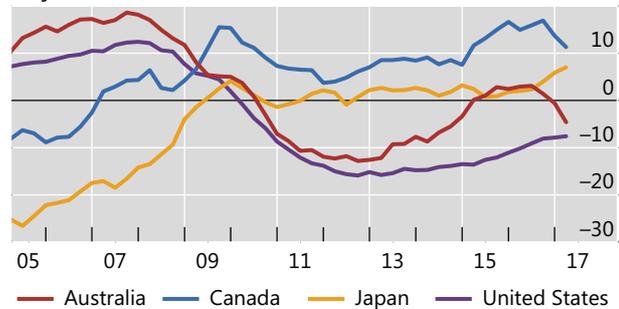
Euro area: other countries



Other European countries



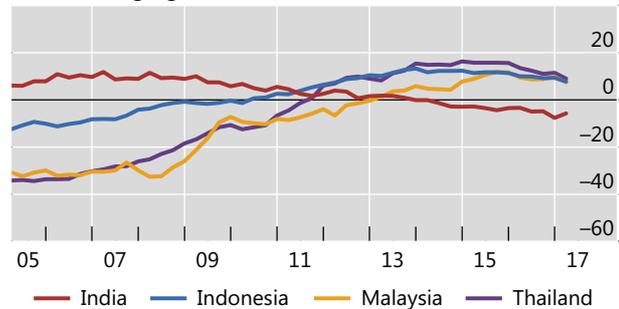
Major advanced economies



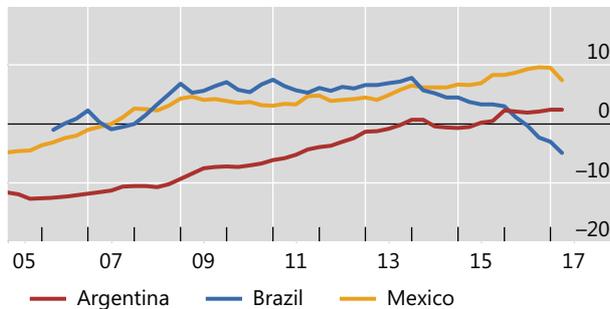
Emerging Asia



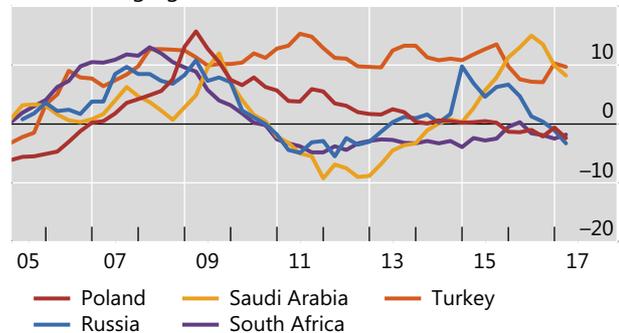
Other emerging Asia



Latin America



Other emerging market economies



<sup>1</sup> Estimates based on series on total credit to the private non-financial sector. The credit-to-GDP gap is defined as the difference between the credit-to-GDP ratio and its long-term trend; the long-term trend is calculated using a one-sided Hodrick-Prescott filter with a smoothing parameter of 400,000. Further information on the BIS credit-to-GDP gaps is available at [www.bis.org/statistics/c\\_gaps.htm](http://www.bis.org/statistics/c_gaps.htm).

Source: BIS credit-to-GDP gaps statistics.

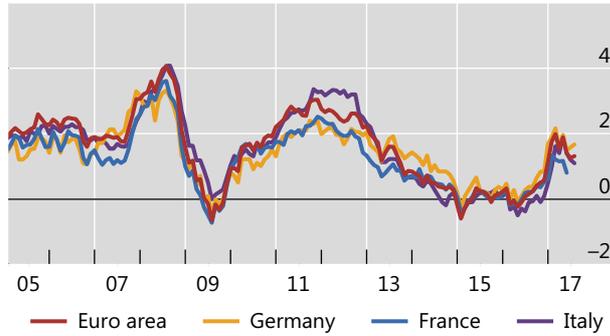
## K Consumer prices

### Consumer prices

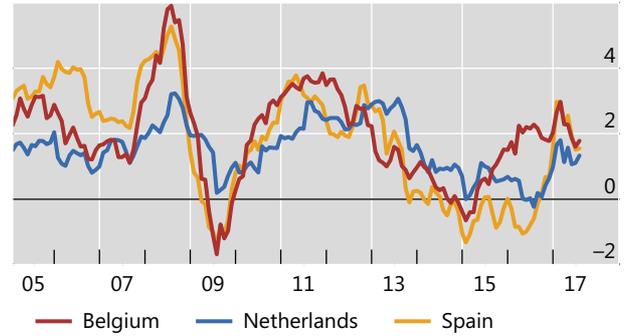
Year-on-year percentage changes

Graph K.1

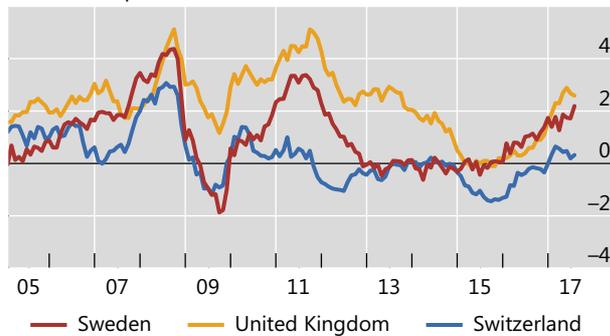
Euro area: aggregate and major countries



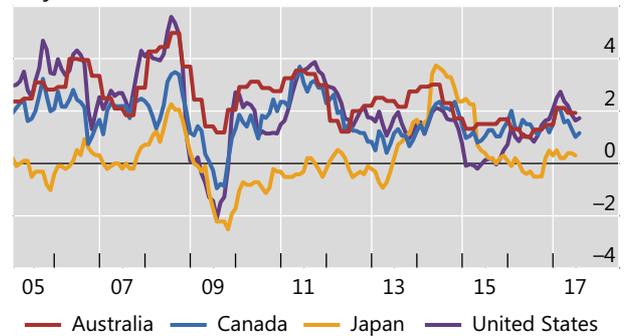
Euro area: other countries



Other European countries



Major advanced economies



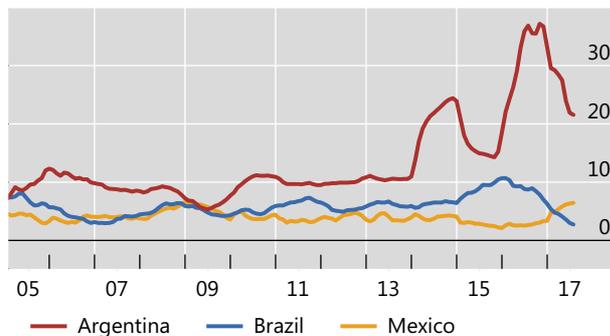
Emerging Asia



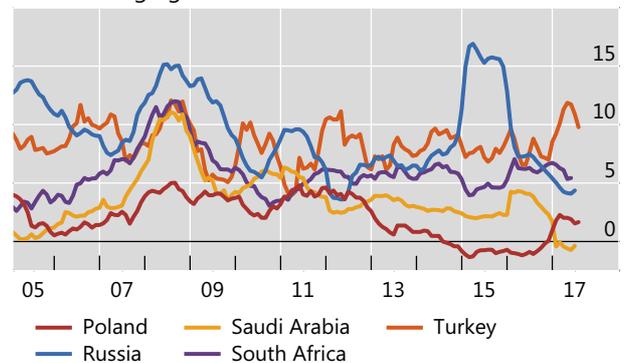
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS consumer prices is available at [www.bis.org/statistics/cp.htm](http://www.bis.org/statistics/cp.htm).

Source: BIS consumer price statistics.

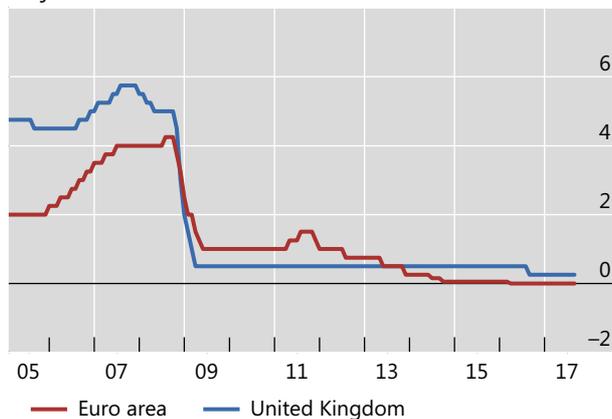
## L Central bank policy rates

### Central bank policy or representative rates

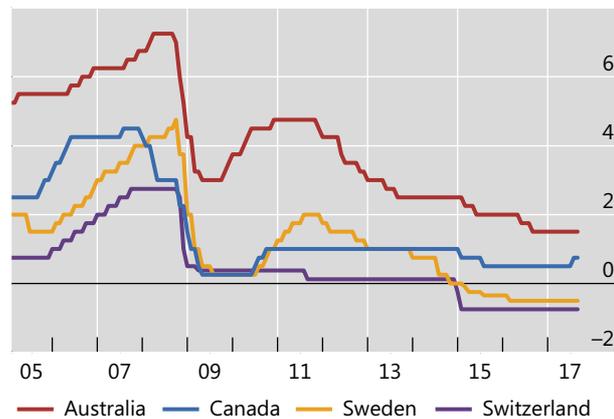
Month-end; in per cent

Graph L.1

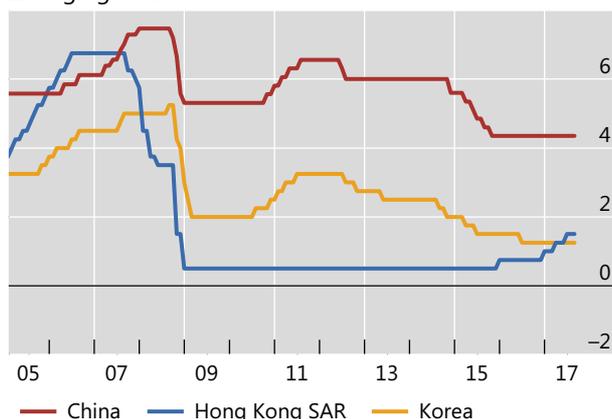
#### Major advanced economies



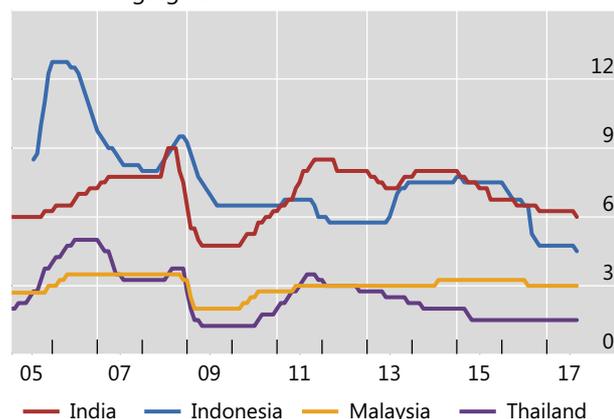
#### Other advanced economies



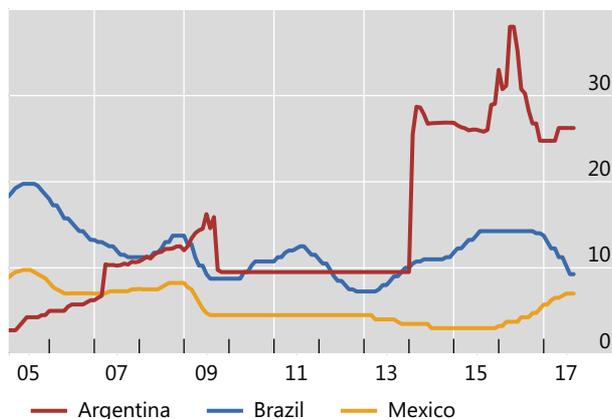
#### Emerging Asia



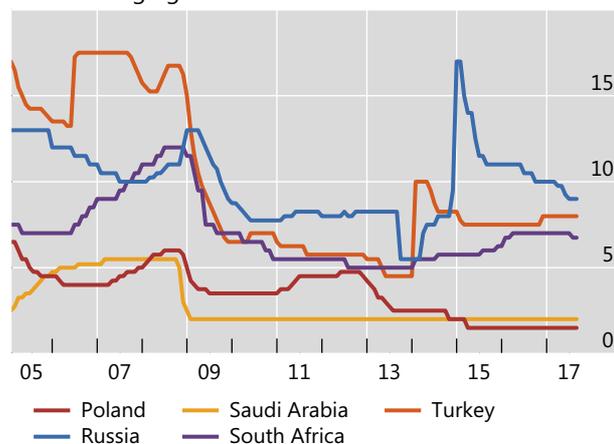
#### Other emerging Asia



#### Latin America



#### Other emerging market economies



Further information on the policy rates is available at [www.bis.org/statistics/cbppl.htm](http://www.bis.org/statistics/cbppl.htm).

Source: BIS policy rates statistics.

## Special features in the BIS Quarterly Review

March 2017	Consumption-led expansions	Enisse Kharroubi & Emanuel Kohlscheen
March 2017	The new era of expected credit loss provisioning	Benjamin Cohen & Gerald Edwards Jr
March 2017	The quest for speed in payments	Morten Bech, Yuuki Shimizu and Paul Wong
March 2017	The bond benchmark continues to tip to swaps	Lawrence Kreicher, Robert McCauley & Philip Wooldridge
December 2016	Downsized FX markets: causes and implications	Michael Moore, Andreas Schrimpf and Vladyslav Sushko
December 2016	The changing shape of interest rate derivatives markets	Torsten Ehlers & Egemen Eren
December 2016	Emerging derivatives markets?	Christian Upper & Marcos Valli
December 2016	Non-deliverable forwards: impact of currency internationalisation and derivatives reform	Robert McCauley & Chang Shu
December 2016	Does the financial channel of exchange rates offset the trade channel?	Jonathan Kerns & Nikhil Patel
September 2016	Covered interest parity lost: understanding the cross-currency basis	Claudio Borio, Robert McCauley, Patrick McGuire & Vladyslav Sushko
September 2016	Foreign exchange market intervention in EMEs: what has changed?	Dietrich Domanski, Emanuel Kohlscheen & Ramon Moreno
September 2016	Domestic financial markets and offshore bond financing	Jose Maria Serena & Ramon Moreno
September 2016	The ECB's QE and euro cross-border bank lending	Stefan Avdjiev, Agne Subelyte & Elod Takats

# Recent BIS publications<sup>1</sup>

## BIS Papers

### **Building Resilience to Global Risks: Challenges for African Central Banks** **BIS Papers No 93, August 2017**

The policy response of many African commodity exporting economies to the slump in commodity prices after mid-2014 has been markedly different from that of commodity exporters elsewhere. First, few African countries allowed their currency to depreciate as much as other EMEs, for instance in Latin America. Instead they resorted mainly to administrative controls, despite the high economic costs associated with such measures. Second, many African economies kept their policy rates very low despite considerable exchange rate pressure and rising inflation. Again, this differs from the response of many Latin American commodity exporters, who raised policy rates in order to keep inflation expectations anchored. Finally, many African economies have been less successful than other EMEs in shielding their banks from the fallout of lower commodity prices, sharp depreciation and feeble growth.

### **Long-term issues for central banks** **BIS Papers No 92, August 2017**

The 15th BIS Annual Conference took place in Lucerne, Switzerland, on 24 June 2016. The event brought together a distinguished group of central bank Governors, leading academics and former public officials to exchange views on the topic "Long-term issues for central banks". The papers presented at the conference and the discussants' comments are released as BIS Working Papers 653 to 656.

## BIS Working Papers

### **How important is the Global Financial Cycle? Evidence from capital flows** **Eugenio Cerutti, Stijn Claessens and Andrew K Rose** **August 2017, No 661**

This study quantifies the importance of a Global Financial Cycle (GFCy) for capital flows. We use capital flow data disaggregated by direction and type between Q1 1990 and Q4 2015 for 85 countries, and conventional techniques, models and metrics. Since the GFCy is an unobservable concept, we use two methods to represent it: directly observable variables in centre economies often linked to it, such as the VIX; and indirect manifestations, proxied by common dynamic factors extracted from actual capital flows. Our evidence seems mostly inconsistent with a significant and conspicuous GFCy; the two methods combined rarely explain more than a quarter of the variation in capital flows. Succinctly, most variation in capital flows does not seem to be the result of common shocks nor stem from observables in a central country like the United States.

<sup>1</sup> Requests for publications should be addressed to Bank for International Settlements, Press & Communications, Centralbahnplatz 2, CH-4002 Basel. These publications are also available on the BIS website (<http://www.bis.org/>).

### **Informal one-sided target zone model and the Swiss franc**

**Yu-Fu Chen, Michael Funke and Richhild Moessner**

**August 2017, No 660**

This paper develops a new theoretical model with an asymmetric informal one-sided exchange rate target zone, with an application to the Swiss franc following the removal of the minimum exchange rate of CHF 1.20 per euro in January 2015. We extend and generalize the standard target zone model of Krugman (1991) by introducing perceived uncertainty about the lower edge of the band. We find that informal soft edge target zone bands lead to weaker honeymoon effects, wider target zone ranges and higher exchange rate volatility than formal target zone bands. These results suggest that it would be beneficial for exchange rate policy intentions to be stated clearly in order to anchor exchange rate expectations and reduce exchange rate volatility. We also study how exchange rate dynamics can be characterized in models in which financial markets are aware of occasional changes in the policy regime. We show that expected changes in the central bank's exchange rate policy may lead to exchange rate oscillations, providing an additional source of exchange rate volatility, and to capture this it is important to take into account the possibility of regime changes in exchange rate policy.

### **Effects of capital controls on foreign exchange liquidity**

**Carlos Cantú**

**August 2017, No 659**

The literature on capital controls has focused on their use as tools to manage capital and improve macroeconomic and financial stability. However, there is a lack of analysis of their effect on foreign exchange (FX) market liquidity. In particular, technological and regulatory changes in FX markets over the past decade have had an influence on the effect of capital controls on alternative indicators of FX liquidity.

In this paper, we introduce a theoretical model showing that, if capital controls are modelled as entry costs, then fewer investors will enter an economy. This will reduce the market's ability to accommodate large order flows without a significant change in the exchange rate (a market depth measure of liquidity). On the other hand, if capital controls are modelled as transaction costs, they can reduce the effective spread (a cost-based measure of liquidity). Using a panel of 20 emerging market economies and a novel measure of capital account restrictiveness, we provide empirical evidence showing that capital controls can reduce cost-based measures of FX market liquidity. The results imply that capital controls are effective in reducing the implicit cost component of FX market liquidity but can also have a negative structural effect on the FX market by making it more vulnerable to order flow imbalances.

### **The Distance Effect in Banking and Trade**

**Michael Brei and Goetz von Peter**

**August 2017, No 658**

The empirical gravity literature finds geographical distance to be a large and growing obstacle to trade, contradicting the popular notion that globalization heralds "the end of geography". This distance puzzle disappears, however, when measuring the effect of cross-border distance relative to that of domestic distance (Yotov, 2012). We uncover the same result for banking when comparing cross-border positions with domestic credit, using the most extensive dataset on global bank linkages between countries. The role of distance remains substantial for trade as well as for banking where transport cost is immaterial - pointing to the role of information frictions as a common driver. A second contribution is to show that the forces of globalization are also evident in other, less prominent, parts of the gravity framework.

### **Quality Pricing-to-Market**

**Raphael Auer, Thomas Chaney and Philip Sauré**

**August 2017, No 657**

This paper analyses firm's pricing-to-market decisions in vertically differentiated industries. We first present a model featuring firms that sell goods of heterogeneous quality levels to consumers who are heterogeneous in their income and thus their marginal willingness to pay for quality increments. We derive closed-form solutions for the unique pricing game under

costly international trade. The comparative statics highlight how firms' pricing-to-market decisions are shaped by the interaction of consumer income and good quality. We derive two testable predictions. First, the relative price of high qualities compared to low qualities increases with the income of the destination market. Second, the rate of cost pass-through into consumer prices falls with quality if destination market income is sufficiently high. We present evidence in support of these two predictions based on a dataset of prices, sales, and product attributes in the European car industry.

### **Demographics will reverse three multi-decade global trends**

**Charles Goodhart and Manoj Pradhan**

**August 2017, No 656**

Between the 1980s and the 2000s, the largest ever positive labour supply shock occurred, resulting from demographic trends and from the inclusion of China and eastern Europe into the World Trade Organization. This led to a shift in manufacturing to Asia, especially China; a stagnation in real wages; a collapse in the power of private sector trade unions; increasing inequality within countries, but less inequality between countries; deflationary pressures; and falling interest rates. This shock is now reversing. As the world ages, real interest rates will rise, inflation and wage growth will pick up and inequality will fall. What is the biggest challenge to our thesis? The hardest prior trend to reverse will be that of low interest rates, which have resulted in a huge and persistent debt overhang, apart from some deleveraging in advanced economy banks. Future problems may now intensify as the demographic structure worsens, growth slows, and there is little stomach for major inflation. Are we in a trap where the debt overhang enforces continuing low interest rates, and those low interest rates encourage yet more debt finance? There is no silver bullet, but we recommend policy measures to switch from debt to equity finance.

### **The FinTech Opportunity**

**Thomas Philippon**

**August 2017, No 655**

This paper assesses the potential impact of FinTech on the finance industry. I document first that financial services remain surprisingly expensive, which explains the emergence of new entrants. I then argue that the current regulatory approach is subject to significant political economy and coordination costs, and therefore unlikely to deliver much structural change. FinTech can improve both financial stability and access to services, but this requires significant changes in the focus of regulations.

### **World changes in inequality: an overview of facts, causes, consequences and policies**

**François Bourguignon**

**August 2017, No 654**

This paper reviews various issues linked to the rise of inequality observed particularly in developed countries over the last quarter century. Various data on the time profile of inequality are examined, which do not always fit the common view that inequality is everywhere trending upwards. Overall, changes in inequality appear to be very country-specific. The same conclusion obtains when examining the causes of these changes. There is little doubt that common forces affected the distribution of income in most countries, but idiosyncratic factors have amplified their effects in some cases and offset them in others. Country-specificity also holds with regard to policies aimed at correcting inequality, even though globalisation imposes constraints on some key redistribution tools such as taxation and the regulation of financial markets. International coordination and, in particular, more transparency in cross-border financial operations are needed if governments are to recover some autonomy in these matters.

### **Dollar pricing redux**

**Camila Casas, Federico Díez, Gita Gopinath and Pierre-Olivier Gourinchas**

**August 2017, No 653**

A country's exchange rate is at the center of economic and political debates on currency wars and trade competitiveness. The real consequences of exchange rate fluctuations depend critically on how firms set prices in international markets. Recent empirical evidence has challenged the dominant 'producer currency' pricing and 'local currency' pricing paradigms in

the literature. In this paper we propose a new paradigm, consistent with the empirical evidence and characterized by three features: pricing in dollars, strategic complementarity in pricing and imported inputs in production. We call this the 'dollar pricing' paradigm and contrast its theoretical predictions with prior approaches in a general equilibrium New Keynesian model. We then employ novel data for Colombia to evaluate the implications of exchange rate fluctuations associated with commodity price shocks and show that the findings strongly support the dollar pricing paradigm.

### **The discontinuation of the EUR/CHF minimum exchange rate in January 2015: was it expected?**

**Michael Funke, Julius Loermann and Richhild Moessner**  
July 2017, No 652

We derive risk-neutral probability densities for future euro/Swiss franc exchange rates as implied by option prices. We find that the credibility of the Swiss franc floor somewhat decreased as the spot exchange rate approached the lower bound of 1.20 CHF per euro. We also compare the forecasting performance of a random walk benchmark model with an error-correction model (ECM) augmented with option-implied break probabilities of breaching the currency floor. We find some evidence that the augmented ECM has an informational advantage over the random walk when using one-month break probabilities. But we find that one-month option-implied densities cannot predict the entire range of exchange rate realizations.

### **Segmented money markets and covered interest parity arbitrage**

**Dagfinn Rime, Andreas Schrimpf and Olav Syrstad**  
July 2017, No 651

This paper studies the violation of the most basic no-arbitrage condition in international finance - Covered Interest Parity (CIP). To understand the CIP conundrum, it is key to (i) account for funding frictions in U.S. dollar money markets, and (ii) to study the challenges of swap intermediaries when funding liquidity evolves differently across major currency areas. We find that CIP holds remarkably well for most potential arbitrageurs when applying their marginal funding rates. With severe funding liquidity differences, however, it becomes impossible for dealers to quote prices such that CIP holds across the full rate spectrum. A narrow set of global top-tier banks enjoys risk-less arbitrage opportunities as dealers set quotes to avert order flow imbalances. We show how a situation with persistent arbitrage profits arises as an equilibrium outcome due to the constellation of market segmentation, the abundance of excess reserves and their remuneration in central banks' deposit facilities.

### **Financial deglobalisation in banking?**

**Robert Neil McCauley, Agustín S Bénétrix, Patrick McGuire and Goetz von Peter**  
June 2017, No 650

This paper argues that the decline in cross-border banking since 2007 does not amount to a broad-based retreat in international lending ("financial deglobalisation"). We show that BIS international banking data organised by the nationality of ownership ("consolidated view") provide a clearer picture of international financial integration than the traditional balance-of-payments measure. On the consolidated view, what appears to be a global shrinkage of international banking is confined to European banks, which uniquely responded to credit losses after 2007 by shedding assets abroad - in particular, reducing lending - to restore capital ratios. Other banking systems' global footprint, notably those of Japanese, Canadian and even US banks, has expanded since 2007. Using a global dataset of banks' affiliates (branches and subsidiaries), we demonstrate that the who (nationality) accounts for more of the peak-to-trough shrinkage of foreign claims than does the where (locational factors). These findings suggest that the contraction in global lending can be interpreted as cyclical deleveraging of European banks' large overseas operations, rather than broad-based financial deglobalisation.

## **Monetary policy transmission and trade-offs in the United States: Old and new**

**Boris Hofmann and Gert Peersman**

**June 2017, No 649**

This study shows that, in the United States, the effects of monetary policy on credit and housing markets have become considerably stronger relative to the impact on GDP since the mid-1980s, while the effects on inflation have become weaker. Macroeconomic stabilization through monetary policy may therefore have become associated with greater fluctuations in credit and housing markets, whereas stabilizing credit and house prices may have become less costly in terms of macroeconomic volatility. These changes in the aggregate impact of monetary policy can be explained by several important changes in the monetary transmission mechanism and in the composition of macroeconomic and credit aggregates. In particular, the stronger impact of monetary policy on credit is driven by a much higher responsiveness of mortgage credit and a larger share of mortgages in total credit since the 1980s.

## **Credit ratings of domestic and global agencies: What drives the differences in China and how are they priced?**

**Xianfeng Jiang and Frank Packer**

**June 2017, No 648**

The market for the credit ratings of Chinese firms is large and growing. We focus our analysis on the firms that have ratings from both domestic and global agencies. Despite the similar symbols, the rating scales of the domestic and global agencies differ: domestic agencies rate firms that are jointly rated higher than global agencies by 6-7 notches on average. Focusing on the rank order of domestic and global credit ratings, we test for differences in the determinants of ratings across global and domestic agencies. We find asset size is weighed more heavily as a positive factor by domestic agencies, and leverage is weighed more heavily as a negative factor by global agencies. Profitability and state-ownership are weighed more positively by global rating agencies. The influence of the variables is generally stable across a variety of robustness checks. In spite of these differences, both domestic and global ratings appear to be priced into the market values of rated bonds.

## **The evolution of inflation expectations in Japan**

**Masazumi Hattori and James Yetman**

**June 2017, No 647**

We model inflation forecasts as monotonically diverging from an estimated long-run anchor point towards actual inflation as the forecast horizon shortens. Fitting the model with forecaster-level data for Japan, we find that the estimated anchors across forecasters have tended to rise in recent years, along with the dispersion in estimates across forecasters. Further, the degree to which these anchors pin down inflation expectations at longer horizons has increased, but remains considerably lower than found in a similar study of Canadian and US forecasters. Finally, the wide dispersion in estimated decay paths across forecasters points to a diverse set of views across forecasters about the inflation process in Japan.

## **Macroprudential policy and bank risk**

**Yener Altunbas, Mahir Binici and Leonardo Gambacorta**

**June 2017, No 646**

This paper investigates the effects of macroprudential policies on bank risk through a large panel of banks operating in 61 advanced and emerging market economies. There are three main findings. First, there is evidence suggesting that macroprudential tools have a significant impact on bank risk. Second, the responses to changes in macroprudential tools differ among banks, depending on their specific balance sheet characteristics. In particular, banks that are small, weakly capitalised and with a higher share of wholesale funding react more strongly to changes in macroprudential tools. Third, controlling for bank-specific characteristics, macroprudential policies are more effective in a tightening than in an easing episode.

### **Accounting for debt service: the painful legacy of credit booms**

**Mathias Drehmann, Mikael Juselius and Anton Korinek**

**June 2017, No 645**

When taking on new debt, borrowers commit to a pre-specified path of future debt service. This implies a predictable lag between credit booms and peaks in debt service which, in a panel of household debt in 17 countries, is four years on average. The lag is driven by two key features of the data: (i) new borrowing is strongly auto-correlated and (ii) debt contracts are long term. The delayed increase in debt service following an impulse to new borrowing largely explains why credit booms are associated with lower future output growth and higher probability of crisis. This provides a systematic transmission channel whereby credit expansions can have long-lasting adverse real effects.

### **The shifting drivers of global liquidity**

**Stefan Avdjiev, Leonardo Gambacorta, Linda Goldberg and Stefano Schiaffi**

**June 2017, No 644**

The post-crisis period has seen a considerable shift in the composition and drivers of international bank lending and international bond issuance, the two main components of global liquidity. The sensitivity of both types of flow to US monetary policy rose substantially in the immediate aftermath of the Global Financial Crisis, peaked around the time of the 2013 Fed "taper tantrum", and then partially reverted towards pre-crisis levels. Conversely, the responsiveness of international bank lending to global risk conditions declined considerably post-crisis and became similar to that of international debt securities. The increased sensitivity of international bank flows to US monetary policy has been driven mainly by post-crisis changes in the behaviour of national lending banking systems, especially those that ex ante had less well capitalized banks. By contrast, the post-crisis fall in the sensitivity of international bank lending to global risk was mainly due to a compositional effect, driven by increases in the lending market shares of better-capitalized national banking systems. The post-2013 reversal in the sensitivities to US monetary policy partially reflects the expected divergence of the monetary policy of the US and other advanced economies, highlighting the sensitivity of capital flows to the degree of commonality of cycles and the stance of policy. Moreover, global liquidity fluctuations have largely been driven by policy initiatives in creditor countries. Policies and prudential instruments that reinforced lending banks' capitalization and stable funding levels reduced the volatility of international lending flows.

### **The international dimensions of macroprudential policies**

**Pierre-Richard Agénor, Enisse Kharroubi, Leonardo Gambacorta, Giovanni Lombardo and Luiz Awazu Pereira da Silva**

**June 2017, No 643**

The large economic costs associated with the Global Financial Crisis have generated renewed interest in macroprudential policies and their international coordination. Based on a core-periphery model that emphasizes the role of international financial centers, we study the effects of coordinated and non-coordinated macroprudential policies when financial intermediation is subject to frictions. We find that even when the only frictions in the economy consist of financial frictions and financial dependency of periphery banks, the policy prescriptions under international policy coordination can differ quite markedly from those emerging from self-oriented policy decisions. Optimal macroprudential policies must address both short run and long run inefficiencies. In the short run, the policy instruments need to be adjusted to mitigate the adverse consequences of the financial accelerator, and its cross-country spillovers. In the long run, policymakers need to take into account the effects of the higher cost of capital, due to the presence of financial frictions. The gains from cooperation appear to be sizable. Nevertheless, their magnitude could be asymmetric, pointing to potential political-economy obstacles to the implementation of cooperative measures.

### **The effects of monetary policy shocks on inequality in Japan**

**Masayuki Inui, Nao Sudo and Tomoaki Yamada**

**June 2017, No 642**

The impacts of monetary easing on inequality have been attracting increasing attention recently. In this paper, we use the micro-level data on Japanese households to study the

distributional effects of monetary policy. We construct quarterly series of income and consumption inequality measures from 1981 to 2008, and estimate their response to a monetary policy shock. We find that monetary policy shocks do not have a statistically significant impact on inequality across Japanese households in a stable manner. When considering inequality across households whose head is employed, we find evidence that, before the 2000s, an expansionary monetary policy shock increased income inequality through a rise in earnings inequality. Such procyclical responses are, however, scarcely observed when the current data are included in the sample period, or when earnings inequality across all households is considered. We also find that transmission of income inequality to consumption inequality is minor, including during the period when procyclicality of income inequality was pronounced. Using a two-sector dynamic general equilibrium model with attached labor inputs, we show that labor market flexibility is central to the dynamics of income inequality after monetary policy shocks. We also use the micro-level data on households' balance sheets and show that distributions of households' financial assets and liabilities do not play a significant role in the distributional effects of monetary policy.

### **China's evolving monetary policy rule: from inflation-accommodating to anti-inflation policy**

**Eric Girardin, Sandrine Lunven and Guonan Ma**

**June 2017, No 641**

This paper aims to enhance the understanding of China's monetary policy rule since the mid-1990s, focusing on the role of inflation. It investigates the rule followed by the People's Bank of China (PBoC) by considering both the structural economic transformation of China and its evolving monetary policy framework.

Our newly constructed monthly composite discrete monetary policy index (MPI), which combines price, quantity and administrative instruments, shows a change in style towards smoother but more contractionary policy moves from 2002 onwards. The estimation of a dynamic discrete-choice model à la Monokroussos (2011) implies that, from this point onwards, the conduct of monetary policy has been characterised by implicit inflation targeting. While the PBoC's behaviour up to 2001 was reminiscent of that in the inflation-accommodating G3 economies of the United States, euro area and Japan up to 1979, it has been characterized since 2002 by a policy rule similar to the post-1979 anti-inflation (forward-looking) policy of the G3. An accurate estimation of the monetary policy rule from 2002 needs to consider China as an open economy, as a result of its rapid liberalisation of trade and finance after its WTO accession. As such, the influence of US interest rates has become increasingly significant for Chinese monetary policy.

## **Basel Committee on Banking Supervision**

### **Implications of fintech developments for banks and bank supervisors - consultative document**

**August 2017**

The Basel Committee on Banking Supervision today released a consultative document on the implications of fintech for the financial sector. Sound practices: Implications of fintech developments for banks and bank supervisors • assesses how technology-driven innovation in financial services, or "fintech", may affect the banking industry and the activities of supervisors in the near to medium term.

Various future potential scenarios are considered, with their specific risks and opportunities. In addition to the banking industry scenarios, three case studies focus on technology developments (big data, distributed ledger technology, and cloud computing) and three on fintech business models (innovative payment services, lending platforms and neo-banks).

Although fintech is only the latest wave of innovation to affect the banking industry, the rapid adoption of enabling technologies and emergence of new business models pose an increasing challenge to incumbent banks in almost all the scenarios considered.

Banking standards and supervisory expectations should be adaptive to new innovations, while maintaining appropriate prudential standards. Against this background, the Committee has identified 10 key observations and related recommendations on the following supervisory issues for consideration by banks and bank supervisors:

1. the overarching need to ensure safety and soundness and high compliance standards without inhibiting beneficial innovation in the banking sector;
2. the key risks for banks related to fintech developments, including strategic/profitability risks, operational, cyber and compliance risks;
3. the implications for banks of the use of innovative enabling technologies;
4. the implications for banks of the growing use of third parties, via outsourcing and/or partnerships;
5. cross-sectoral cooperation between supervisors and other relevant authorities;
6. international cooperation between banking supervisors;
7. adaptation of the supervisory skillset;
8. potential opportunities for supervisors to use innovative technologies ("suptech");
9. relevance of existing regulatory frameworks for new innovative business models; and
10. key features of regulatory initiatives set up to facilitate fintech innovation.

The Committee welcomes comments on all aspects of this consultative document. Comments should be uploaded by Tuesday 31 October 2017 via the following BCBS link. All comments will be published on the website of the Bank for International Settlements unless a respondent specifically requests confidential treatment.

### **The interplay of accounting and regulation and its impact on bank behaviour July 2017**

Accounting rules and disclosure standards are important determinants for banks' incentives and behaviour, and the recent financial crisis, where criticism was voiced (eg regarding the role of fair value accounting of financial assets and incurred loss provisioning of loans), is just another example of the importance and relevance of banks' financial reporting in a regulatory and supervisory context.

In March 2013, the Basel Committee's Research Task Force initiated a work stream that deals with aspects of the interplay of accounting and regulation and its impact on bank behaviour from a research perspective. Specifically, the work stream was tasked to "identify ways in which the interaction between accounting and regulatory rules provides incentives that affect the risk taking of financial institutions", and it commenced research on specific aspects of loan loss provisioning, disclosure rules, fair value accounting, and prudential filters.

In summary, the results described in this report as well as the conclusions from other studies reported in Basel Committee working paper 28 suggest that both in the context of loan loss provisioning and the valuation of banks' assets, there is a tension between backward-looking and forward-looking measurement. This observation is also consistent with the mixed picture that is given by the analytical results regarding several research questions. One conclusion is that corner solutions in one or the other direction do not seem optimal, and that an adequate mix of the two concepts may be superior. The other conclusion is that further evidence on the research questions posed is clearly needed. For example, all projects of the work stream focus on quantities, but not on prices of financial instruments (eg loan rates or yields of securities). Therefore, researchers are encouraged to further address the interplay of accounting and regulation and its impact on bank behaviour from an academic perspective.

## **Criteria for identifying simple, transparent and comparable short-term securitisations - consultative document**

**July 2017**

The Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) today released the consultative document *Criteria for identifying simple, transparent and comparable short-term securitisations* (the short-term STC criteria).

The short-term STC criteria maintain and build on the principles in the *Criteria for identifying simple, transparent and comparable securitisations* issued by BCBS-IOSCO in July 2015. The criteria published today take account of the characteristics of asset-backed commercial paper (ABCP) conduits, such as (i) the short maturity of the commercial paper issued, (ii) the different forms of programme structures and (iii) the existence of multiple forms of liquidity and credit support facilities.

The criteria aim to assist the financial industry in its development of simple, transparent and comparable short-term securitisations. They were designed to help the parties to such transactions to evaluate the risks of a particular securitisation across similar products and to assist investors with their conduct of due diligence on securitisations. The BCBS has concurrently issued a consultative document *Capital treatment for simple, transparent and comparable short-term securitisations* outlining how the short-term STC criteria could be incorporated into the regulatory capital framework for banks.

BCBS and IOSCO welcome comments on all aspects of this consultative document. Comments on the proposals should be provided by Thursday 5 October 2017, via upload through the following BCBS link, or by e-mail to [IOSCO\\_consultation-03-2017@iosco.org](mailto:IOSCO_consultation-03-2017@iosco.org). All comments will be published on the websites of the Bank for International Settlements and IOSCO unless a respondent specifically requests confidential treatment.

## **Capital treatment for simple, transparent and comparable short-term securitisations - consultative document**

**July 2017**

The Basel Committee on Banking Supervision today released the consultative document *Capital treatment for simple, transparent and comparable short-term securitisations*. The Committee's proposed capital treatment supplements the consultative document *Criteria for identifying simple, transparent and comparable short-term securitisations* issued jointly with the International Organization of Securities Commissions (IOSCO).

The consultative document sets out additional guidance and requirements for the purpose of applying preferential regulatory capital treatment for banks acting as investors in or as sponsors of simple, transparent and comparable (STC) short-term securitisations, typically in asset-backed commercial paper (ABCP) structures. The additional guidance and requirements include that:

investors have access to key monthly information on the performance and key characteristics of the ABCP structure;

the redemption risk of the underlying assets is addressed from the sponsor's perspective; and

the transactions funded by the conduit have an enforceable legal structure and that the relevant information is disclosed by the sponsor to investors.

The proposed treatment is also consistent with the Committee's July 2016 revisions to the securitisation framework. The 2016 standard sets out additional guidance and requirements for differentiating the capital treatment of STC term securitisations from that of other securitisations. Similarly, provided that the proposed criteria are met, STC short-term securitisations will receive the same reduction in capital requirements as other STC term securitisations. This enhances the framework's risk sensitivity without significantly increasing banks' operational burden in computing the applicable capital relief.

The Committee welcomes comments on all aspects of this consultative document. Comments should be uploaded by Thursday 5 October 2017 using the following BCBS link. All comments will be published on the website of the Bank for International Settlements unless a respondent specifically requests confidential treatment.

### **Implementation of Basel standards**

**July 2017**

Full, timely and consistent implementation of Basel III remains fundamental to building a resilient financial system, maintaining public confidence in regulatory ratios and providing a level playing field for internationally active banks. This report • updates G20 Leaders on progress and challenges in the implementation of the Basel III regulatory reforms since August 2016, when the Basel Committee last reported to the G20.

The report summarises the steps taken by Basel Committee member jurisdictions to adopt the Basel III standards, banks' progress in bolstering their capital and liquidity positions, the consistency of implementation in jurisdictions assessed since the Committee's last report and the Committee's implementation work plan.

### **Regulatory Consistency Assessment Programme (RCAP) - Assessment of Basel III LCR regulations – China**

**July 2017**

In China, the LCR applies to all commercial banks with total assets of at least 200 billion Chinese renminbi (CNY). It was implemented via three regulations on reporting, minimum LCR requirements and disclosure. These were issued in December 2013, February 2014 and December 2015, respectively, and came into effect in January 2014, March 2014 and December 2015.

Overall, as of 31 March 2017, the LCR regulations in China are assessed as compliant with the Basel LCR standards. This is the highest possible grade. All four components are also assessed as compliant, with no gaps identified between the Basel LCR standards and the Chinese regulations. The Assessment Team compliments the CBRC on its implementation of an alignment with the Basel LCR framework.

In some respects, the Chinese LCR framework is stricter than the Basel standards, particularly with respect to the definition of high-quality liquid assets (HQLA).

In addition to the formal assessment of the LCR standard and disclosure requirements, this report contains annexes that summarise China's implementation of the LCR monitoring tools and the Basel Committee's principles for sound liquidity risk management, as well as the key national discretions and approaches that the CBRC has adopted when implementing the LCR. These annexes show how national authorities implement certain aspects of the Basel standards that are not in scope of the formal RCAP-LCR assessment. Over time, this information will provide a basis for designing sound practices and additional supervisory guidance that will benefit the regulatory community and the banking industry. This should raise the consistency of LCR implementation and improve the ratio's effectiveness in practice.

### **Regulatory Consistency Assessment Programme (RCAP) - Assessment of Basel III LCR regulations - European Union**

**July 2017**

This report presents the findings of the RCAP Assessment Team on the adoption of the Basel Liquidity Coverage Ratio (LCR) in the European Union (EU) and its consistency with the minimum requirements of the Basel III framework. The assessment is based on the EU LCR rules of the Capital Requirements Regulation (CRR) and the Fourth Capital Requirements Directive (CRD IV), supplemented by the Commission Delegated Act 2015/61 and the European Banking Authority (EBA) standards and guidelines in force as of 31 March 2017. The assessment was limited to the delegation of these directives and regulations to the nine Member States of the EU whose central banks and/or prudential supervisory agencies are Basel Committee members (Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Spain, Sweden and the United Kingdom ("the nine Member States")).<sup>1</sup>

The RCAP Assessment Team was led by Mr Rob Urry, Deputy Registrar of Banks, Bank Supervision Department of South African Reserve Bank (SARB). The Assessment Team comprised two technical experts, drawn from Australia and Indonesia (Annex 1). The main counterpart for the assessment was the European Commission (EC), which in turn coordinated with other EU and Member States' authorities. The overall work was coordinated by the Basel Committee Secretariat with support from SARB staff.

The assessment focuses on the consistency and completeness of the EU LCR rules with the Basel minimum requirements. Issues relating to prudential outcomes, the liquidity position of individual banks or the effectiveness of the EU authorities' supervisory effectiveness were not in the scope of this RCAP assessment. The assessment relied upon the EU regulations and other information and explanations provided by the EC and EBA and ultimately reflects the expert view of the Assessment Team on the documents and data reviewed. Where deviations from the Basel framework were identified, they were evaluated for their current and potential impact on the reported LCR for a sample of internationally active banks in the nine Member States. The materiality assessment relied upon the data, information and computations provided by the EBA. Some findings were evaluated on a qualitative basis in instances where appropriate quantitative data were not available. The overall assessment outcome was then based on the materiality of findings (in both quantitative and qualitative terms) and expert judgment. The Assessment Team followed the methodology and guidance provided in the RCAP Handbook for Jurisdictional Assessments.

**Regulatory Consistency Assessment Programme (RCAP) - Assessment of Basel III LCR regulations - United States of America**  
**July 2017**

This report presents the findings of an RCAP assessment on the domestic adoption of the Basel Liquidity Coverage Ratio (LCR) standard in the United States (US) and its consistency with the minimum requirements of the Basel III framework.

The focus of the assessment was on the consistency and completeness of US regulations with the Basel minimum requirements, with respect to the regulations applied to those US banks that are internationally active and of significance to domestic financial stability. Issues relating to prudential outcomes, the liquidity position of individual banks or the US authorities' supervisory effectiveness were not within the scope of this RCAP assessment. The assessment relied upon data, information and materiality computations provided by the US authorities and was based on US regulations in force as of 31 December 2016. The Basel Committee discussed and approved the report, which ultimately reflects its judgment on the consistency and completeness of the US implementation of the LCR.

The assessment began in April 2016 and consisted of three phases: (i) completion of an RCAP questionnaire (a self-assessment) by the US authorities; (ii) an assessment phase (July to December 2016); and (iii) a post-assessment review phase (January to June 2017). The second phase included an evaluation of the self-assessment provided by the US authorities as well as an on-site assessment, which involved discussions with US authorities and representatives of US banks. These exchanges provided the Assessment Team with a deeper understanding of the implementation of the Basel LCR in the US. The third phase consisted of a two-stage technical review of the assessment findings: first, by a separate RCAP Review Team and feedback from the Basel Committee's Supervision and Implementation Group (SIG); and second, by the RCAP Peer Review Board and the Basel Committee. This two-step review process is a key part of the RCAP process, providing quality control and ensuring integrity of the assessment findings. The Assessment Team prepared a draft report based on (i) its assessment and discussions with the US authorities and (ii) discussions of the report by the Committee's Supervision and Implementation Group (SIG). This report was later updated by the Basel Committee's Secretariat to reflect the views of the Peer Review Board and, ultimately, of the Basel Committee.

**Simplified alternative to the standardised approach to market risk capital requirements  
- consultative document  
June 2017**

In January 2016, the Basel Committee on Banking Supervision published the standard Minimum capital requirements for market risk. The standard includes an internal models approach and a standardised approach to measuring market risk capital requirements.

In order to facilitate adoption of this standard for banks other than those that are large and internationally active, this document sets out the Committee's proposal for a simplified alternative to the market risk standardised approach. The proposed reduced sensitivities-based method represents a simplified version of the sensitivities-based method (SbM), which is the primary component of the standardised approach. Significant simplifications relative to the SbM include:

- removal of capital requirements for vega and curvature risks

- simplification of the basis risk calculation

- reduction in risk factor granularity and the correlation scenarios to be applied in the associated calculations

Use of the proposed reduced SbM would be subject to supervisory approval and oversight, and would be available only to banks that meet certain qualitative and quantitative criteria. As proposed, for banks that adopt the reduced SbM, the standardised approach market risk capital requirement would be the sum of three components: (i) the risk charges under the reduced SbM (as proposed in the consultative document); (ii) the default risk charge; and (iii) the residual risk add-on, with the latter two to be calculated as specified in the January 2016 standard.

As an alternative, the Committee also seeks feedback on whether retaining a recalibrated version of the Basel II standardised approach to market risk would better serve the purpose of including a simplified method for market risk capital requirements in the Basel framework.

The Committee welcomes comments on all aspects of this consultative document and the proposed standards text. Comments on the proposals should be uploaded here by Wednesday 27 September 2017. All comments will be published on the website of the Bank for International Settlements unless a respondent specifically requests confidential treatment.

**Range of practices in implementing the countercyclical capital buffer policy  
June 2017**

The Basel Committee on Banking Supervision introduced the countercyclical capital buffer (CCyB) policy as part of the Basel III reforms. The countercyclical capital buffer aims to ensure that banking sector capital requirements take account of the macro-financial environment in which banks operate. Its primary objective is to use a buffer of capital to achieve the broader macroprudential goal of protecting the banking sector from periods of excess aggregate credit growth that have often been associated with the build-up of system-wide risk.

In 2010, the Committee issued the Guidance for national authorities operating the countercyclical capital buffer. While this document provides key requirements for CCyB policies that national authorities should follow in designing their CCyB framework and making buffer decisions, national authorities retain considerable flexibility to design the particular details of their policies in a manner that best reflects specific national circumstances.

The document on Range of practices in implementing the countercyclical capital buffer policy examines how jurisdictions have used this flexibility in designing their CCyB policies, drawing on information from a survey undertaken by the Committee as well as the website of CCyB decisions maintained by the Committee. It details the various national CCyB policy frameworks and operational aspects, underlining the varying discretionary elements of jurisdictions' CCyB policy frameworks and practices.

This document also highlights the importance of implementing the Basel standards and provides information on implementation practices related to CCyB policies. In particular, this document provides evidence that CCyB policy frameworks differ markedly with respect to:

their governance structures;

the number of indicators used to identify periods of excess credit and systemic risk;

the degree of reliance on formal versus judgmental approaches in making CCyB decisions; and

their communication and reciprocity practices.

Furthermore, the final section of the report outlines some issues that were identified in the context of the cross-jurisdiction comparisons, which could be further discussed over the medium term as experience with the CCyB policy is gained.

### **Basel III - The Liquidity Coverage Ratio: frequently asked questions June 2017**

The Basel Committee on Banking Supervision today issued a second set of frequently asked questions (FAQs) and answers on Basel III's Liquidity Coverage Ratio (LCR). This new set of FAQs are grouped according to the paragraph number of the related issue within the LCR framework and have been combined with existing FAQs published in April 2014.

To promote consistent global implementation of these requirements, the Committee periodically reviews frequently asked questions and publishes answers along with any necessary technical elaboration of the rules text and interpretative guidance. The Committee has received a number of interpretation questions related to the January 2013 publication of the LCR standard.

### **Sound management of risks related to money laundering and financing of terrorism: revisions to correspondent banking annex - final document June 2017**

The Basel Committee on Banking Supervision has finalised its revisions to the annex on correspondent banking.

These revisions are included in a new release of the guidelines on the Sound management of risks related to money laundering and financing of terrorism • , which was first published in January 2014, with a first revised version issued in February 2016.

The revisions are consistent with the Financial Action Task Force (FATF) guidance on Correspondent banking services issued in October 2016 and serve the same objective of clarifying rules applicable to banks conducting correspondent banking activities. They form part of a broader initiative of the international community to assess and address the decline in correspondent banking coordinated by the Financial Stability Board • .

The text includes proposed revisions to annexes 2 (Correspondent banking) and 4 (General guide to account opening) of the Basel Committee's guidelines on the Sound management of risks related to money laundering and financing of terrorism. The revisions guide the banks in the application of the risk-based approach for correspondent banking relationships, recognising that not all correspondent banking relationships bear the same level of risk and including an updated list of risk indicators that correspondent banks should consider in their risk assessment.

A consultative version - Revisions to the annex on correspondent banking - was issued in November 2016. The Basel Committee wishes to thank all those who took the trouble to express their views during the consultation process.

## Committee on Payments and Market Infrastructures

### **Methodology of the statistics on payments and financial market infrastructures in the CPMI countries (Red Book statistics)**

**May 2017 No 168**

Under the guidance of the Committee on Payments and Market Infrastructures (CPMI) and in cooperation with central banks in CPMI jurisdictions, the BIS compiles statistics on payments and financial market infrastructures, the so-called Red Book statistics.

The CPMI today published a revised methodology of the Red Book statistics, which updates and enhances indicators on cashless payments and financial market infrastructures to reflect the substantial changes that the payment landscape has undergone over the past decade. The Red Book statistics will in future include more information on the role of non-banks, on online and contactless payments and on fast payments. The revised methodology also clarifies how to count debit and credit cards, and which retail cashless payments count as domestic and which as cross-border.

The revised methodology replaces that which has hitherto been appended to each annual Red Book PDF publication. It is complemented by an outline of the new structure of the statistical tables, which illustrates the relationship between indicators by means of numerical examples.

The 2017 Red Book (reporting end-2016 data, to be published in September and December 2017) will still use the old methodology. The new Red Book statistics will be published in a new user-friendly internet-based format.

### **Implementation monitoring of PFMI: Level 2 assessment report for Singapore**

**July 2017 No 167**

The Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) continue to closely monitor the implementation of the Principles for financial market infrastructures (PFMI). The principles within the PFMI (the Principles) set expectations for the design and operation of key financial market infrastructures (FMIs) to enhance their safety and efficiency, and, more broadly, to limit systemic risk and foster transparency and financial stability. The Principles apply to all systemically important payment systems (PSs), central securities depositories (CSDs), securities settlement systems (SSSs), central counterparties (CCPs) and trade repositories (TRs) (collectively FMIs). These FMIs collectively clear, settle and record transactions in financial markets. In line with the G20's expectations, CPMI and IOSCO members have committed themselves to implementing and applying the PFMI in their respective jurisdictions.

This report presents the conclusions drawn by the CPMI and IOSCO from a Level 2 assessment of whether, and to what degree, the legal, regulatory and oversight frameworks, including rules and regulations, any relevant policy statements, or other forms of implementation applied to systemically important PSs, CSDs/SSSs, CCPs and TRs in Singapore, are complete and consistent with the Principles.

The work on the Level 2 assessment was carried out as a peer review from August 2016 to May 2017. The assessment reflects the status of Singapore's legal, regulatory and oversight framework as of 15 July 2016. Accordingly, assessment ratings reflect the implementation measures in place as of 15 July; other measures that were introduced after this date, or other material developments, are noted where relevant but were not considered in assigning ratings of consistency.

The Monetary Authority of Singapore (MAS) is the sole authority responsible for regulation, supervision and oversight of FMIs in Singapore.

The assessment found that Singapore has consistently adopted all but one of the Principles across FMI types. For PSs, CSDs/SSSs and CCPs, all the Principles have been implemented in a complete and consistent manner. For TRs, all the Principles, except for Principle 24 (disclosure

of market data by trade repositories), have been implemented in a complete and consistent manner. Some gaps were observed between the regulatory framework in Singapore and Principle 24. It is acknowledged that MAS is actively considering appropriate requirements for TRs to publish the data in a manner that will help to achieve the objectives of the public disclosure.

**Implementation monitoring of PFMI: Fourth update to Level 1 assessment report  
July 2017 No 166**

The Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) continue to closely monitor the implementation of the Principles for financial market infrastructures (PFMI). The PFMI are international standards for payment, clearing and settlement systems, and trade repositories. They are designed to ensure that the infrastructure supporting global financial markets is robust and well placed to withstand financial shocks.

This report provides jurisdictions' updated self-assessments of their progress towards adopting the legislation, regulations and other policies that will enable them to implement the 24 Principles for FMIs and four of the five Responsibilities for authorities included in the PFMI. It shows that progress continues to be made by the 28 participating jurisdictions since the previous update in June 2016. The next update of the Level 1 assessment will be conducted in 2018.

**Chairs' Report on the Implementation of the Joint Workplan for Strengthening the Resilience, Recovery and Resolvability of Central Counterparties  
July 2017 No 165**

This report describes how the 2015 workplan to strengthen the resilience, recovery and resolvability of central counterparties (CCPs) has been implemented. It was produced by the Chairs of the FSB Standing Committee on Supervisory and Regulatory Cooperation (Norman Chan), the FSB Resolution Steering Group (Elke König), the Committee on Payments and Market Infrastructures (Benoît Coeuré), the International Organization of Securities Commissions (Ashley Alder), and the Basel Committee on Banking Supervision (Stefan Ingves).

The report highlights the various guidance and reports published under the workplan, the establishment of crisis management groups (CMGs) for CCPs that are systemically important in more than one jurisdiction ('SI>1') and sets out actions in the next phase, which include:

- the continued monitoring of implementation of the principles in the Principles for Financial Market Infrastructures regarding resilience and recovery of CCPs, and finalisation of the framework on supervisory stress testing for CCPs;

- the implementation of the FSB Key Attributes of Effective Resolution Regimes for Financial Institutions consistent with the expectations regarding CCP resolution and resolution planning expanded upon in the FSB guidance, supported by (i) the establishment of CMGs for CCPs that are SI>1, including the home jurisdiction, and adoption of cooperation agreements; and (ii) further work on financial resources to support resolution and on the treatment of CCP equity in resolution;

- additional analysis of central clearing interdependencies to assess whether the key findings are stable over time; and

- further work to assess incentives to clear centrally arising from the interaction of post-crisis reforms.

**Analysis of Central Clearing Interdependencies  
July 2017 No 164**

The Committee on Payments and Market Infrastructures (CPMI), the Financial Stability Board (FSB), the International Organization of Securities Commissioners (IOSCO) and the Basel Committee on Banking Supervision (BCBS) today published a study on interdependencies in central clearing.

The network relationships analysed in this report are generally characterised by a core of highly connected central counterparties (CCPs) and financial institutions and a periphery of less highly connected CCPs and financial institutions. Financial resources provided to CCPs are concentrated at a small number of CCPs and exposures to CCPs are concentrated among a small number of institutions.

The study is one of the key substantive priorities set out in the joint workplan on CCP resilience, recovery and resolvability, along with the CPMI-IOSCO CCP resilience guidance, the CPMI-IOSCO CCP recovery guidance and the FSB CCP resolution guidance.

**Resilience of central counterparties (CCPs): Further guidance on the PFMI - Final report July 2017 No 163**

CCPs have become increasingly critical components of the financial system in recent years, due in part to the introduction of mandatory central clearing for standardised over-the-counter derivatives in some jurisdictions. It is, therefore, vital that each CCP is sufficiently resilient to withstand clearing member failures and other stress events.

The final report on Resilience of central counterparties (CCPs): Further guidance on the PFMI aims to improve the resilience of CCPs by providing guidance on the principles and key considerations in the Principles for Financial Market Infrastructures (PFMI) regarding financial risk management for CCPs. The report focuses on five key aspects of a CCP's financial risk management framework: governance, stress testing for both credit and liquidity exposures, coverage, margin, and a CCP's contribution of its financial resources to losses. The guidance should be understood in the context of the principles-based approach reflected in the PFMI, which recognises CCPs' differing organisations, functions and designs, and the different ways to achieve a particular result.

The guidance is not intended to impose additional standards for CCPs beyond those set out in the PFMI. However, CCPs may need to make changes to their rules, procedures, governance arrangements and risk management frameworks in order for practices to be consistent with the guidance. Relevant authorities may also determine that it is necessary to make changes to their regulatory frameworks. CCPs should promptly identify any areas where changes are necessary, and address them as soon as practicable, so that implementation of the necessary changes is completed no later than the end of 2017.

**Recovery of financial market infrastructures - Revised report July 2017 No 162**

CPMI and IOSCO have published further guidance on the principles and key considerations in the Principles for Financial Market Infrastructures (PFMI) that relate to recovery planning. This further guidance revises the 2014 recovery report, and is intended to further strengthen recovery arrangements for financial market infrastructures.

Compared to the 2014 recovery report, the revised guidance provides additional clarifications in four areas: (i) operationalisation of the recovery plan; (ii) replenishment; (iii) non-default related losses; and (iv) transparency with respect to recovery tools and how they would be applied.

A track-change version of the revised report showing changes from the 2014 recovery report is available upon request by contacting [cpmi@bis.org](mailto:cpmi@bis.org).

**Framework for supervisory stress testing of central counterparties (CCPs) - consultative report July 2017 No 161**

In April 2015, the G20 finance ministers and central bank governors asked the Financial Stability Board to work with the CPMI, IOSCO, and the Basel Committee on Banking Supervision to develop and report back on a workplan for identifying and addressing any gaps and potential financial stability risks relating to CCPs that are systemic across multiple jurisdictions and for helping to enhance their resolvability. This consultative report, Framework for supervisory stress testing of central counterparties (CCPs) • , published today by the CPMI and IOSCO addresses one aspect of this joint CCP Workplan.

The supervisory stress testing framework is designed to support tests conducted by one or more authorities that examine the potential macro-level impact of a common stress event affecting multiple CCPs. Among other things, such supervisory stress tests could help authorities better understand the scope and magnitude of the interdependencies between markets, CCPs and other entities such as participants, liquidity providers and custodians.

Published with this report is a cover note listing some of the specific issues on which the CPMI and IOSCO are soliciting input. Comments should be submitted by Friday, 22 September 2017 via e-mail to both the CPMI Secretariat and the IOSCO Secretariat.

**Harmonisation of critical OTC derivatives data elements (other than UTI and UPI) - third batch, consultative report  
July 2017 No 160**

G20 Leaders agreed in 2009 that all over-the-counter (OTC) derivatives contracts should be reported to trade repositories (TRs) as part of their commitment to reforming OTC derivatives markets with the aim of improving transparency, mitigating systemic risk and preventing market abuse. Aggregation of the data reported across TRs will help ensure that authorities can obtain a comprehensive view of the OTC derivatives market and its activity.

Following the 2014 FSB Feasibility study on approaches to aggregate OTC derivatives data, the FSB asked the CPMI and IOSCO to develop global guidance on the harmonisation of data elements reported to TRs and important for the aggregation of data by authorities, including Unique Transaction Identifier (UTI) and Unique Product Identifier (UPI).

This consultative report is part of the Harmonisation Group's response to that mandate. It complements the consultative report on Harmonisation of key OTC derivatives data elements (other than UTI and UPI) - first batch, on Harmonisation of critical OTC derivatives data elements (other than UTI and UPI) - second batch, on Harmonisation of the Unique Transaction Identifier and two consultative reports on Harmonisation of the Unique Product Identifier.[1] CPMI-IOSCO have issued the final technical guidance on UTI in February 2017, plans to issue the one on UPI around mid-2017 and on critical data elements early 2018.

The report seeks general and specific comments and suggestions from respondents by 30 August 2017, using the dedicated response form. The completed form should be sent to both the CPMI secretariat and the IOSCO secretariat.

Following feedback from market participants, the original consultation period (until 30 August 2017) has been extended to 15 September 2017 cob only for data elements related to prices, quantities and other payments (from section 2.37 to section 2.63 of the consultative report).

## Speeches

### **Jaime Caruana's intervention before the Spanish Parliament**

*Speech Intervention of Jaime Caruana, General Manager of the BIS, before the Spanish Parliament's Committee of Inquiry about the financial crisis in Spain and the financial assistance programme, Madrid, 25 July 2017.*

### **Green finance: can it help combat climate change?**

*Remarks by Luiz Awazu Pereira da Silva<sup>1</sup> at the conference organised by the BIS, OMFIF, the Deutsche Bundesbank and the World Bank Group, Frankfurt, 13 July 2017.*

The economics of climate change

"Greenhouse gas (GHG) emissions are externalities and represent the biggest market failure the world has seen".<sup>2</sup> A comprehensive and illuminating departure point for understanding the economics of climate change is the 2007 Stern Review.<sup>3</sup> Our past and present production and consumption patterns have emitted excessive greenhouse gases (GHGs), especially

carbon dioxide, whose accumulated concentration above critical thresholds<sup>4</sup> in the atmosphere affects global average temperatures, causing what is known as "global warming" or "climate change" (CC). That, in turn, affects our entire socioeconomic system through complex channels. All this can have severe consequences for global sociopolitical-economic equilibria: standards of living, productivity, refugees and massive migration, etc. And all this involves the ingredients that make collective rational decisions difficult: considerable uncertainty, large time lags before becoming apparent (especially to CC sceptics), free riding and collective action problems. That is because while CC is global, its origins are local (the tragedy of the commons), and its effects will be felt only after our generation's lives (the tragedy of the horizon<sup>5</sup>). The effects are most likely irreversible, but the science must address significant layers of uncertainty. Therefore, we are dealing with a subject that mixes uncertainty, risk, prioritising ethical choices and international coordination for the common good.

The best science today recommends stabilising the stock of GHGs below a certain target and thus acting to control and reduce new flows or emissions now in order to avoid causing irreversible damage beyond 2050. The mitigating measures naturally have a cost of abatement. Changes have to occur in production and consumption habits, and not just the obvious candidates like transportation and energy. For the sceptics that prefer a "wait and see" approach, a pure self-interested risk management strategy recommends buying the proper insurance as a kind of "pari Pascalien",<sup>6</sup> ie hedging against such a systemic global risk even if it has a small probability. There are many options for abatement, ranging from improving our current energy efficiency, to changing our energy matrix to renewable sources, to tackling non-energy emissions/damages in agriculture and deforestation. Ironically, in some options, benefits exceed costs and might create a new, virtuous, low carbon growth cycle. New technology is fundamental to reduce risk and lower abatement costs (we will come back to that later).

However, as of now and facing uncertainty, any good policy to combat CC requires a "price" to act as an incentive to reduce a negative externality such as GHGs, in line with basic welfare economics. The price needs to reflect what we already know about the medium- to long-term additional costs of CC. In theory, such a "shadow price" incorporating the social cost of carbon (SCC) would be enough to reduce emissions in a perfect Walrasian world and should be used in economic and financial calculations, in particular in the cost-benefit analysis of investment projects, to take into account these negative externalities (eg congestion, pollution, toxic emissions). But the "right price of carbon" is a tricky issue;<sup>7</sup> we need to be pragmatic and use various metrics to reach emission targets, calculating abatement costs while incorporating all the available information on new technologies that reduce them.

#### The political economy of climate change

The political economy of CC is about who will pay for what, and when and how to share the burden of abatement costs. It boils down to how CC negative externalities can be priced and incorporated into practical decision-making processes in a way that is sustainable from a sociopolitical viewpoint. If we want to limit environmental risk, there is a maximum amount of emissions permissible before our ecosystem's threshold is exceeded. Limiting emissions raises obvious issues of fairness in burden sharing. The political economy issues related to CC risks arise from misperceptions of a stock-flow problem. Our atmosphere is a stock, a finite common good that has been depleted/consumed throughout a known history of industrial development with flows of emissions of GHGs. Historically, advanced economies' emissions flows were responsible for a larger share of the depletion/consumption of the stock. They are now enjoying a higher standard of living but the remaining absorptive capacity of the stock (the atmosphere) allows limited new flows of emissions of GHGs. Thus, how should we respond to the claims of developing countries for rights to emissions since they are now beginning to industrialize and thus are increasingly responsible for the new flows? Now that the finite common good is much smaller, how to limit emissions of rich and poor while maintaining a sense of justice (more on that later)?

How can we incentivise limits and controls for everyone? First, there is the classical way of dealing with externalities through general Pigovian<sup>8</sup> taxes and subsidies. Then there is the

possibility of trading emission rights through market mechanisms and auctions. Third, one can use an implicit pricing through regulations and standards that incentivises shifts towards new, less carbon-intensive technologies. Finally, there could also be implicit pricing through reputation and exposure, by creating processes for disclosing climate-related financial assets and financed projects.<sup>9</sup>

We are dealing with a very large, potentially irreversible, negative externality with significant distributional effects across social groups and both rich and poor countries. The textbook first best solution is to use taxes and subsidies, but such a direct and transparent treatment might create political economy difficulties and, if so, delay decisions and create inertia. Therefore, a pragmatic second best solution is to use a combination of instruments that are equivalent to implicit pricing, ranging from taxes and subsidies, to carbon pricing and trading, environmental standards and regulations, and information and awareness, etc with the involvement of all agents in the economy and across several sectors.

The financial sector, central banks and climate change

Implicit pricing through indirect interventions is a delicate balancing act. For example, how can the financial sector look at CC? As the single biggest negative externality of modern times, CC entails considerable risks. We need to act now given the implications for financial stability and future generations. But how can you correct distortions using the financial sector without inadvertently creating other types of distortions? How fast can you change the incentives for financial market participants and make them adjust credit and portfolio decisions accordingly? Can you and should you use credit allocation, subsidised interest rates, etc and at the same time avoid a misperception about fairness in bearing costs? There are many experiments, especially in emerging market economies (EMEs) where such subsidised credit created other macroeconomic problems. To be fair, there are also instances where it also allowed productivity-enhancing investment and growth. At any rate, it is a complex discussion that needs to take into account governance structure, availability of instruments and the existing set of immediate risks.

Moreover, some are advocating a special role for central banks and financial regulators,<sup>10</sup> suggesting direct involvement using a wide range of instruments: climate change-related disclosures, regulatory incentives such as differentiated capital requirements, and even "green" quantitative easing (QE). Could direct central bank intervention targeting "green finance" products influence returns on green finance and be a new instrument for changing the climate course? Indeed, the emergency situation of the Global Financial Crisis (GFC) extended the role of central banks. But can "new" and even more unconventional monetary policies go further in the direction of favouring green financial instruments without creating other problems?

Changes in mandates and institutional arrangements are also very complex issues because they deal with sociopolitical equilibria, reputation and credibility. We observed that during the GFC. There is a danger of overstretching the role and mandates of central banks and financial regulators to areas where political economy problems signal that society has yet to settle debates. Naturally, having institutions of last resort to solve crises is useful, but they cannot be a substitute for a thorough discussion about fundamental issues such as CC, most likely the "mother of all structural reforms" that will require changes in deep-rooted habits of consumption and production. There is a role for public institutions, including central banks, to guide and lead by example but perhaps not to bypass, replace or over-stretch the necessary debates in civil society. Nevertheless, it is important that the financial sector use its pivotal position to raise awareness, including through its own pricing of risk and reputation. Finally, an active but transparent role by public entities to finance innovation and R&D to promote investment that limit/mitigate CC is also paramount.

The challenge will be to understand the risks and opportunities that these new policy questions bring to all of us - policymakers, the industry and society - ranging from the possible smart financing of climate change innovation, on the one hand, to increasing moral hazard, on the other.

Climate change and the financial sector: five practical steps and the way forward

Even without instruments such as "green QE", central banks and financial regulators can certainly think of practical, market-oriented ways for the financial sector to increase the flow of instruments that could meet the investment requirements of asset holders.

First, in practice, there is a need to map and identify the possible CC-related risks for the financial sector. That implies quantifying the impact on insurance liabilities and on the value of financial assets that may arise from losses related to climate change (flooding, storms, etc). That might also imply assessing potential litigation costs from losses or damages due to the effects of CC. As we suspect, if perceptions of such large liabilities arise, it might entail an asset repricing. Hence, it could impact financial stability locally and globally. One way forward, as suggested by the FSB, is to disclose CC-related information, governance practices and "moving climate-related issues into mainstream annual financial filings (-). Improved practices and techniques, including data analytics, should further improve the quality of climate-related financial disclosures and, ultimately, support more appropriate pricing of risks and allocation of capital in the global economy".<sup>11</sup>

Second, the financial sector can contribute to fund private sector investment in CC-related new technologies that is likely to bring economic and financial upsides. There are foreseeable benefits from adjusting to an economy with a smaller carbon footprint, where new policies and technology could cause a positive re-evaluation of a large range of asset classes. More generally, as green energy producers become growing sectors, there are plentiful business opportunities associated with rising income and employment as substitutes for the traditional "brown economy" (eg fossil fuels, coal, etc). Some technologies will become efficient and commercially viable/profitable. From that point, there could be some significant positive valuation effects for classes of assets and the real producers and financial intermediaries linked to these new technologies. Therefore, there needs to be financial and analytical support to construct new indices and work on practical initiatives such as the ones envisaged in the forthcoming sessions of this conference.

Third, there is a need to support the growth and consistent universal standards for label recognition of green finance, a reflexion that we have been doing at the BIS.<sup>12</sup> In that regard, green bonds are bonds that must be aligned with the four core components of the International Capital Market Association's Green Bond Principles (GBP) and where the proceeds will be exclusively applied to financing eligible green projects, aiming to address CC, natural resource depletion, biodiversity conservation and/or pollution. The first green bond, the so-called "Climate Awareness Bond", was issued 10 years ago, in June 2007, by the European Investment Bank. The largest issuers of green bonds are supranational and state agency issuers. This year to date, a total of USD 35 billion in green bonds have been issued. While the total amount of outstanding green bonds has reached around USD 200 billion, they still account for only a very small proportion of financial flows (0.2% of the total number of bonds outstanding, ie USD 100 trillion). Among green bond investors, four major types of institutional investors may be identified. First are pure green investors, which are investors with green investing mandates, offering green bond funds. Second are socially responsible investors, who are investors with established socially responsible mandates, but who are not necessarily required to buy bonds designated as green. The third group are asset managers that report a positive impact on franchise value for green investments. Finally, investors classified as banks/corporate/insurance, the treasuries of which move towards socially responsible investing.

Fourth, with this type of green finance funding, there is a greater chance of accelerating research on new technologies and creating synergies to ignite a new business cycle and the win-win situation mentioned above. Reigniting growth through investment in low carbon technologies is most likely more sustainable from a macroeconomic and environmental perspective than any of the previous consumption-led and household debt-based recoveries.<sup>13</sup> This new business cycle would be most welcome. If it begins to take shape, supported by green financing sources at the very moment where the post-GFC recovery strengthens in advanced economies, it would be an important supportive element for the post-GFC policy normalisation.

Finally, fifth, last but not least, CC requires international cooperation, as it is a unique global problem. There has been uneven progress so far in mitigating CC. Collective action and stated commitments have flourished in multilateral conferences and internationally agreed commitments such as the COP21.<sup>14</sup> But it seems that we are still not on the right path to significantly reduce our GHG emissions, even if there are some small signs of improvement.<sup>15</sup> However, recently global debates have been dominated by a reaction against multilateralism, international cooperation and coordination. New recent sociopolitical developments favour populist, national responses, protectionism and a simplistic view of globalisation as a scapegoat<sup>16</sup> for all problems such as within-country income inequality to job losses and global financial crises and despite globalisation's recognised contribution to a substantial rise in living standards and falling poverty over the past half-century. This mindset obviously does not favour the efforts to combat CC as it delays collective action and reneges on some advanced economies accepting binding and challenging targets. However, and paradoxically, it has also triggered a wake-up call in many local communities that are committed more than ever to achieving their own objectives and working for the global common good.

As mentioned earlier, developing countries need to see that their support for action combating CC needs to take into account their lower stage of industrialization. Thus, CC actions require international cooperation between advanced and developing countries and the recognition of the need for technology transfers and increases in official development assistance to developing countries.

On balance, this might create more support and trigger the necessary impulse through debate. "It is intensive public discussion that will [-] be the ultimate enforcement mechanism".<sup>17</sup> For us in the financial sector, this is certainly a contribution that we can make. Thus, the answer to the question of whether green finance can help combat climate change is yes. The financial sector can play a positive role: mapping and identifying CC-related risks; strengthening the process of labelling green finance instruments in a rigorous and credible way; fostering private sector investment in CC-related new technologies; accelerating research on new technologies and creating synergies to ignite a new business cycle; helping to engineer a virtuous new less carbon-intensive growth cycle; and being respectful of the challenges of international cooperation. These are a few among many elements that the BIS had in mind when accepting to co-organise this event with OMFIF, the Deutsche Bundesbank and the World Bank.

### **General Manager's speech: Looking beyond the here and now**

*Speech and presentation of the key messages of the BIS Annual Report delivered by Mr Jaime Caruana, General Manager of the BIS, on the occasion of the Bank's Annual General Meeting, Basel, 25 June 2017.*

Global growth has broadened and strengthened during the past year, and the near-term outlook appears the best in a long while. The most promising policy strategy is to take advantage of these tailwinds to build greater economic resilience, nationally and globally, so as to be better prepared for future adverse events. One aspect is to preserve the benefits of trade and financial openness. The other is to adopt a longer-term perspective in policymaking. This entails enhancing policy space and strengthening the capacity of the economy to adapt to long-term trends. Building resilience is first and foremost a domestic task. But certain challenges call for a global response and require international cooperation. Completing Basel III is a priority in this regard.

### **How much do we really know about inflation?**

*Presentation on the BIS Annual Report by Mr Claudio Borio, Head of the Monetary and Economic Department, on the occasion of the Bank's Annual General Meeting, Basel, 25 June 2017.*

An obvious policy question at the current juncture is whether an inflation flare-up could bring to an end the expansion under way. This question, in turn, begs an even more fundamental one: how much do we really know about the inflation process? Based on analysis presented in BIS Annual Reports, this presentation reaches three conclusions: we may be

underestimating the influence that globalisation has had on inflation; if so, a flare-up may not be that likely; and if the hypothesis is correct, it would also point to refinements to current monetary policy strategies.

### **Globalisation: real and financial**

*Presentation on the BIS Annual Report by Mr Hyun Song Shin, Economic Adviser and Head of Research, on the occasion of the Bank's Annual General Meeting, Basel, 25 June 2017.*

Many years into the crisis, there are finally some consistent signs of a rebound in activity, some reflation and more optimism in markets, with a rise in equities and higher confidence. But the puzzling element is that policy uncertainty is very high while volatility is very low. What's going on? Perhaps the most significant risk for financial markets now is the risk of complacency and self-delusion with positive but only short-term indicators. There seems to be an underestimation of the long-term consequences of political risks in a context of increasing scepticism about trade/financial integration and international cooperation.

### **Banking regulation and supervision after the crisis - where are we now, and what lies ahead?**

*Speech by Mr Fernando Restoy,<sup>1</sup> Chairman, Financial Stability Institute, Bank for International Settlements, at the CIRSF Annual International Conference, Lisbon, 1 June 2017.*

I would like to briefly return to the efforts currently under way to finalise the post-crisis regulatory reforms, of which Basel III is a significant component. This is certainly not the first time the Basel Committee has gone through difficult negotiations to reach an agreement, and I'm sure it won't be the last. But I am confident that the Committee will once again achieve a successful outcome.

Indeed, having recently experienced an extremely costly financial crisis and the attendant disturbances in the functioning of the international financial system, the need for robust international regulatory standards is more evident now than ever before. In a world in which internationally active financial groups transmit risks seamlessly across borders, there should be a shared interest across all jurisdictions that such groups meet sufficiently stringent standards of solvency and liquidity. Moreover, to the extent that an integrated global financial system contributes to effective risk-sharing across jurisdictions and regions and amplifies investment and funding opportunities for firms and households wherever they are located, it is vital that we do what we can to facilitate the operations of international players and promote a level playing field through the harmonisation of both prudential requirements and, ideally, supervisory practices.

As I mentioned before, however, globally harmonised standards and practices need not be applied to all banks in all jurisdictions. It may be appropriate to apply simpler rules and less intrusive practices in the case of smaller, less sophisticated banks, as is the case now in many jurisdictions. But at the same time, we need to keep in mind that the application of the proportionality principle should not compromise the stringency of the prudential requirements. It should also carefully weigh potential distortions in the normal functioning of market forces.

In any event, notwithstanding the current emphasis on finalising the last few pieces in the post-crisis reforms, I anticipate that the focus of the international regulatory community will soon shift from standard setting to policy implementation matters. For its part, the Basel Committee signalled this shift in its recently published 2017-18 workplan, which has the Committee paying greater attention to supervisory matters. And let me just mention that, through its various activities, the Financial Stability Institute will support authorities' renewed focus on implementation. I would be happy to provide more information about our work in this area in the discussion that follows, or on the sidelines of the meeting.