

BIS Quarterly Review

International banking and financial market developments

June 2020

BIS Quarterly Review
Monetary and Economic Department

Editorial Committee:

Claudio Borio Stijn Claessens Benoît Mojon Hyun Song Shin Philip Wooldridge

General queries concerning this commentary should be addressed to Philip Wooldridge (tel +41 61 280 8006, e-mail: philip.wooldridge@bis.org), queries concerning specific parts to the authors, whose details appear at the head of each section, and queries concerning the statistics to Patrick McGuire (tel +41 61 280 8921, e-mail: patrick.mcguire@bis.org).



This publication is available on the BIS website (http://www.bis.org/publ/qtrpdf/r_qt2006.htm).

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ISSN 1683-0121 (print)
ISSN 1683-013X (online)

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Notations used in this Review

billion	thousand million
e	estimated
lhs, rhs	left-hand scale, right-hand scale
\$	US dollar unless specified otherwise
...	not available
.	not applicable
–	nil or negligible

Differences in totals are due to rounding.

The term "country" as used in this publication also covers territorial entities that are not states as understood by international law and practice but for which data are separately and independently maintained.

Abbreviations

Currencies

ALL	Albanian lek	MXN	Mexican peso
ARS	Argentine peso	MXV	Mexican unidad de inversión (UDI)
AUD	Australian dollar	MYR	Malaysian ringgit
BGN	Bulgarian lev	NAD	Namibian dollar
BHD	Bahraini dinar	NGN	Nigerian naira
BRL	Brazilian real	NOK	Norwegian krone
CAD	Canadian dollar	NZD	New Zealand dollar
CHF	Swiss franc	OTH	All other currencies
CLP	Chilean peso	PEN	Peruvian sol
CNY (RMB)	Chinese yuan (renminbi)	PHP	Philippine peso
COP	Colombian peso	PLN	Polish zloty
CZK	Czech koruna	RON	Romanian leu
DKK	Danish krone	RUB	Russian rouble
EUR	euro	SAR	Saudi riyal
GBP	pound sterling	SEK	Swedish krona
HKD	Hong Kong dollar	SGD	Singapore dollar
HUF	Hungarian forint	THB	Thai baht
IDR	Indonesian rupiah	TRY	Turkish lira
ILS	Israeli new shekel	TWD	New Taiwan dollar
INR	Indian rupee	USD	US dollar
ISK	Icelandic króna	VES	bolívar soberano
JPY	Japanese yen	VND	Vietnamese dong
KRW	Korean won	XOF	CFA franc (BCEAO)
MAD	Moroccan dirham	ZAR	South African rand

Countries

AE	United Arab Emirates	CY	Cyprus
AF	Afghanistan	CZ	Czech Republic
AL	Albania	DE	Germany
AM	Armenia	DJ	Djibouti
AO	Angola	DK	Denmark
AR	Argentina	DM	Dominica
AT	Austria	DO	Dominican Republic
AU	Australia	DZ	Algeria
AZ	Azerbaijan	EA	euro area
BA	Bosnia and Herzegovina	EC	Ecuador
BD	Bangladesh	EE	Estonia
BE	Belgium	EG	Egypt
BF	Burkina Faso	ER	Eritrea
BG	Bulgaria	ES	Spain
BH	Bahrain	ET	Ethiopia
BI	Burundi	FI	Finland
BJ	Benin	FJ	Fiji
BM	Bermuda	FO	Faeroe Islands
BN	Brunei	FR	France
BO	Bolivia	GA	Gabon
BR	Brazil	GB	United Kingdom
BS	The Bahamas	GD	Grenada
BT	Bhutan	GE	Georgia
BY	Belarus	GH	Ghana
BZ	Belize	GN	Guinea
CA	Canada	GQ	Equatorial Guinea
CD	Democratic Republic of the Congo	GR	Greece
CF	Central African Republic	GT	Guatemala
CG	Republic of Congo	GW	Guinea-Bissau
CH	Switzerland	GY	Guyana
CI	Côte d'Ivoire	HN	Honduras
CL	Chile	HK	Hong Kong SAR
CM	Cameroon	HR	Croatia
CN	China	HT	Haiti
CO	Colombia	HU	Hungary
CR	Costa Rica	ID	Indonesia
CV	Cabo Verde	IE	Ireland

Countries (cont)

IL	Israel	MX	Mexico
IN	India	MY	Malaysia
IQ	Iraq	MZ	Mozambique
IR	Iran	NA	Namibia
IS	Iceland	NC	New Caledonia
IT	Italy	NG	Nigeria
JE	Jersey	NL	Netherlands
JM	Jamaica	NO	Norway
JO	Jordan	NR	Nauru
JP	Japan	NZ	New Zealand
KE	Kenya	OM	Oman
KG	Kyrgyz Republic	PA	Panama
KH	Cambodia	PE	Peru
KR	Korea	PG	Papua New Guinea
KW	Kuwait	PH	Philippines
KY	Cayman Islands	PK	Pakistan
KZ	Kazakhstan	PL	Poland
LA	Laos	PT	Portugal
LB	Lebanon	PY	Paraguay
LC	St Lucia	QA	Qatar
LK	Sri Lanka	RO	Romania
LR	Liberia	RS	Serbia
LS	Lesotho	RU	Russia
LT	Lithuania	RW	Rwanda
LU	Luxembourg	SA	Saudi Arabia
LV	Latvia	SC	Seychelles
LY	Libya	SD	Sudan
MA	Morocco	SE	Sweden
MD	Moldova	SG	Singapore
ME	Montenegro	SK	Slovakia
MH	Marshall Islands	SI	Slovenia
MK	North Macedonia	SR	Suriname
ML	Mali	SS	South Sudan
MM	Myanmar	ST	São Tomé and Príncipe
MN	Mongolia	SV	El Salvador
MO	Macao SAR	SZ	Eswatini
MR	Mauritania	TD	Chad
MT	Malta	TG	Togo
MU	Mauritius	TH	Thailand
MV	Maldives	TJ	Tajikistan
MW	Malawi	TL	East Timor

Countries (cont)

TM	Turkmenistan	VC	St Vincent and the Grenadines
TO	Tonga	VE	Venezuela
TR	Turkey	VG	British Virgin Islands
TT	Trinidad and Tobago	VN	Vietnam
TW	Chinese Taipei	XM	euro area
TZ	Tanzania	ZA	South Africa
UA	Ukraine	ZM	Zambia
US	United States	1C	International organisations
UY	Uruguay	1Z	British West Indies
UZ	Uzbekistan		

Stefan Avdjiev
stefan.avdjiev@bis.org

Patrick McGuire
patrick.mcguire@bis.org

Goetz von Peter
goetz.vonpeter@bis.org

International dimensions of EME corporate debt¹

International credit can be fickle and subject to sudden stops during periods of global economic stress. Non-financial corporate borrowers that rely on credit from abroad are vulnerable to reversals in capital flows. Similarly, corporates that borrow in foreign currency may face problems rolling over their debt when the local currency depreciates or global dollar funding conditions tighten. This feature draws on several BIS data sets to examine corporates' external and foreign currency debt for key emerging market economies on the eve of the Covid-19 outbreak.

JEL classification: F34, F65.

Since the Great Financial Crisis (GFC) of 2007–09, corporate borrowers in many emerging market economies (EMEs) have increasingly turned to external sources of funding, much of it denominated in foreign currencies. Such debt can be susceptible to sudden stops (Calvo (1998), Forbes and Warnock (2012)), which often lead to sharp contractions in economic activity.²

This feature uses several BIS data sets to examine two dimensions of EME corporates' debt at end-2019, on the eve of the Covid-19 outbreak. We first estimate *externally funded debt*, comprising cross-border credit in the form of bonds held by non-residents and loans from banks abroad, denominated in any currency. Then, drawing on the currency dimension in BIS statistics (one of their key strengths), we estimate *foreign currency debt* owed by corporates to all creditors, domestic and foreign. The two dimensions overlap, but also differ in ways that can have important implications for borrowers' susceptibility to sudden stops.

We focus on EME non-financial corporates (NFCs) because they stand out in terms of borrowing externally and in foreign currencies.³ In particular, they

¹ The authors thank Iñaki Aldasoro, Claudio Borio, Michael Chui, Stijn Claessens, Mathias Drehmann, Bryan Hardy, Catherine Koch, Dubravko Mihaljek, Swapan-Kumar Pradhan, Hyun Song Shin and Philip Wooldridge for valuable comments, and Bat-el Berger, Jakub Demski, Kristina Micic and Marjorie Santos for excellent research assistance. The views expressed in this article are those of the authors and not necessarily those of the Bank for International Settlements.

² In the run-up to the GFC, cross-border credit to EMEs, provided mainly by global banks, fuelled domestic credit booms, and the reversal in credit flows during the crisis exacerbated the economic downturns that followed (Borio, McCauley and McGuire (2011), Ehlers and McGuire (2017)).

³ Previous crises in EMEs tended to be associated with international borrowing by sovereigns (eg in the 1980s) or banks and other financial institutions (eg in the 1990s). Sovereigns have moved from

Key takeaways

- Corporates in many emerging market economies borrowed increasingly from external sources in foreign currencies during the decade prior to the Covid-19 crisis.
- Such debt is susceptible to sudden stops, although foreign currency revenues and other hedges reduce corporates' vulnerability.
- BIS statistics can help track the evolution of externally funded debt and foreign currency debt in a granular way.

accounted for much of the post-GFC increase in total dollar credit to all EME non-bank borrowers, which rose from \$1.6 trillion in 2009 to \$3.8 trillion at end-2019. The economic shutdown in 2020 and associated disruptions in supply chains, falls in sales and drops in commodity prices squeezed many corporates, casting doubt on their ability to service their debts (Eichengreen (2020)).

While reliance on external and foreign currency debt has in the past heightened vulnerabilities (eg to capital flow reversals or exchange rate depreciations), our measures by themselves paint an incomplete picture. A full assessment of vulnerabilities would incorporate factors such as revenues, assets and intragroup linkages. For example, commodity exporters and other corporates with foreign currency revenues have a natural hedge for dollar debt. Many own substantial foreign currency assets too, as do the countries in which they operate.

These factors should be kept in mind when interpreting our measures for specific countries. For most of the EMEs examined here, the ratio of NFCs' estimated foreign currency debt to GDP was less than 15% at end-2019. Of the few with higher ratios, some are commodity exporters. Across most EMEs, the bulk of NFCs' foreign currency debt is denominated in US dollars. While much of NFCs' debt remains in the form of bank loans, the issuance of international debt securities has gained ground since the GFC, especially if offshore issuance by NFCs' foreign affiliates is taken into account.

In the next section, we present measures of the total debt of NFCs in 16 major EMEs at end-2019, the latest quarter for which comprehensive data are available. The following two sections then present our estimates of externally funded and foreign currency debt, and discuss their limitations. The box explains how we construct these estimates. In the final section, we employ commercial data sources on dollar-denominated international bonds and syndicated loans to gauge how debt stocks have evolved since the global spread of Covid-19.

borrowing in foreign currency towards doing so in domestic currency (Cantú, Goel and Schanz (2020, in this issue)), and banks manage their currency mismatches more carefully now.

NFCs' debt in context

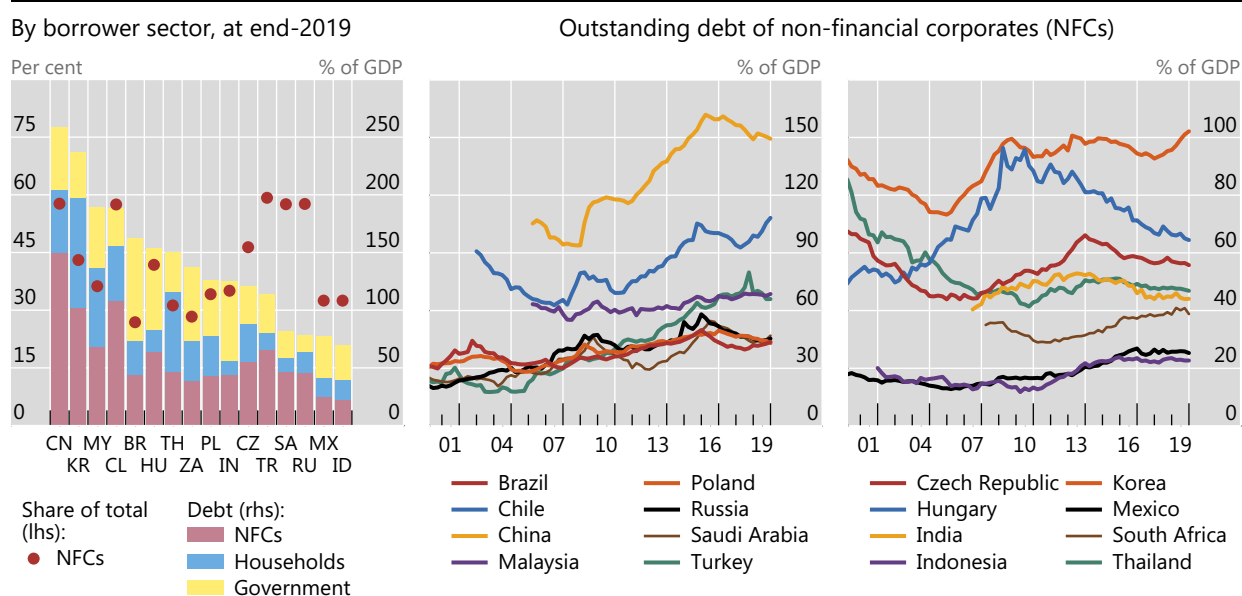
The characteristics of NFCs' debt often differ from those of other non-financial borrowers. In many EMEs, government debt increasingly consists of bonds in domestic currency (Cantú, Goel and Schanz (2020, in this issue)), while household debt is mainly domestic loans in domestic currency. In contrast, NFC debt is a combination of bonds and loans, and both in domestic and in foreign currencies.

Since the GFC, the total debt of NFCs in EMEs has grown substantially in absolute terms, and slightly faster than that of other non-financial borrowers (ie governments and households). At end-2019, NFCs resident in the 16 EMEs in Graph 1 combined had outstanding debt of \$28.6 trillion, up from \$10.5 trillion at end-2009.⁴ This amounted to 51% of the total debt of non-financial borrowers in these countries at end-2019, slightly higher than the share at end-2009. NFCs' debt made up more than half of non-financials' total debt in Chile, China, Russia, Saudi Arabia and Turkey, and it exceeded 40% in the Czech Republic, Hungary and Korea (left-hand panel).

With debt growing faster than nominal GDP, the ratio of resident NFCs' debt to GDP was considerably higher than before the GFC for several EMEs (Graph 1, centre and right-hand panels). This ratio surpassed 100% for China, Korea and Chile at end-2019, and was above 60% for Hungary, Malaysia and Turkey. While the ratios for Brazil, the Czech Republic and Poland have trended downwards in recent years, they remained higher at end-2019 than their pre-GFC levels.

Total debt of non-financial borrowers in selected EMEs¹

Graph 1



¹ The data used in the BIS total credit statistics are based on national financial balance sheet accounts for those countries that compile these data. For others (ID, IN, MY, SA, TH and ZA), the BIS's estimates sum cross-border and domestic bank credit, and do not capture non-bank creditors' holdings of debt securities; for CN and RU, credit from non-banks is also included. See Dembiermont et al (2013).

Sources: National data; BIS total credit statistics.

⁴ Total credit to NFCs in China stood at \$21.2 trillion at end-2019, up by \$15.3 trillion (more than 250%) since end-2009. Total credit to NFCs in all other countries in Graph 1 rose by a combined \$2.8 trillion, or 61%, over this period.

Estimating externally funded and foreign currency debt with BIS statistics

This box details the construction of the debt measures presented in the main text, and follows closely the methodology in Borio, McCauley and McGuire (2011) and McCauley, McGuire and Sushko (2015a,b).

Externally funded debt (EFD)

Our measure of NFCs' externally funded debt is that sector's external debt liabilities in the form of bonds and loans (measured as for a country), plus the part which that sector receives indirectly via banks that borrow (net) from abroad. We proxy this as the sum of (1) international debt securities issued by resident NFCs and (2a) direct and (2b) indirect cross-border bank credit to resident NFCs, in any currency. Constructing this proxy relies on a few assumptions.

For the non-resident bond holdings (part 1), we take outstanding issues of international debt securities (IDS) as a proxy. These securities could, in principle, be held by residents of the country. However, for most EMEs discussed in this feature, NFCs' outstanding IDS match their cross-border debt security liabilities as recorded in International Investment Position (IIP) data (grey dots in Graph 2), with Korea and Russia being exceptions.

For direct cross-border bank credit (part 2a), we use the BIS locational banking statistics (LBS), which historically have tracked cross-border bank loans to *all* non-banks. A breakdown of non-banks into non-bank financials (NBFs) and the subsectors of non-financials (ie NFCs, households and governments) was introduced in 2013. Most reporting countries do separately report positions with NBFs and non-financials, but many do not report the non-financial subsectors (Garcia Luna and Hardy (2019)). We thus proxy cross-border bank loans to NFCs as cross-border loans to all non-banks less the *observed* loans to NBFs, governments and households (red bars in Graph 2). While this could overstate cross-border loans to NFCs, cross-border loans to the other non-financial subsectors are generally small.

Indirect cross-border bank credit (part 2b) is net cross-border borrowing (if positive) by banks located in the country; this is the part of domestic bank credit that is funded abroad. For those EMEs that report the LBS, we use cross-border liabilities minus cross-border claims of banks located in the country. For those EMEs that do not report the LBS, we take these figures from their international investment position (PL and TH), or use net claims (claims minus liabilities) on banks in the country, as reported by banks in all BIS reporting countries (CZ and HU). All measures include intragroup positions. These measures may overstate indirect credit to NFCs since it could be used to fund domestic bank credit to other non-bank borrowers (governments, households or non-bank financial institutions).

Foreign currency debt (FCD)

NFCs' foreign currency debt is debt denominated in a currency other than that of the borrower country, regardless of whether it is held by investors locally or abroad. It is the sum of all foreign currency cross-border and local loans to, and international debt securities issued by, NFCs. The IDS are constructed from securities-level data complete with currency information, and thus yield a clean measure of NFCs' foreign currency debt security liabilities. However, an estimate of cross-border and local bank loans in foreign currencies requires a few assumptions.

In the LBS, cross-border loans are reported separately for (a) each of five major currencies (USD, EUR, JPY, GBP and CHF), (b) the domestic currency of the reporting bank, and (c) residual foreign currencies from the perspective of the reporting bank. Parts (a) and (b) are foreign currencies from the perspective of EME borrowers. For part (c), the currency is not known, but we assume this piece is also denominated in foreign currencies even though it could include loans denominated in the currency of the borrower country.^①

The measure for local loans in foreign currencies depends on the EME in question. The figures for BR, CL, ID, IN, KR, MX, MY, TR and ZA are local foreign currency loans to non-banks in their reported LBS data. The breakdown of these foreign currency loans in the five major currencies is estimated for ID and MY, using the currency breakdown of cross-border loans to the banking sector. For RU and TR, US dollar- and euro-denominated local loans are calculated following the [global liquidity indicator](#) estimates. Estimates for CN, CZ, HU and PL are based on national data on domestic credit in foreign currencies, which, for some of these EMEs, includes credit to all non-banks. The estimate for SA is outstanding amounts of foreign currency syndicated term loans, derived from loan-level data from Dealogic. For TH, we proxy foreign currency loans to NFCs by the difference between international claims on the non-bank private sector from the BIS consolidated banking statistics (CBS) and cross-border claims on NFCs from the LBS.^②

^① For example, Canadian dollar cross-border loans to Brazil reported by banks in Canada would be reported under part (b), and their Singapore dollar and Brazilian real cross-border loans would be reported together under part (c), as residual foreign currencies. ^② In the CBS, international claims on borrowers in a particular country comprise all cross-border claims and any locally extended claims in foreign currencies. Claims include loans, holdings of securities and other financial assets.

Externally funded debt

External debt is the stock of debt liabilities held by creditors residing outside the borrower country. It includes all cross-border credit in the form of bonds held by non-residents and loans from banks abroad, denominated in any currency. For a country as a whole, these external debt liabilities are measured on a residency basis as part of the country's international investment position. Here, we focus on the external debt of the NFC sector and go one step further than the standard measure: we add *indirect* external bank credit to NFCs, ie the part of domestic credit that resident banks fund through net borrowing abroad (see box).⁵ We call this aggregate NFCs' *externally funded debt (EFD)*.⁶

EMEs differ in their reliance on loan versus bond funding (Graph 2, left-hand panel). International debt securities (yellow bars) make up more than half of NFCs' externally funded debt in Chile, Korea and Mexico, but less than a tenth in Hungary, Poland and Turkey.⁷ Those NFCs relying more on loans often obtain them through the indirect channel (blue bars), notably those in emerging Europe and East Asia. Hardy (2019) notes that, in emerging Europe, the local affiliates of foreign banks often borrow within their banking group to fund domestic lending. Also, a large share of trade finance is channelled through local banks.

Across EMEs, the reliance of NFCs on EFD reflects the size and openness of the economies they operate in. In absolute terms, EFD at end-2019 was highest for NFCs in China, followed by India, Mexico and Brazil, all among the largest EMEs (Graph 2, left-hand panel). Scaling by GDP puts these amounts into perspective (right-hand panel). The half-trillion EFD of NFCs resident in China amounted to only 3.3% of Chinese GDP – the lowest ratio in the sample. At the other end of the spectrum are smaller financially open economies, where NFCs' EFD surpassed 20% of GDP. Some NFCs resident in EMEs have foreign parents that may guarantee portions of the debt incurred, although BIS data do not reveal this.

One source of stability is the fact that many NFCs issue bonds with long maturities, and thus face limited rollover risk. At end-2019, only a small fraction was due for repayment within a year (Graph 3, left-hand panel). The share was below 10% for most EMEs shown. All this, however, does not preclude a tightening of financial conditions if foreign investors sell their holdings (see last section).

⁵ Adding indirect cross-border bank credit may overstate credit to NFCs in a country because this credit may be passed on to sectors other than NFCs.

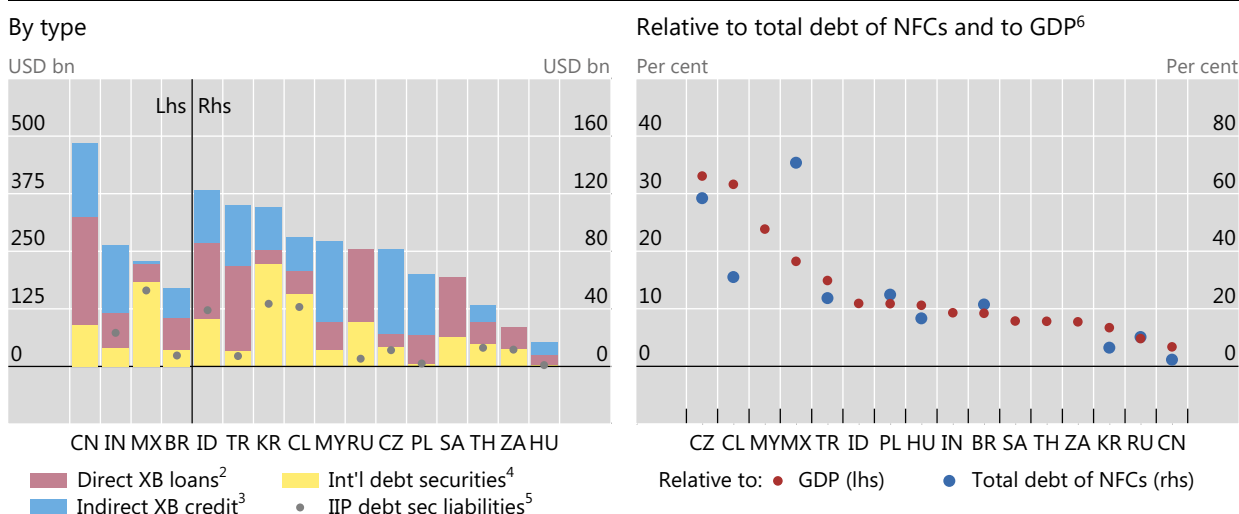
⁶ The estimates in this section are on a residency basis, following international reporting standards (Tissot (2016)). Offshore debt (ie bonds issued by affiliates abroad) is incorporated in the next section.

⁷ The outstanding stock of international debt securities (IDS) may overstate externally funded debt if these securities are held by residents. For most countries in Graph 2, the stock roughly matches cross-border debt security liabilities as tracked in international investment position (IIP) data, with Korea and Russia being exceptions (grey dots, left-hand panel). We nevertheless use the IDS series, since it provides the currency breakdown needed in the following two sections.

Externally funded debt of non-financial corporates¹

At end-2019

Graph 2



¹ Estimates of externally funded debt of non-financial corporates (NFCs), comprising the sector's external debt liabilities (bonds and loans) plus indirect bank credit that banks fund through net borrowing abroad (see box). ² Cross-border loans to non-banks minus loans to non-bank financial institutions, households and government, from the BIS locational banking statistics. ³ Net cross-border borrowing by banks located in the country (see box). ⁴ NFCs' outstanding international debt securities from the BIS international debt securities. ⁵ NFCs' cross-border debt security liabilities as reported in the international investment position (IIP), for the latest data available. ⁶ Externally funded debt of NFCs, as a share of total debt of NFCs (blue dots) and as a ratio to GDP (red dots). Blue dots are shown for countries that compile financial balance sheet accounts and/or have comprehensive total debt measures (Graph 1).

Sources: IMF; Dealogic; Euroclear; Thomson Reuters; TRAX; BIS locational banking statistics; national data.

Cross-border bank credit, which tends to have shorter maturities, can contract more quickly during stress periods such as the GFC. While BIS data do not track the maturity profile of lending to NFCs specifically, they do provide a maturity breakdown of banks' international claims on borrowers in all sectors taken together (Graph 3, right-hand panel).⁸ On average, short-term claims – defined as those with a remaining maturity of up to one year – accounted for over 40% of total claims, with higher shares for China (64%) and Korea (57%) and lower shares for Russia (26%) and Poland (23%). These figures overstate the share of short-term claims on NFCs in those countries that receive more (short-term) interbank credit overall (eg EMEs in Asia). That said, (net) interbank borrowing can be relevant to the NFC sector through the indirect channel shown in Graph 2.

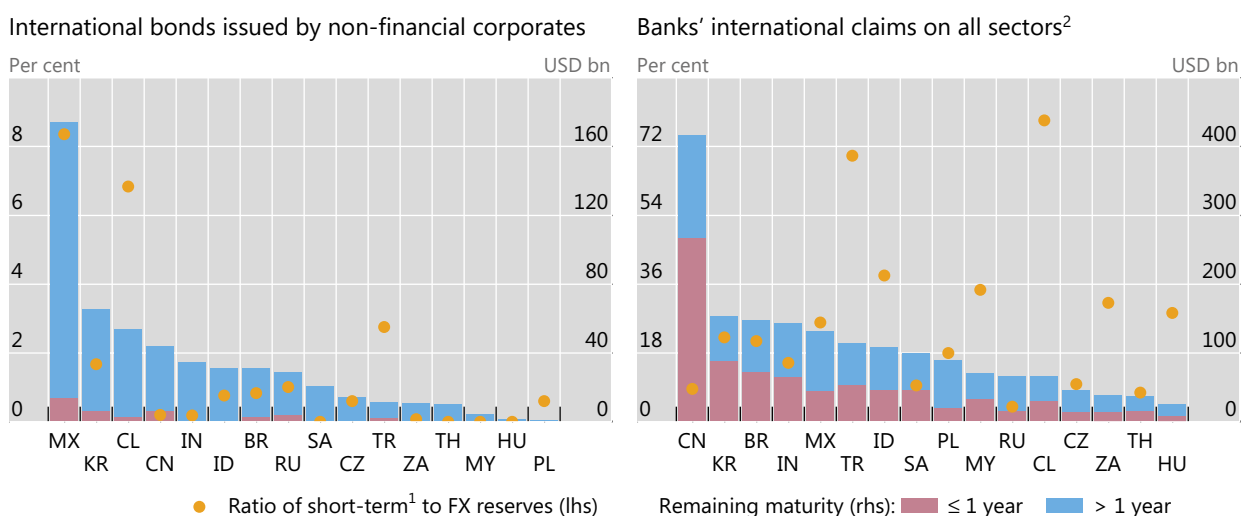
Applying a simple standard reserve-adequacy rule suggests that the EMEs shown here should be able to weather plausible contractions in short-term credit to their NFCs over the near term (yellow dots in Graph 3). The ratio of short-term debt to international reserves became a key metric characterising the EME crises in the 1990s (Chang and Velasco (1999), IMF (2016)). The ratios here lie well below 100% for most of the countries shown, although they will of course be higher when the external liabilities of other sectors are included as well. Any vulnerability assessment would recognise that many EMEs have substantial external assets and natural hedges in the form of export revenues too.

⁸ International claims include loans, bonds and other financial claims extended cross-border or locally in foreign currencies. By including all sectors, they overstate credit to the NFCs but are correlated with both external and foreign currency bank credit.

Measures of EME short-term debt

At end-2019

Graph 3



¹ Outstanding amount with a remaining maturity of one year or less. ² BIS reporting banks' international claims on all counterparty sectors from the BIS consolidated banking statistics. International claims comprise cross-border claims in all currencies and claims extended locally in a non-local currency by banks' affiliates in the borrower country.

Sources: IMF; Dealogic; Euroclear; Thomson Reuters; TRAX; BIS consolidated banking statistics (immediate counterparty basis); BIS calculations.

Foreign currency debt

Total foreign currency debt (FCD) includes any loans and debt securities denominated in foreign currencies (see box). Foreign currency debt, if not hedged, can pose financial stability risks through the financial channel of the exchange rate (Chang and Velasco (1999), Bruno and Shin (2015)). Sharp depreciations of EME currencies against the US dollar (such as those that took place during the Covid-19 stress period) reduce the creditworthiness of currency-mismatched EME borrowers and lead to a tightening of financial conditions through both demand and supply effects.

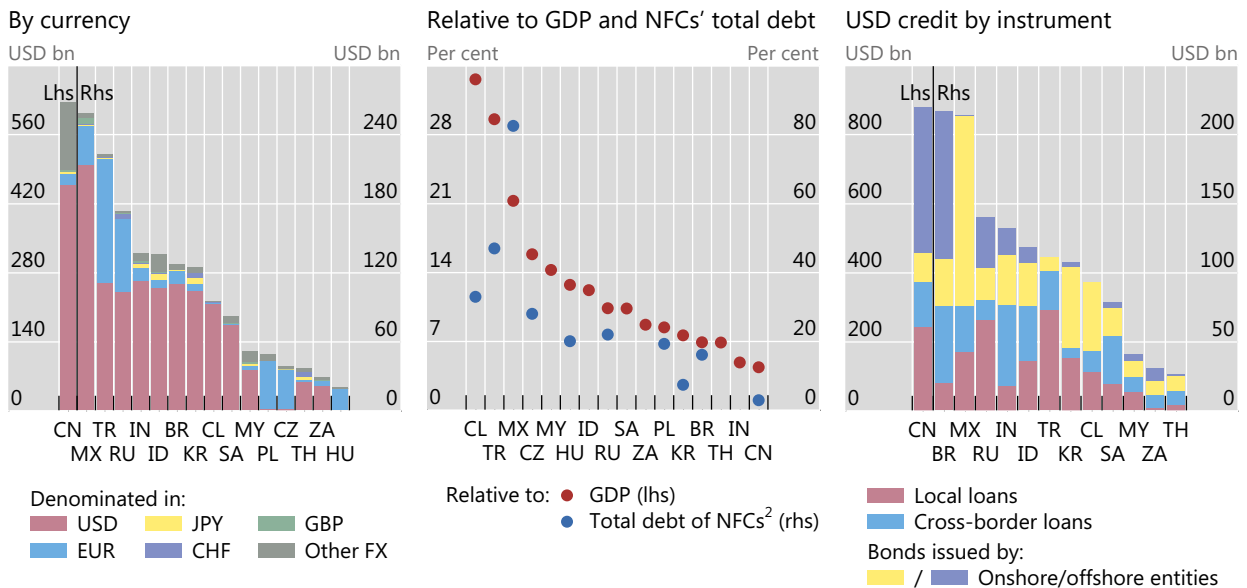
Rankings of EMEs based on the level and relative importance of FCD (Graph 4) are similar to those based on EFD discussed above, albeit with exceptions. This is not surprising given that most external debt is denominated in foreign currencies. By outstanding stocks at end-2019 (left-hand panel), China, Mexico and India were among the top five EMEs on both measures. And when FCD is scaled by GDP (centre panel), the five EMEs (Chile, Turkey, Mexico, Czech Republic and Malaysia) that emerge on top are exactly the same as in the case of EFD, albeit in a different order. That said, the two indicators differ for several EMEs. FCD is considerably higher (15% of GDP) than EFD for Turkey. By contrast, EFD exceeds FCD by a wide margin in the Czech Republic (17% of GDP) and Malaysia (10% of GDP).

US dollar debt accounted for the bulk of FCD in most EMEs (Graph 4, left-hand panel, red bars). The dominance of the dollar is most pronounced in emerging Asia and Latin America. By contrast, emerging Europe relies more on euro-denominated credit (blue bars).

Foreign currency debt of non-financial corporates (NFCs) in selected EMEs¹

At end-2019

Graph 4



¹ For details on the calculations, see box. ² Blue dots are shown for countries that compile financial balance sheet accounts and/or have comprehensive total debt measures (Graph 1).

Sources: Dealogic; Euroclear; Thomson Reuters; TRAX; national data; BIS locational banking statistics by residence; BIS calculations.

Any assessment of vulnerabilities related to FCD should take into account several additional points about the incompleteness of available data. First, the benchmark FCD estimates in the left-hand panel of Graph 4 actually underestimate the foreign currency debt since they are based on the residence (as opposed to the nationality) of borrowers.⁹ They ignore the fact that some NFCs have issued debt securities through offshore entities (McCauley et al (2015b), Coppola et al (2020)). Once this offshore issuance is taken into account, the US dollar debt of several major EMEs, notably Brazil, China, India and Russia, rises considerably (Graph 4, right-hand panel).

Second, the amounts owed in foreign currencies could be higher still, since the estimates in Graph 4 capture only on-balance sheet liabilities; they do not include borrowing through FX derivatives. Many NFCs sell commodities and finished products, or buy manufacturing inputs on global markets, where the US dollar is used as an invoicing currency. They may hedge future foreign currency payment and revenue streams using FX forwards. While exact numbers for EME borrowers are not available, a rough estimate suggests around \$2 trillion in dollar repayment obligations via FX derivatives at end-2019, on top of nearly \$2.6 trillion in on-balance sheet dollar debt.¹⁰ Even when derivatives are used to hedge FX risk, they can still involve significant liquidity risk due to maturity mismatches.

⁹ See Avdjiev, McCauley and Shin (2016) for a discussion of why the traditional assumption of a “triple coincidence” of GDP area, decision-making unit and currency area in international finance is often misleading.

¹⁰ The BIS over-the-counter derivatives statistics on which this estimate is based do not break out dollar borrowing via FX swaps by non-banks in EMEs. However, at-end 2019, EMEs accounted for about half of global trade, which importers/exporters hedge using FX forwards and swaps, and for 43% of outstanding US dollar debt securities, which are hedged by currency swaps (Borio, McCauley and McGuire (2017)). Applying these shares to all non-financials’ \$7.8 trillion in dollar positions in these instruments and dividing by two yields the estimate for EME non-financials.

At the same time, there are several important factors that tend to mitigate FCD-related risks. For example, commodity exporters (eg Chile, Mexico, Russia and Saudi Arabia) have natural hedges in the form of dollar-denominated revenues. That said, the recent sharp fall in commodity prices may leave these exporters exposed. Meanwhile, NFCs, as well as other sectors in EMEs, hold foreign currency assets that can be drawn on to service debt in times of need. NFCs from EMEs have placed nearly \$1 trillion in dollar and euro deposits with BIS reporting banks, and may have other foreign currency assets, such as foreign direct investment, that are more difficult to observe (and liquidate). Broadening this to all sectors, Hungary, South Africa, the Czech Republic, Chile and Malaysia each hold foreign currency assets worth more than 100% of GDP; many other EMEs also have more foreign currency assets than liabilities in their international investment position (IMF (2019), Bénétrix et al (2019)). The precise impact of the above factors on alleviating currency mismatches is not clear in the aggregate data, but authorities in some EMEs (eg Chile) monitor corporates' FX exposures to ensure they are properly hedged (Central Bank of Chile (2018)).

Dollar debt in early 2020

How has US dollar credit to EME NFCs evolved during the pandemic? The most recent BIS international banking statistics relate to end-2019, and thus do not cover that period.¹¹ For their part, the BIS IDS statistics are available at end-Q1 2020, and show that outstanding stocks of EME NFCs' international debt securities actually increased marginally in the first quarter.

To examine these dollar debt stocks further into 2020, we employ Dealogic data on syndicated loans and bond issuance, which are less complete but available on a timelier basis. Graph 5 juxtaposes the estimated stock of cross-border dollar debt of several major EMEs through to end-2019 (black line) against the stock derived from Dealogic data (stacked bars) for selected EMEs.¹² On the surface, the latest data do not show a contraction in NFCs' cross-border dollar debt stocks during the pandemic, mainly due to the long maturity of this debt (recall Graph 3). Indeed, it is possible that outstanding debt stocks may have increased, since corporates facing cash flow problems are likely to have tapped their credit lines in early 2020. Such drawdowns generate new credit, adding to outstanding bank claims.¹³

¹¹ Data for Q1 2020 are expected to be released by end-July 2020.

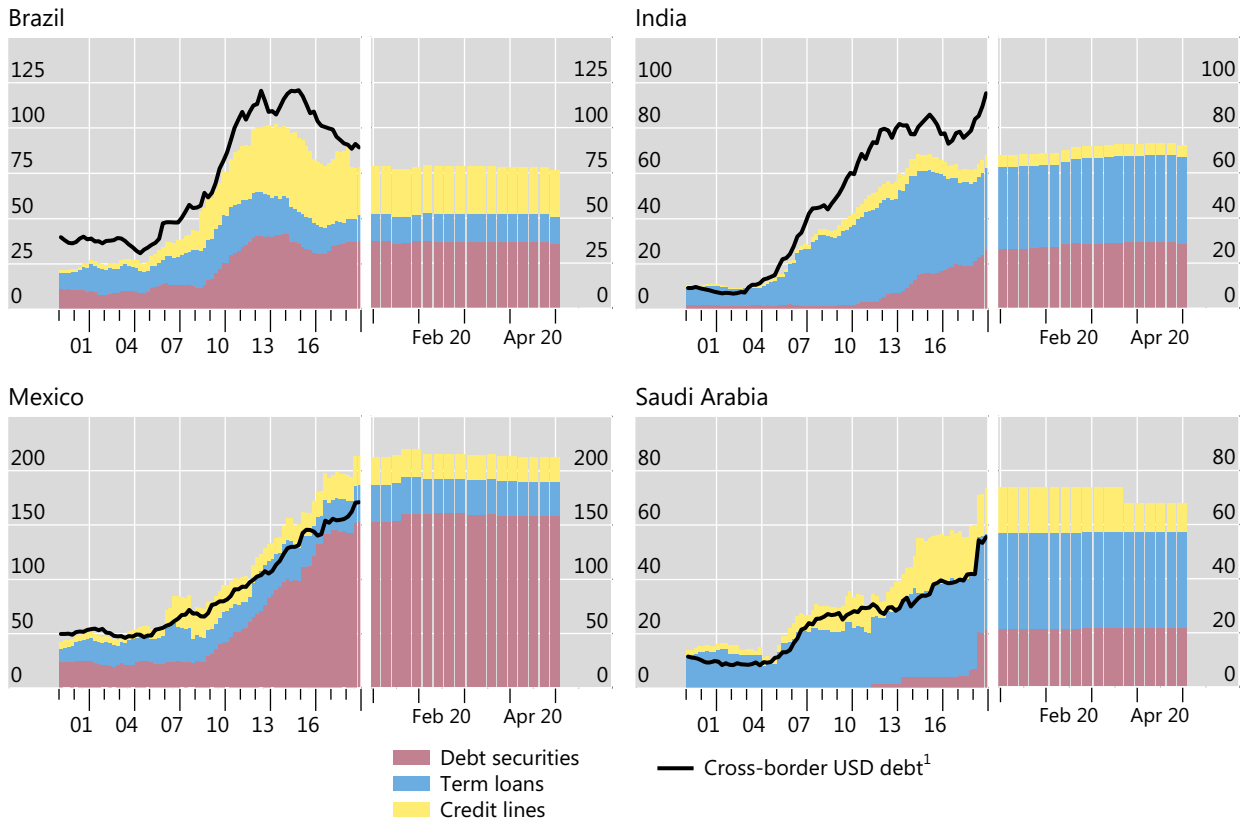
¹² The Dealogic data capture bonds and term loans as well as credit lines, although it is not known whether the credit lines have been drawn (and thus included in debt stocks) or remain untapped. The match between the two series is not perfect because some cross-border loans are not syndicated (and thus not captured in Dealogic data) and because of an imperfect overlap of the debt securities captured in Dealogic and in the BIS IDS statistics.

¹³ Graph 3 in the [Statistical Release](#) of the BIS international banking statistics at end-December 2019 shows a snapshot for key EMEs of the outstanding stock of foreign claims (guarantor basis) and the amount of undisbursed credit commitments. For most EMEs, the undisbursed credit commitments at end-2019 amounted to 10–15% of the outstanding stock of claims. Borrowers in Mexico even had undrawn credit lines worth \$70 billion, or 19% of foreign claims on Mexico.

US dollar cross-border credit to non-financial corporates

Amounts outstanding, in billions of US dollars

Graph 5



The left-hand panel for each country juxtaposes cross-border debt (black line) through to end-2019 with the stocks of outstanding bonds, syndicated loans and credit lines as tracked in Dealogic data. The data are presented at a quarterly frequency to show how well the Dealogic data track the BIS locational banking and international debt securities figures over the longer term. The right-hand panel extends the Dealogic data on a weekly basis through to end-April 2020.

¹ Estimates based on the sum of cross-border loans to non-financial corporates and outstanding international debt securities (see box).

Sources: Dealogic; Euroclear; Thomson Reuters; TRAX; BIS locational banking statistics.

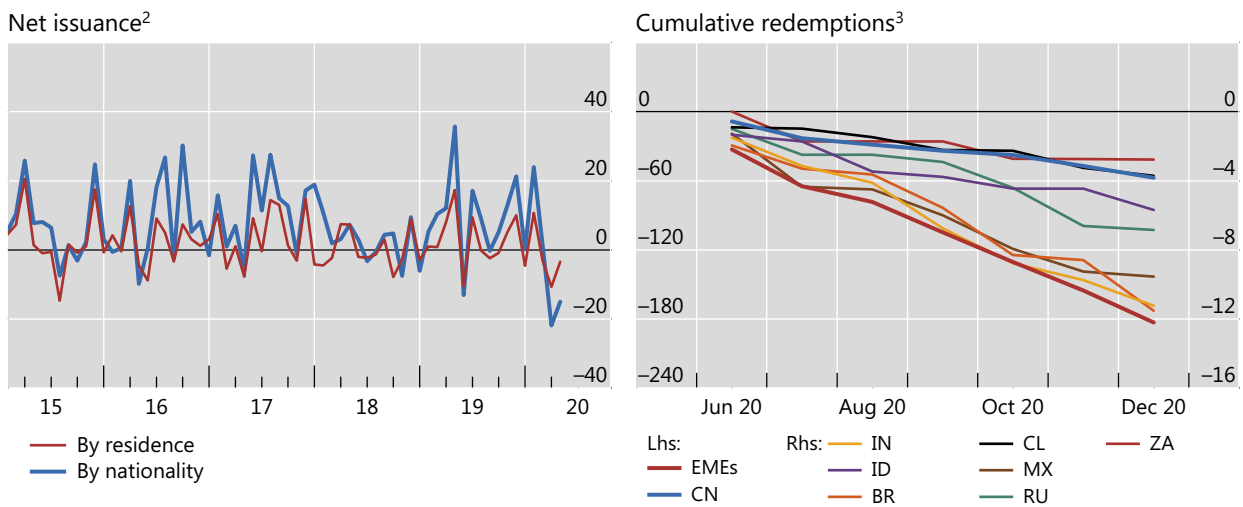
Several additional indicators, however, do show signs of a deterioration in financing conditions in EMEs (Graph 6). Net issuance of new dollar debt by EME NFCs plunged into negative territory after the pandemic went global (–\$14 billion during March and April). Compiling the debt stocks on a nationality basis (which includes the debt of domestic NFCs’ non-resident affiliates) shows an even sharper contraction: –\$37 billion in March and April, the largest bimonthly decline since the GFC (left-hand panel). Data from the Institute of International Finance (IIF) also point in the same direction.¹⁵ They reveal that, during the first three months of the Covid-19 stress period, portfolio debt outflows from the EMEs tracked by the IIF exceeded \$30 billion and were considerably larger than the respective outflows during the GFC.

¹⁵ The IIF data capture net transactions by non-residents (rather than new debt creation) and do not have sector or currency breakdowns. Nevertheless, they do give an indication of foreign investors’ treatment of NFCs’ dollar bonds, which are a large share of EMEs’ externally held bonds. See also Hofmann, Shim and Shin (2020) and Hördahl and Shim (2020).

EME NFCs' dollar debt in 2020¹

In billions of US dollars

Graph 6



¹ Figures are based on issues/redemptions of international bonds, syndicated term loans and credit lines. ² Monthly net issuance covering cross-border and local issuance through to end-April 2020. ³ By nationality of the borrower.

Source: Dealogic.

If financial conditions were to continue to deteriorate, many EME NFCs might have problems refinancing the portion of their dollar debt that is scheduled to mature over the next few months. For EMEs as a group, close to \$200 billion in dollar debt (or 8% of the end-2019 debt stock) will mature between June and December 2020 (Graph 6, right-hand panel). Across individual countries, corporates from China (\$57 billion, or 10% of the outstanding stock), Brazil (\$12 billion, 6%), India (\$11 billion, 9%) and Mexico (\$10 billion, 4%) will have the highest refinancing needs for the rest of the year.

Conclusion

The international dimensions of debt expose corporates and other borrowers to heightened funding risk when global markets become unsettled. External financing, particularly if short-term, can disappear when creditors get skittish. And foreign currency debt can be difficult to roll over when local currencies depreciate. Many of the EMEs examined in this feature, and many other countries around the world, are exporters of commodities, goods and services priced and traded in dollars. The associated dollar revenue has served as a natural hedge against currency mismatches. However, falling sales and commodity prices portend difficulties for NFCs in servicing their international debt. This debt bears watching as the pandemic's impact on the global economy continues to unfold.

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EME government debt: cause for concern?

Carlos Cantú, Tirupam Goel and Jochen Schanz^①

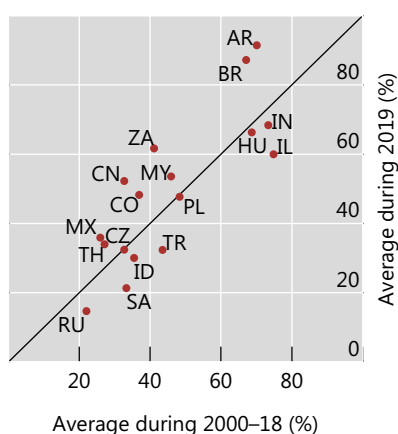
In emerging market economies (EMEs), the Covid-19 pandemic increased governments' funding needs at the very moment that investor appetite waned. In March, local currency bond yields rose rapidly and international investors withdrew on a massive scale. While government debt markets have since started to stabilise, the economic crisis triggered by the pandemic has brought into sharp focus two international dimensions of EME governments' funding risk: their vulnerability to currency depreciations and their dependence on non-resident portfolio investors.

Even before the crisis, government debt relative to GDP had risen in many EMEs over the previous two decades (Graph A1, left-hand panel). Some EMEs now have a stock of government debt to GDP as high as 70%. However, as interest rates fell over the same period, the debt service burden of those economies rose by less.

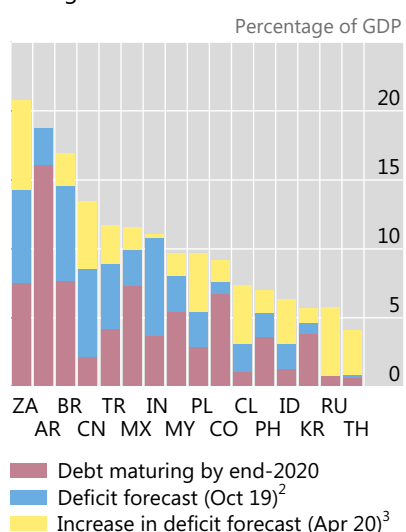
Refinancing needs surge amid high levels of indebtedness in some EMEs

Graph A1

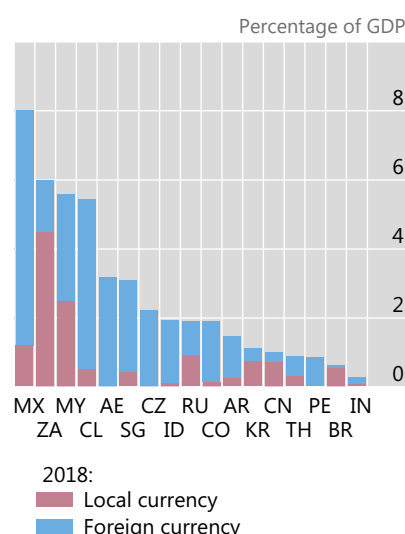
Government debt¹ to GDP has increased in most EMEs



Financing needs increase on the back of larger deficits



SOEs' bonds outstanding⁴



¹ General government. Nominal value of core debt (currency/deposits, loans and debt securities); assets and liabilities between government entities are netted. ² IMF estimates. ³ Includes fiscal relief packages announced in response to the Covid-19 outbreak as of early April 2020. Several countries have since announced more packages, which are not included. April 2020 budget deficit estimates are not available for Argentina. ⁴ Data of state-owned enterprises (SOEs) included in JPMorgan's CEMBI and EMBI indices.

Sources: IIF Global Debt database; IMF, *Fiscal Monitor*; S&P Capital IQ; BIS total credit statistics; authors' calculations.

Owing to the crisis, financing needs have increased for most EMEs. Several governments already had large annual refinancing needs in 2020 (Graph A1, centre panel). Fiscal expenditure is set to increase in all EMEs because of relief packages aimed at alleviating the economic fallout of virus containment measures. At the same time, revenues are expected to fall as economic activity declines. Commodity-producing EMEs are additionally hit by the decline in oil and other commodity prices in 2020.^② Across EMEs, the overall refinancing need in 2020 is expected to be around 10% of GDP on average, and up to 20% for some especially hard-hit countries (centre panel).

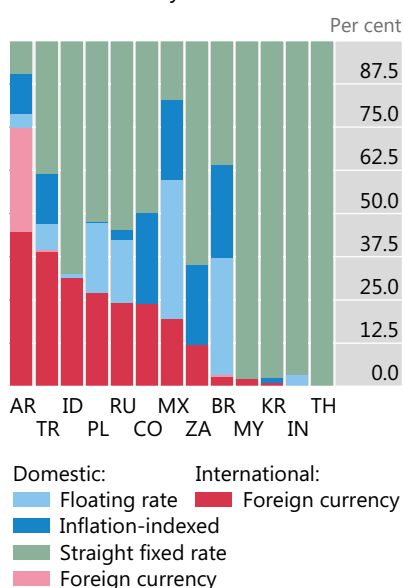
The crisis may also crystallise some contingent liabilities for governments, particularly in relation to state-owned enterprises (SOEs). In some EMEs, SOEs outside the general government sector have high debt levels (Graph A1, right-hand panel), including liabilities incurred by their affiliates abroad. The weak profitability of some of these SOEs makes their liabilities more likely to fall on government balance sheets. Indeed, already prior to the crisis, direct transfers to SOEs were weighing on budgets in some countries (eg Mexico and South Africa).

Against this backdrop, two aspects of the external funding structure of government debt are of potential concern. The first concern is the currency composition of EME debt. Most EME governments have reduced their exposure to currency devaluations by developing their local currency government bond (LCGB) markets.^③ At end-2019, around 80% of central government bonds were denominated in local currency, mostly at fixed rates (Graph A2, left-hand panel). However, a few EMEs still have a substantial share of their bonds denominated in foreign currencies and thus

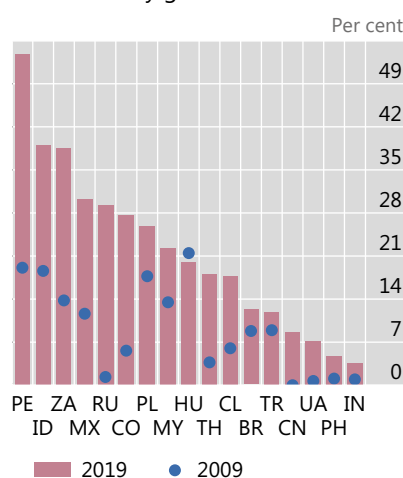
Small share of FX debt, yet foreign ownership is high for some EMEs

Graph A2

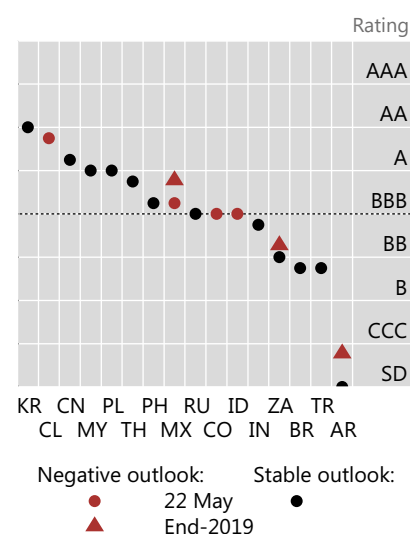
Most central government bonds are in local currency¹



Non-residents own a large share of local currency government bonds²



Sovereign debt ratings³



¹ Based on amounts outstanding at end-2018. Domestic bonds exclude money market instruments. International bonds are typically issued in foreign currency; some countries, such as Argentina, also issue foreign currency debt domestically. ² Central government bonds. ³ The dashed line indicates the investment grade threshold. For Argentina, the rating outlook as of 22 May is "not meaningful".

Sources: S Arslanalp and T Tsuda, "Tracking global demand for emerging market sovereign debt", *IMF Working Papers*, no WP/14/39, March 2014; Bloomberg; Dealogic; Euroclear; S&P Capital IQ; Thomson Reuters; Xtrakter Ltd; national data; BIS calculations.

remain vulnerable to valuation changes linked to exchange rate depreciation. In addition, SOEs' liabilities can be sensitive to currency devaluations when they have substantial amounts of foreign currency-denominated debt and face a decline in their foreign currency incomes. For example, about 90% of the debt of the oil-producing SOEs of Brazil, Colombia and Mexico is denominated in US dollars. The collapse in commodity prices is now weighing on the financial position of SOEs that have relied on income from commodity sales as a "natural hedge" to service their foreign currency debt.^④

The second potential concern is the challenges posed by the participation of foreign investors in LCGB markets. As of mid-2019, non-residents held about 20% of the LCGBs (Graph A2, centre panel), up from 10% a decade ago. Increased foreign participation has many advantages when the domestic institutional investor base is less developed. It provides funding and adds to the liquidity of domestic government bond markets. It has also helped EMEs to reduce short-term foreign currency borrowing, a key driver of past crises. Yet foreign portfolio investment does not fully insulate EMEs from funding strains.^⑤ A large increase in domestic currency bond yields often coincides with currency depreciation. The two can combine to raise EME governments' funding costs. In addition, large market moves can trigger unhedged foreign investors' risk limits, leading to asset sales or more hedging. These adverse dynamics have played out in recent months.^⑥

A potential rating downgrade is another structural vulnerability for several EMEs (Graph A2, right-hand panel). As of late May 2020, several large EMEs were borderline investment grade. A downgrade below investment grade could reduce the pool of potential investors, forcing some to sell their security holdings if they, for instance, have investment grade mandates or match investment grade indices. This cliff effect risks a severe market disruption.

① The views expressed are those of the authors and do not necessarily reflect the views of the Bank for International Settlements. ② The Mexican government has a hedging programme in place to protect public finances from oil price fluctuations. ③ See K Micic, "Recent trends in EME government debt volume and composition", *BIS Quarterly Review*, September 2017, pp 22–4. ④ See A Aguilar, V Alfonso, R Barbone and C Cantú, "Oil dependence in Latin America", *BIS Bulletin*, forthcoming. ⑤ "Original sin redux" is the term coined to describe the risks associated with non-resident ownership of LCGBs; see A Carstens and H S Shin, "Emerging markets aren't out of the woods yet", *Foreign Affairs*, 15 March 2019. ⑥ See B Hofmann, I Shim and H S Shin, "Emerging market economy exchange rates and local currency bond markets amid the Covid-19 pandemic", *BIS Bulletin*, no 5, April 2020; and P Hördahl and I Shim, "EME bond portfolio flows and long-term interest rates during the Covid-19 pandemic", *BIS Bulletin*, no 18, May 2020.

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). 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). A release calendar provides advance notice of publication dates (www.bis.org/statistics/relcal.htm).

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G Debt service ratios for the private non-financial sector

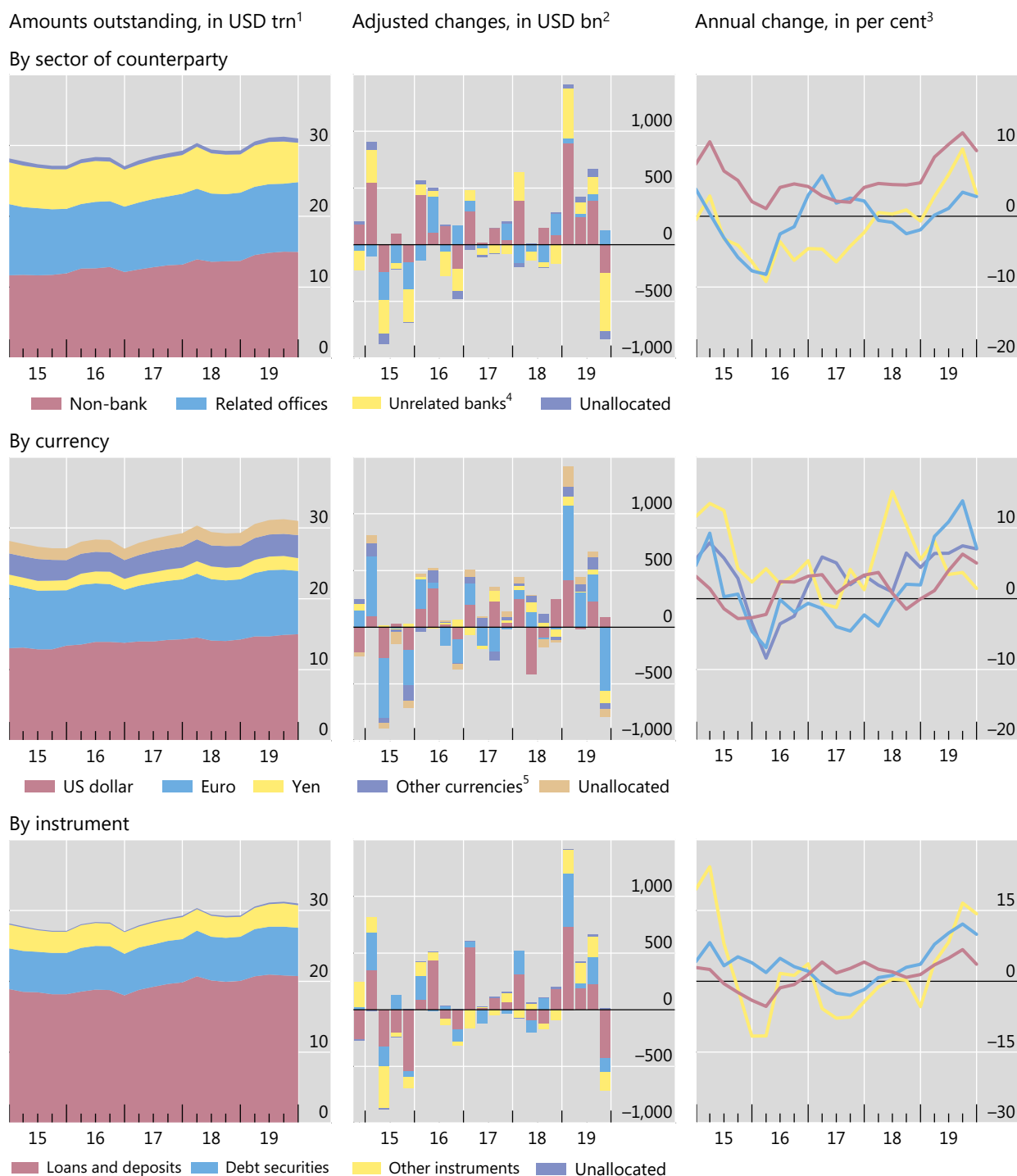
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A Locational banking statistics

Cross-border claims, by sector, currency and instrument

Graph A.1



Further information on the BIS locational banking statistics is available at www.bis.org/statistics/bankstats.htm.

¹ 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. ² Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. ³ Geometric mean of quarterly percentage adjusted changes. ⁴ Includes central banks and banks unallocated by subsector between intragroup and unrelated banks. ⁵ 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

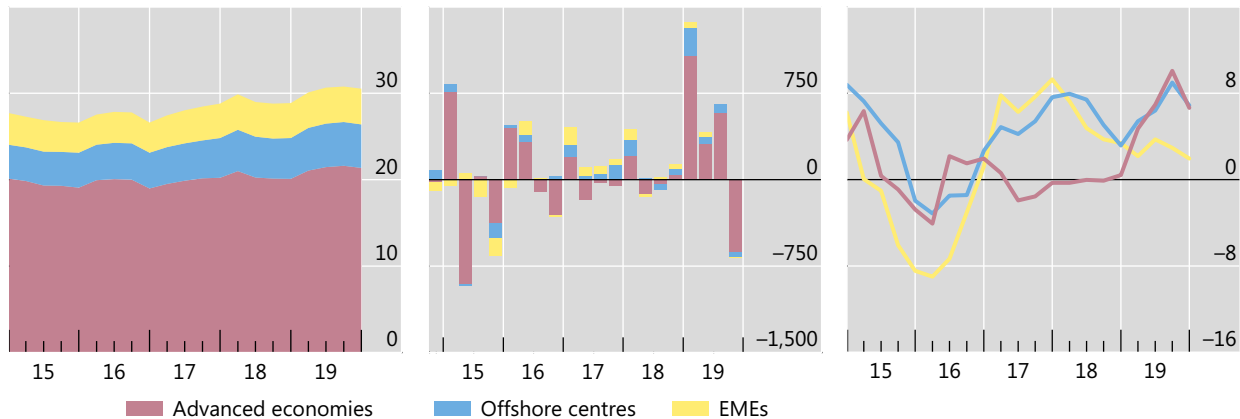
Graph A.2

Amounts outstanding, in USD trn¹

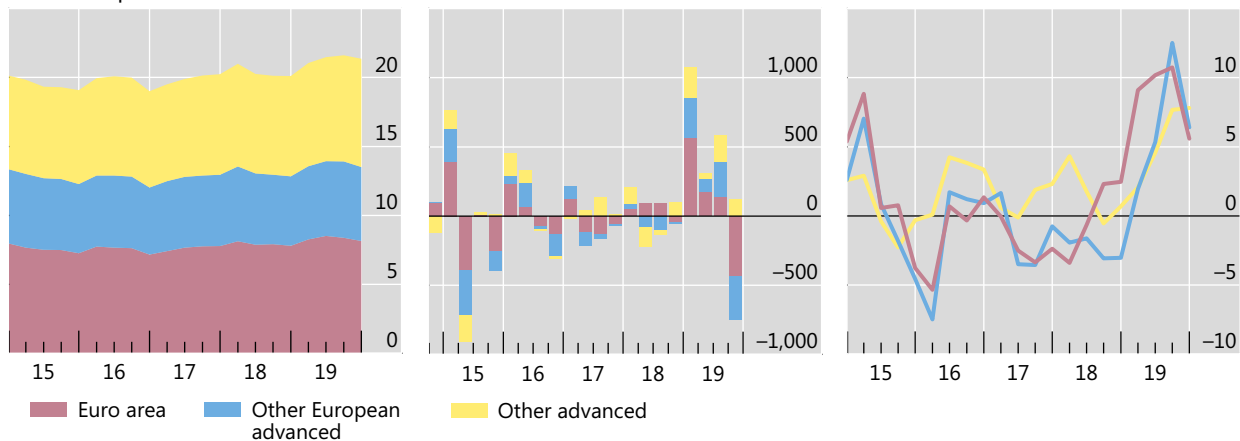
Adjusted changes, in USD bn²

Annual change, in per cent³

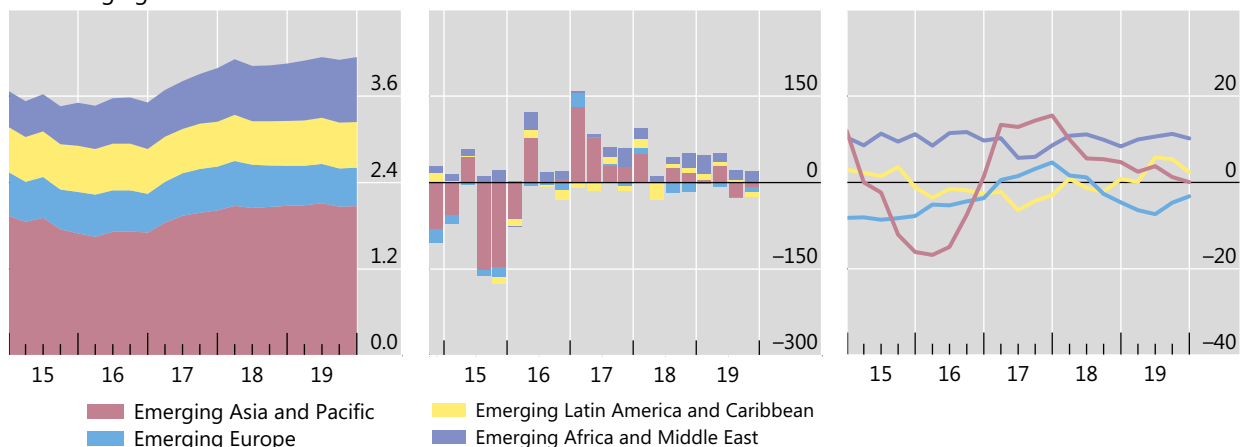
On all countries



On developed countries



On emerging market economies



Further information on the BIS locational banking statistics is available at www.bis.org/statistics/bankstats.htm.

¹ 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. ² Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. ³ Geometric mean of quarterly percentage adjusted changes.

Source: BIS locational banking statistics.

Cross-border claims, by borrowing country

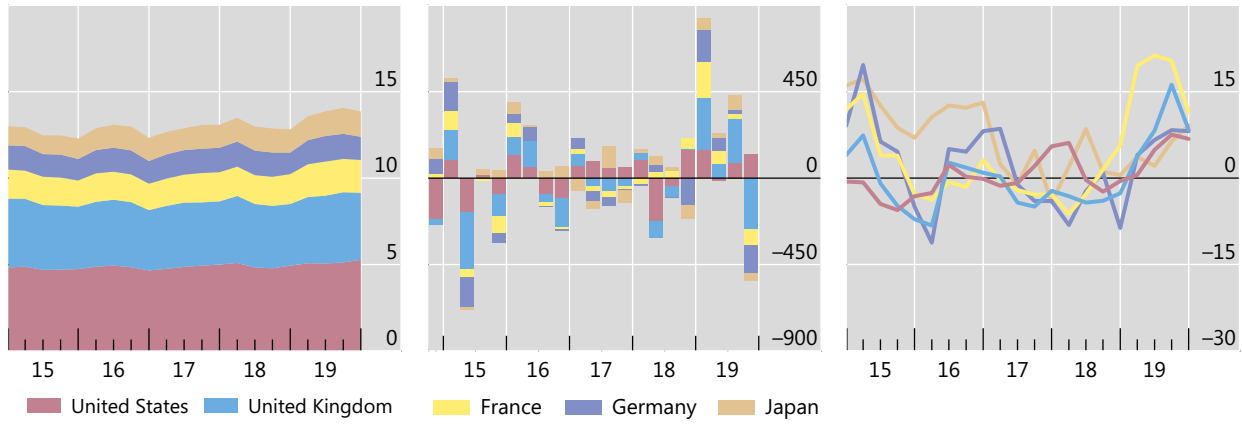
Graph A.3

Amounts outstanding, in USD trn¹

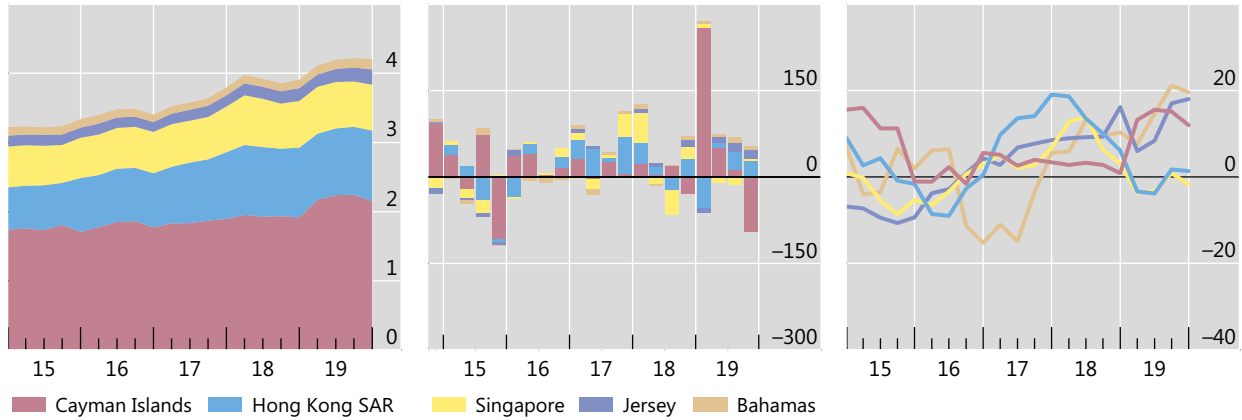
Adjusted changes, in USD bn²

Annual change, in per cent³

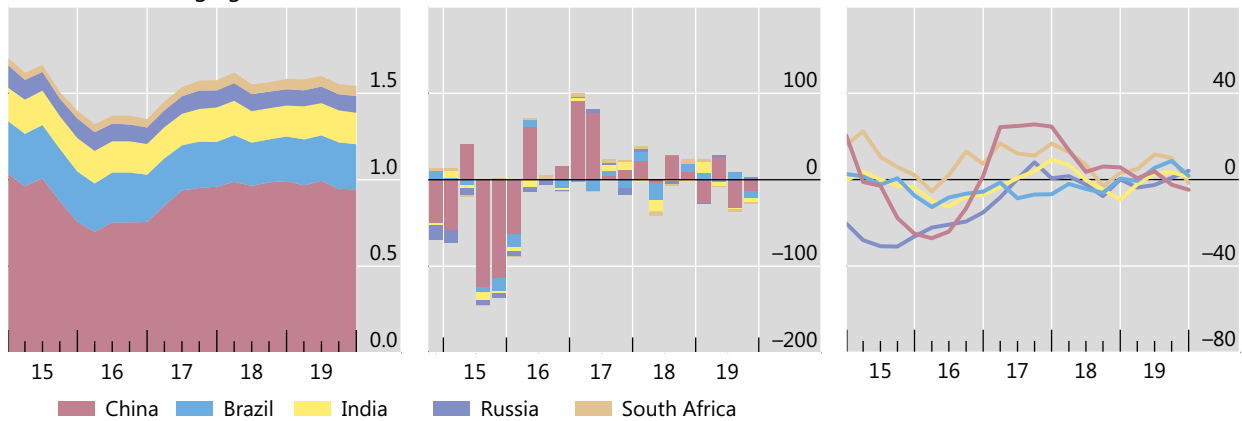
On selected advanced economies



On selected offshore centres



On selected emerging market economies

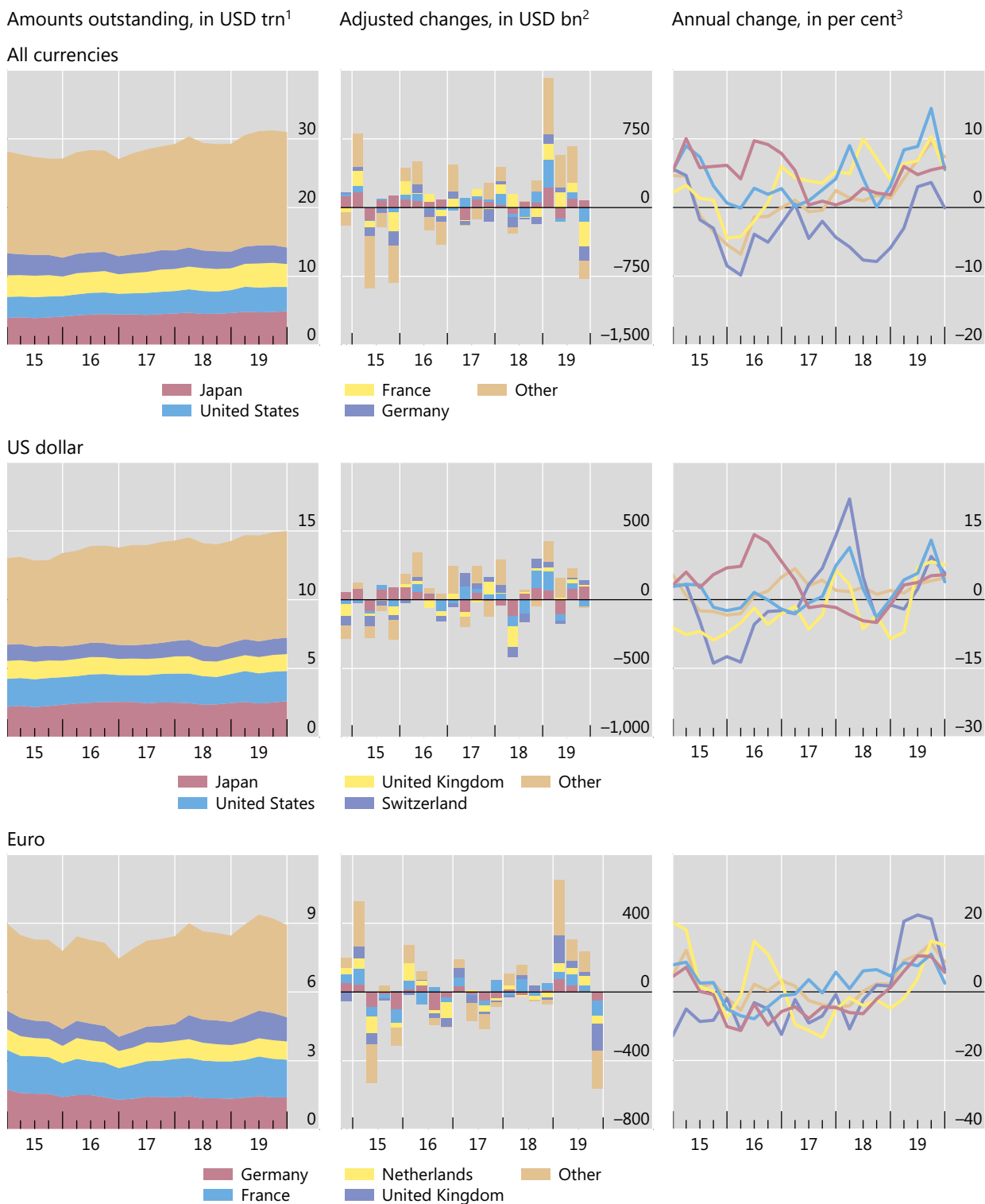


Further information on the BIS locational banking statistics is available at www.bis.org/statistics/bankstats.htm.

¹ 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. ² Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. ³ 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.

¹ 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. ² Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. ³ Geometric mean of quarterly percentage adjusted changes.

Source: BIS locational banking statistics.

Cross-border liabilities of reporting banks

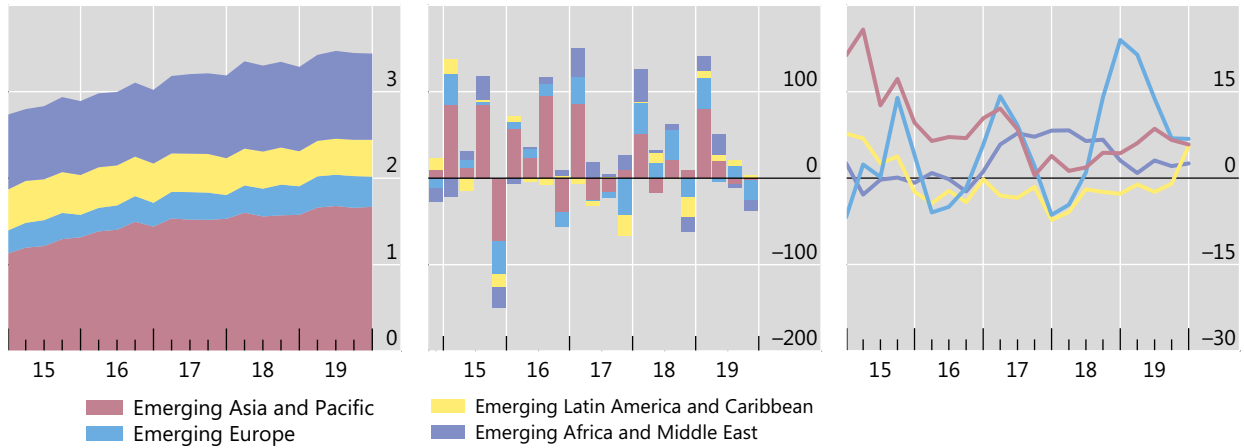
Graph A.5

Amounts outstanding, in USD trn¹

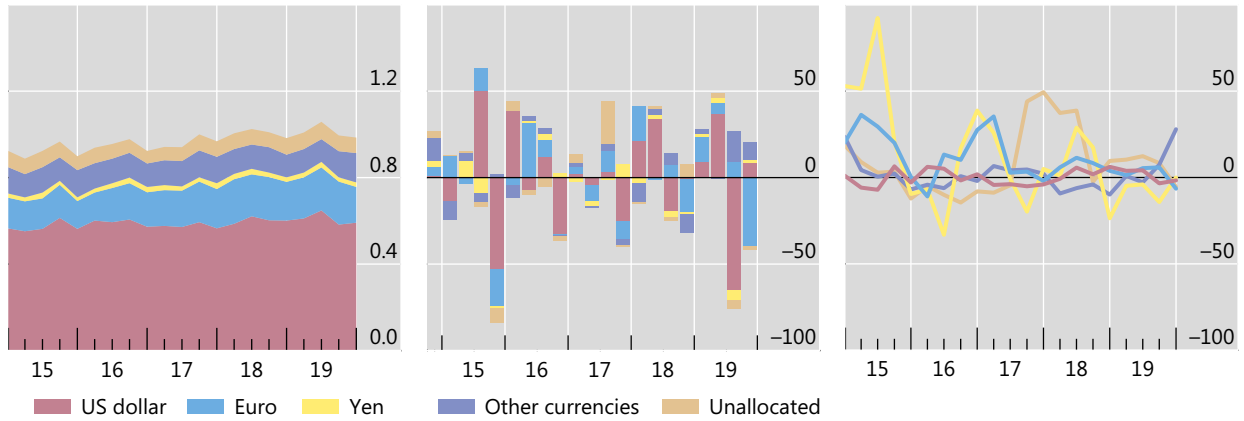
Adjusted changes, in USD bn²

Annual change, in per cent³

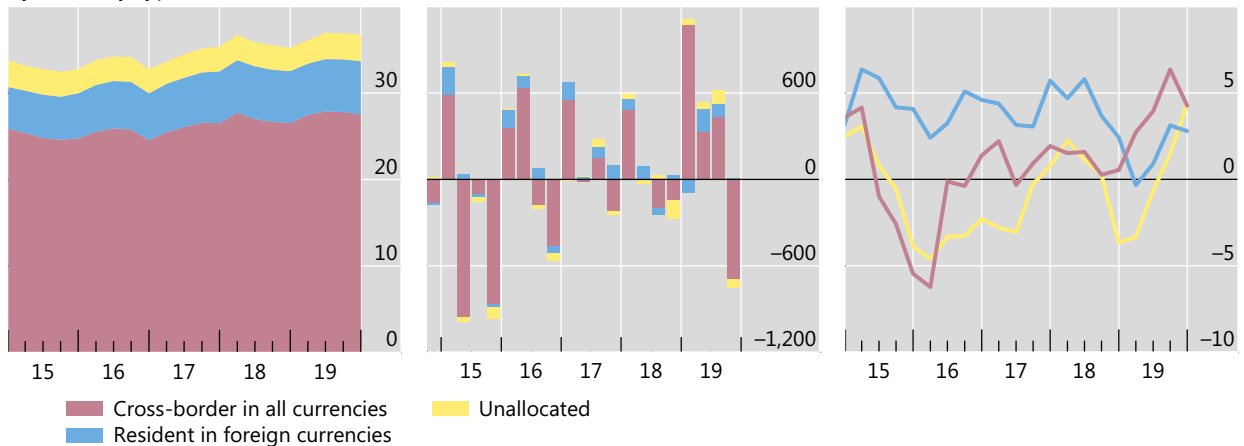
To emerging market economies



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.

¹ 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. ² Quarterly changes in amounts outstanding, adjusted for the impact of exchange rate movements between quarter-ends and methodological breaks in the data. ³ Geometric mean of quarterly percentage adjusted changes.

Source: BIS locational banking statistics.

B Consolidated banking statistics

Consolidated claims of reporting banks on advanced economies

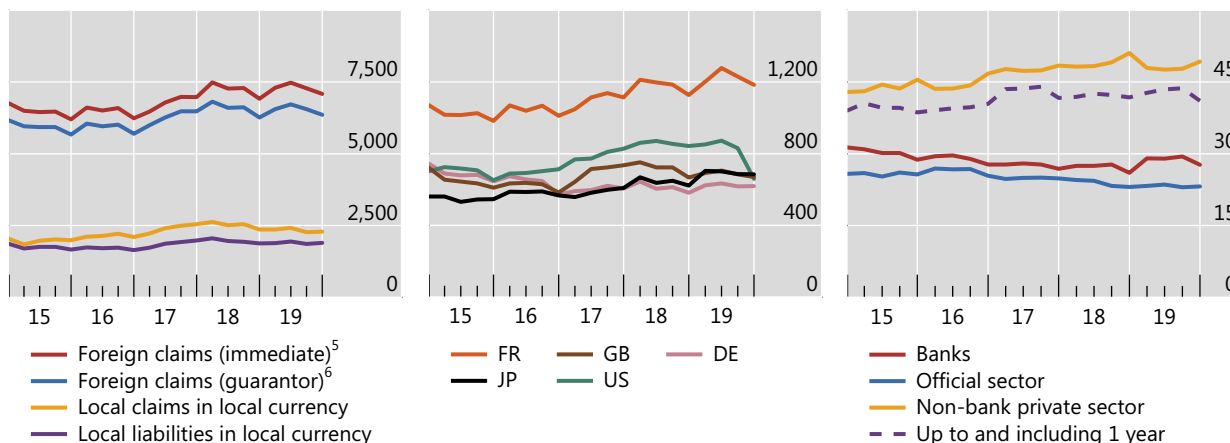
Graph B.1

Foreign claims and local positions, in USD bn^{1,2}

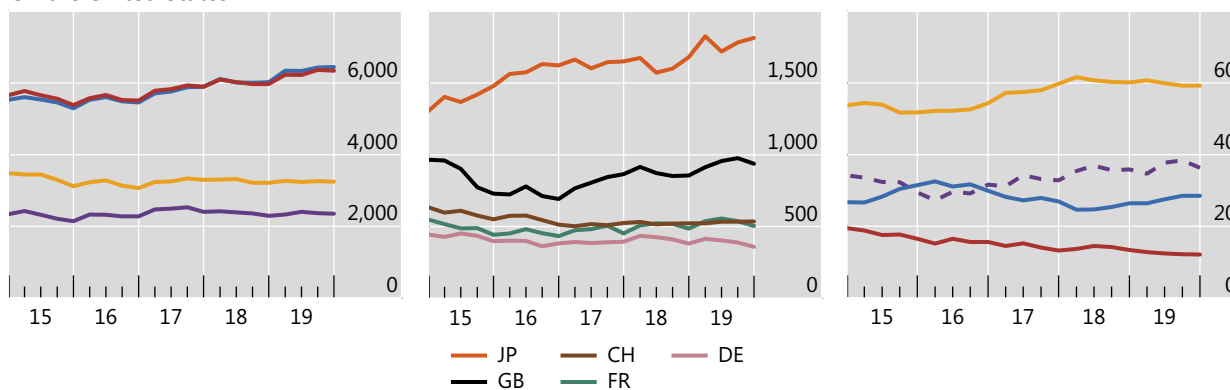
Foreign claims of selected creditors, in USD bn^{1,3}

International claims, by sector and maturity, in per cent⁴

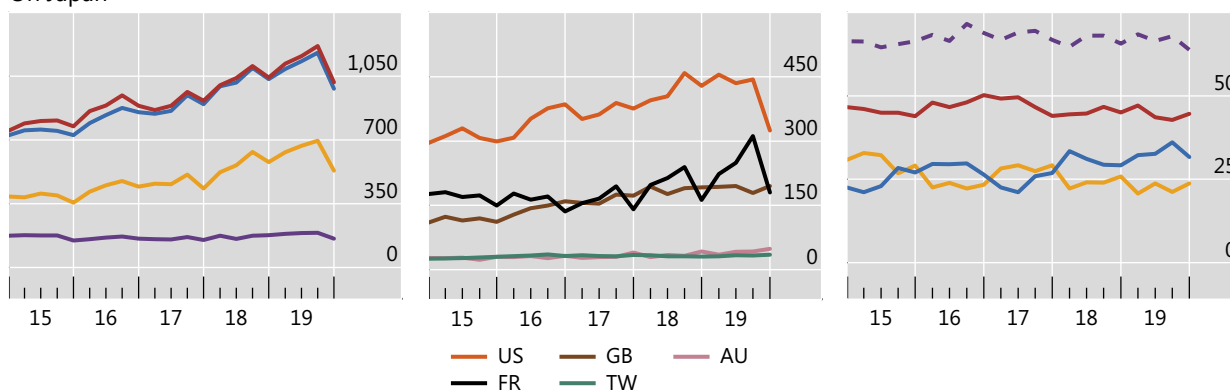
On the euro area



On the United States



On Japan



Further information on the BIS consolidated banking statistics is available at www.bis.org/statistics/bankstats.htm.

¹ 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. ² Excludes domestic claims, ie claims on residents of a bank's home country. ³ Foreign claims on a guarantor basis, by nationality of reporting bank. The banking systems shown are not necessarily the largest foreign bank creditors on each reference date. ⁴ As a percentage of international claims outstanding. ⁵ On an immediate counterparty basis. Includes the unconsolidated claims of banks headquartered outside but located inside CBS-reporting countries. ⁶ On a guarantor basis.

Source: BIS consolidated banking statistics (CBS).

Consolidated claims of reporting banks on emerging market economies

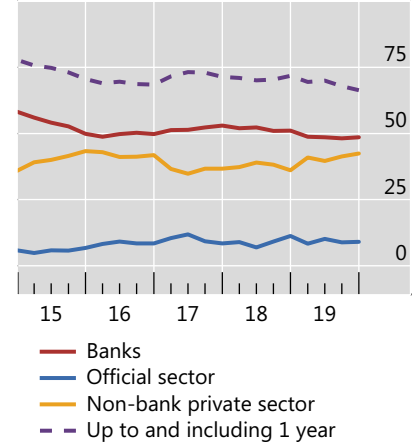
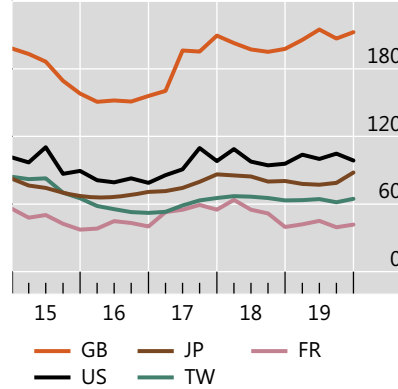
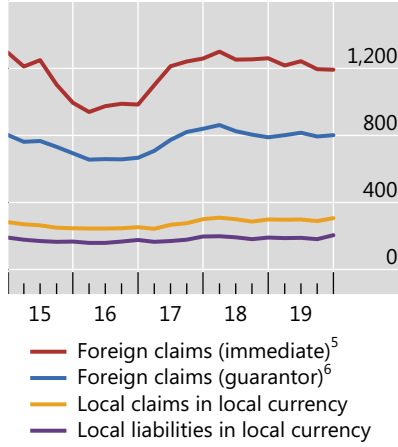
Graph B.2

Foreign claims and local positions, in USD bn^{1,2}

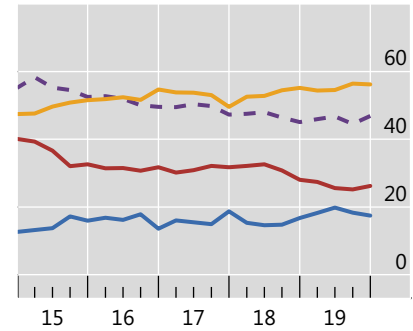
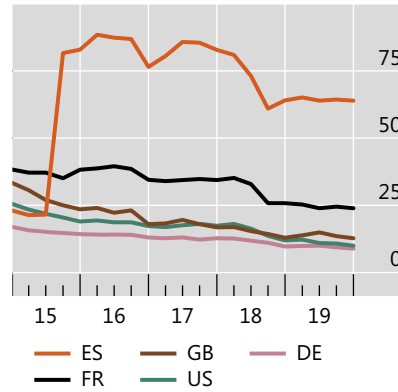
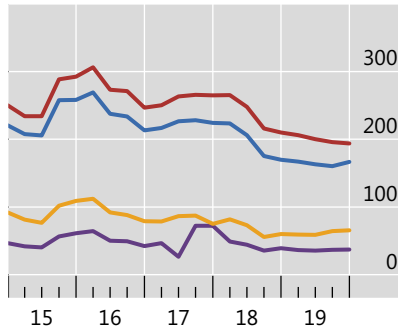
Foreign claims of selected creditors, in USD bn^{1,3}

International claims, by sector and maturity, in per cent⁴

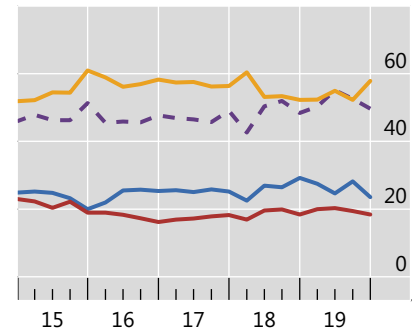
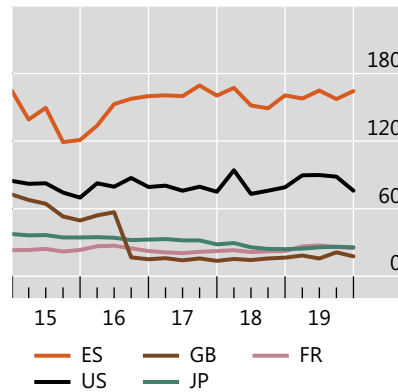
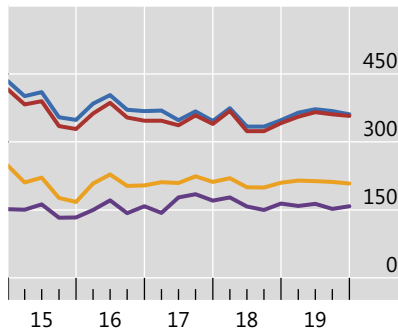
On China



On Turkey



On Brazil



Further information on the BIS consolidated banking statistics is available at www.bis.org/statistics/bankstats.htm.

¹ 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. ² Excludes domestic claims, ie claims on residents of a bank's home country. ³ Foreign claims on a guarantor basis, by nationality of reporting bank. The banking systems shown are not necessarily the largest foreign bank creditors on each reference date. ⁴ As a percentage of international claims. ⁵ On an immediate counterparty basis. Includes the unconsolidated claims of banks headquartered outside but located inside CBS-reporting countries. ⁶ On a guarantor basis.

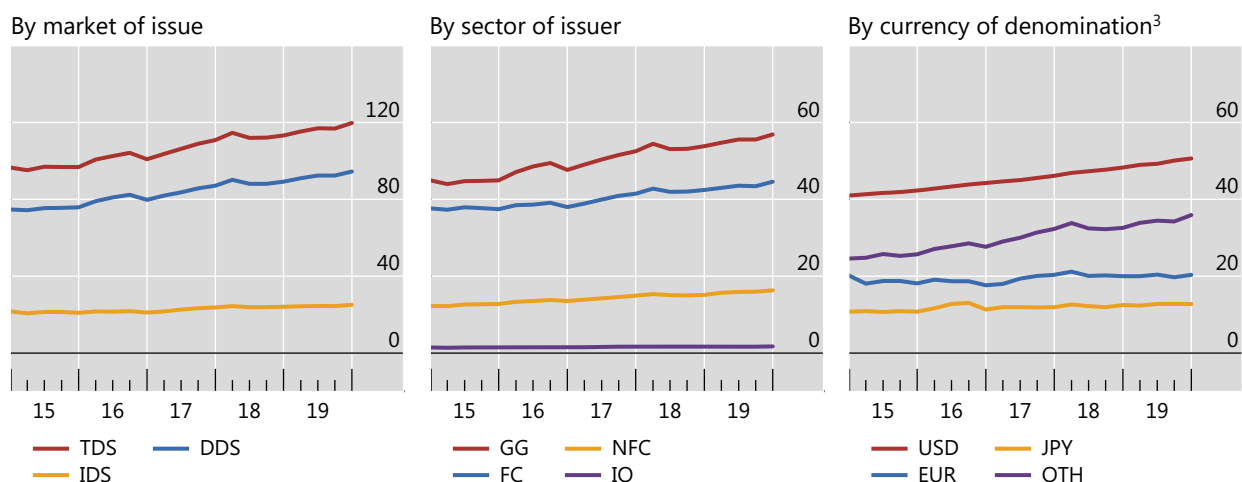
Source: BIS consolidated banking statistics (CBS).

C Debt securities statistics

Global debt securities markets¹

Amounts outstanding, in trillions of US dollars²

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.

Further information on the BIS debt securities statistics is available at www.bis.org/statistics/secstats.htm.

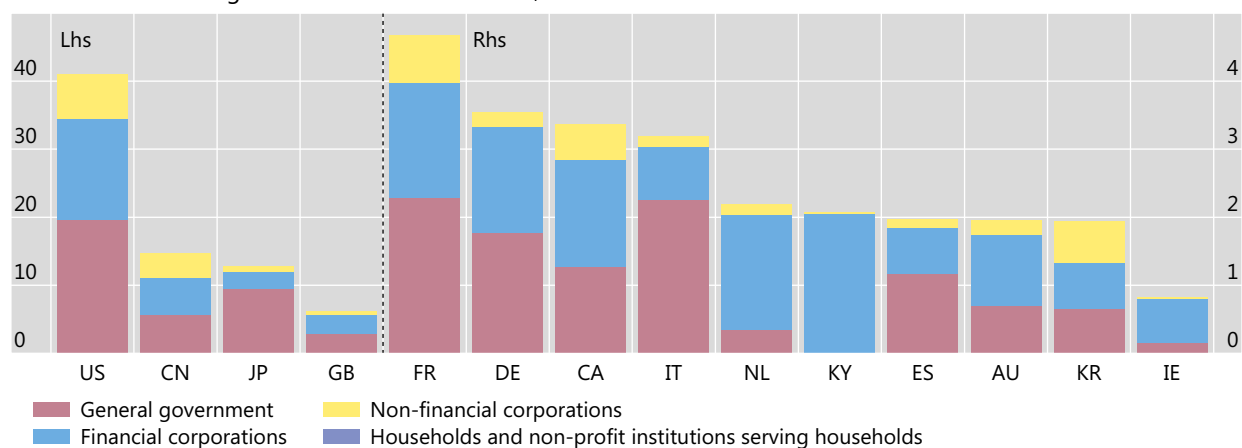
¹ Sample of countries varies across breakdowns shown. For countries that do not report TDS, data are estimated by the BIS as DDS plus IDS. For countries that do not report either TDS or DDS, data are estimated by the BIS as IDS. ² At quarter-end. Amounts denominated in currencies other than the US dollar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

Sources: Dealogic; Euroclear; Refinitiv; Xtrakter Ltd; national data; BIS debt securities statistics; BIS calculations.

Total debt securities, by residence and sector of issuer¹

Amounts outstanding for the latest available data, in trillions of US dollars²

Graph C.2



Further information on the BIS debt securities statistics is available at www.bis.org/statistics/secstats.htm.

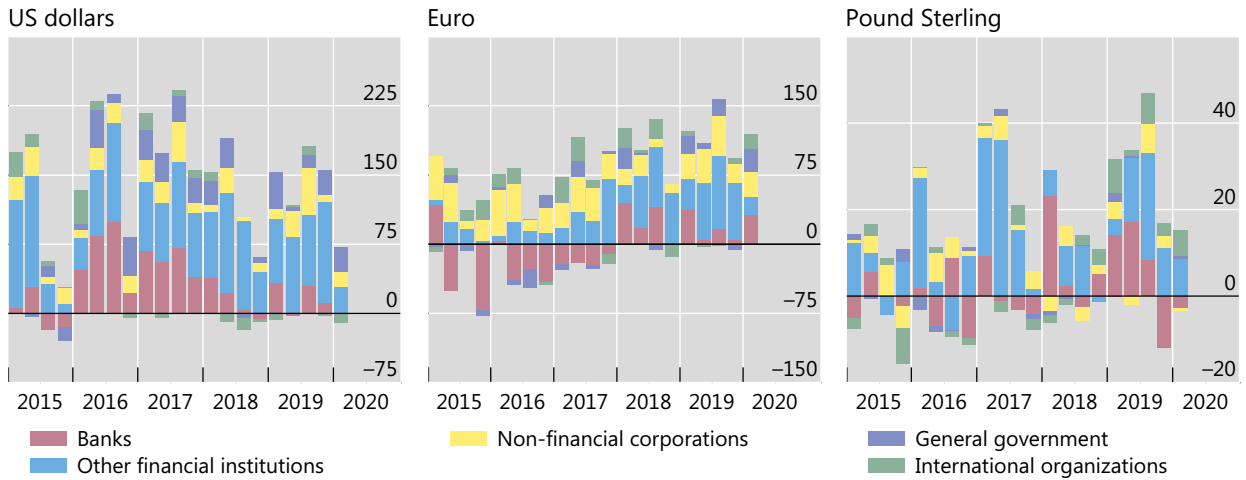
¹ For countries that do not report TDS, data are estimated by the BIS as DDS plus IDS. ² Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Sources: National data; BIS debt securities statistics.

Net issuance of international debt securities

By issuer sector and currency of denomination, in billions of US dollars

Graph C.3



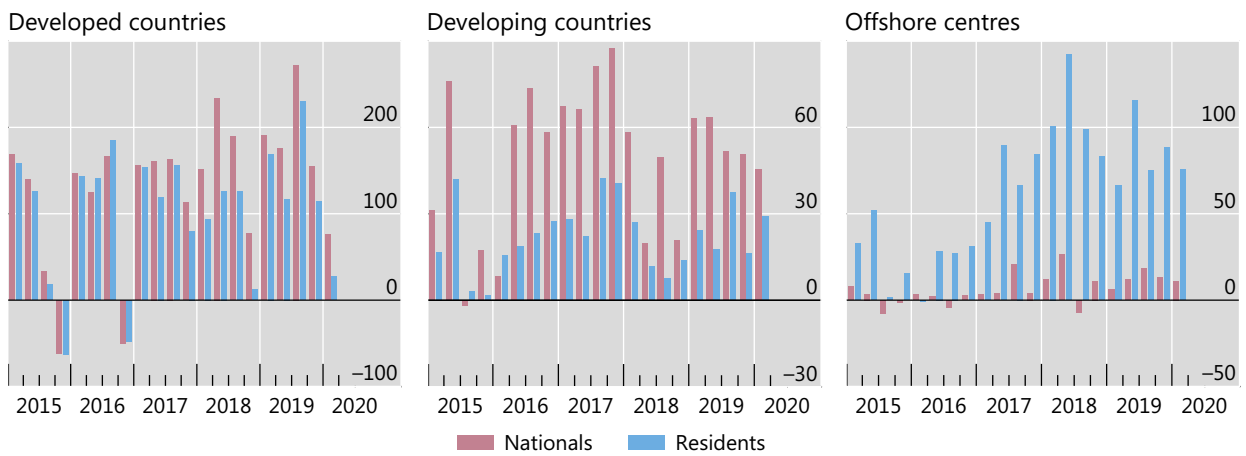
Further information is available at www.bis.org/statistics/secstats.htm.

Sources: Dealogic; Euroclear; Refinitiv; Xtrakter Ltd; BIS debt securities statistics.

International debt securities issued by financial and non-financial corporations¹

Net issuance by region, in billions of US dollars²

Graph C.4



Further information is available at www.bis.org/statistics/secstats.htm.

¹ Excluding general government. ² For a list of countries in each region, see Table C1 (<http://stats.bis.org/statx/srs/table/c1>).

Sources: Dealogic; Euroclear; Refinitiv; Xtrakter Ltd; BIS debt securities statistics.

D Derivatives statistics

Exchange-traded derivatives

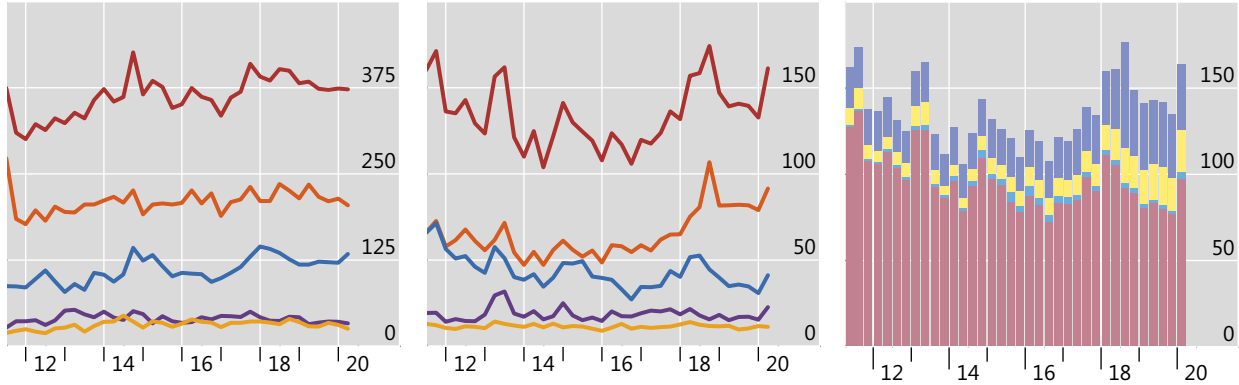
Graph D.1

Open interest, by currency¹

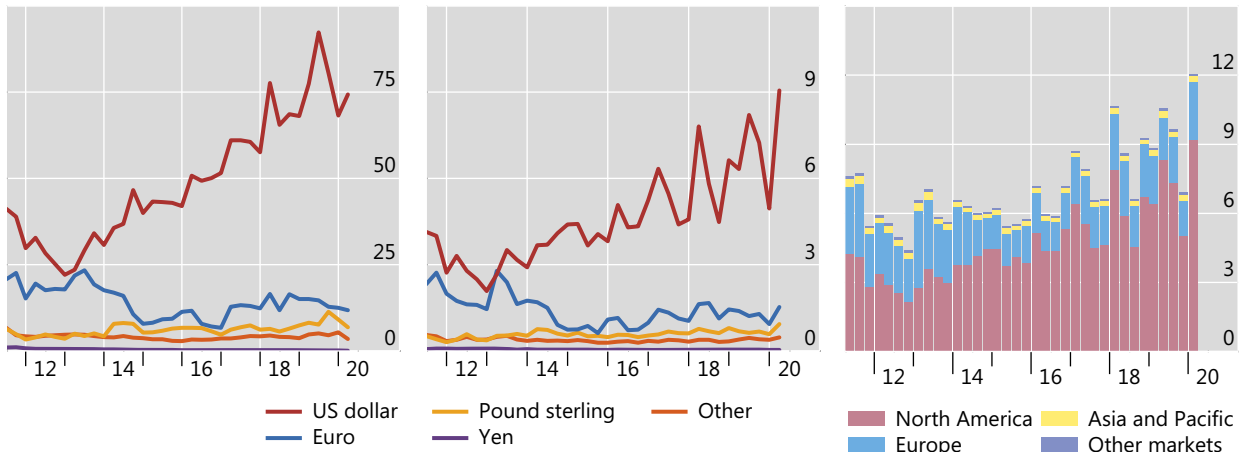
Daily average turnover, by currency²

Daily average turnover, by location of exchange²

Foreign exchange derivatives, USD bn³



Interest rate derivatives, USD trn³



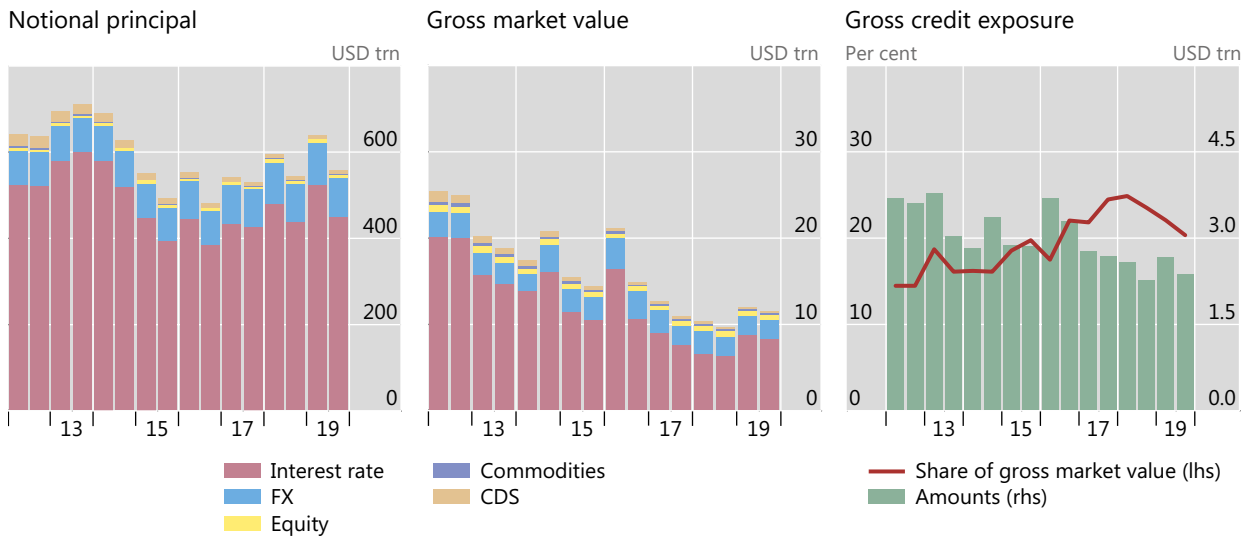
Further information on the BIS derivatives statistics is available at www.bis.org/statistics/extderiv.htm. For definitions, see the [online glossary](#).

¹ 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. ² Quarterly averages of daily turnover. ³ Futures and options.

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

Global OTC derivatives markets¹

Graph D.2



Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the online glossary.

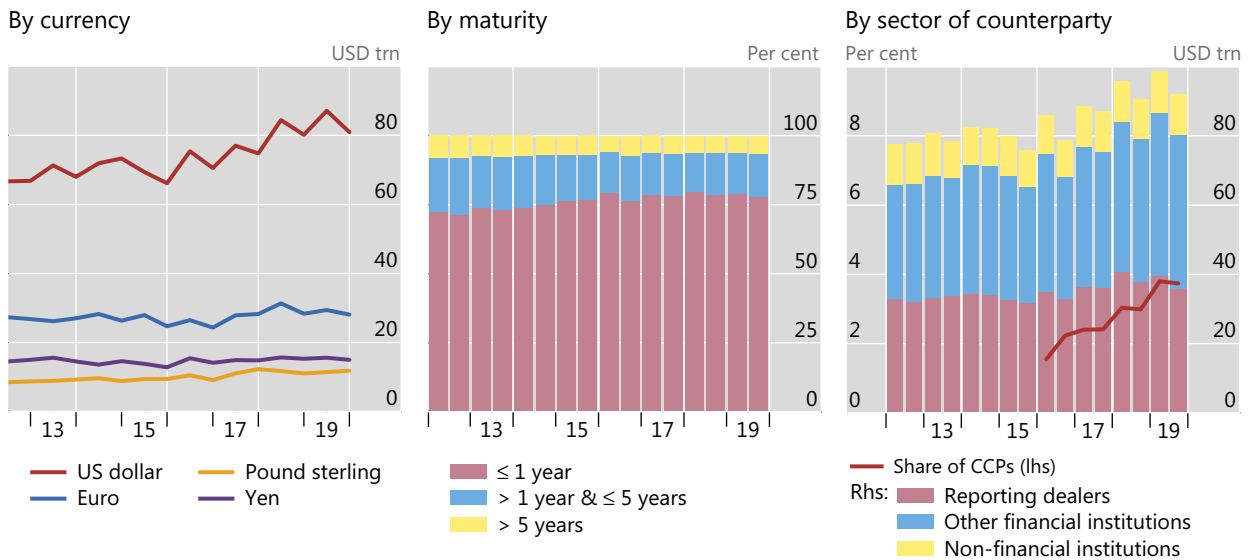
¹ At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

OTC foreign exchange derivatives

Notional principal¹

Graph D.3



Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the online glossary.

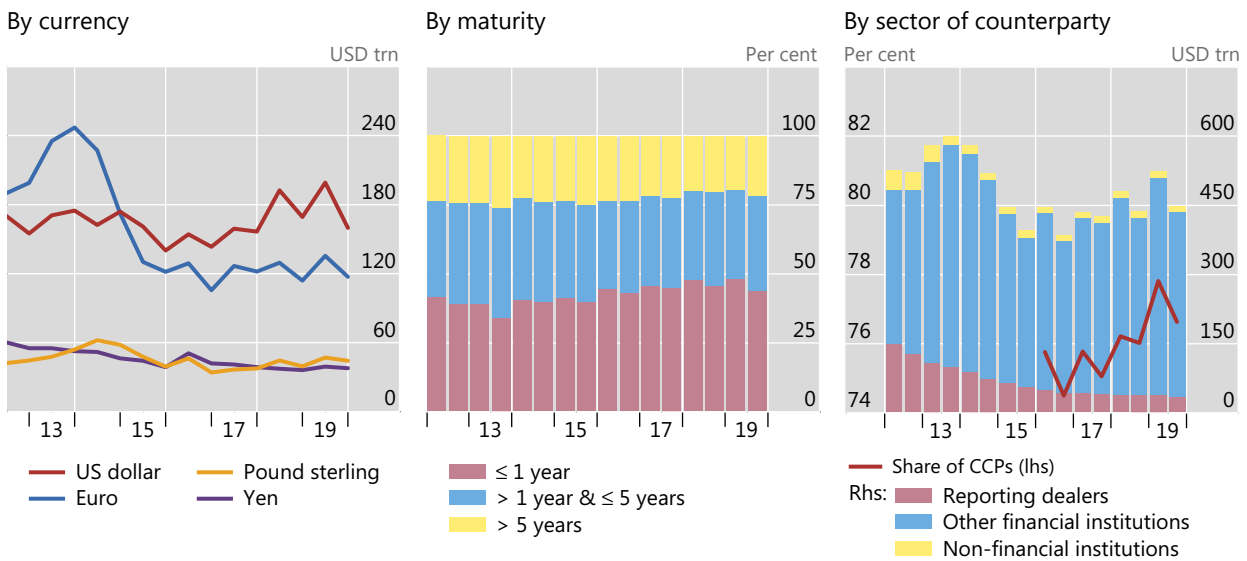
¹ At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

OTC interest rate derivatives

Notional principal¹

Graph D.4



Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the [online glossary](#).

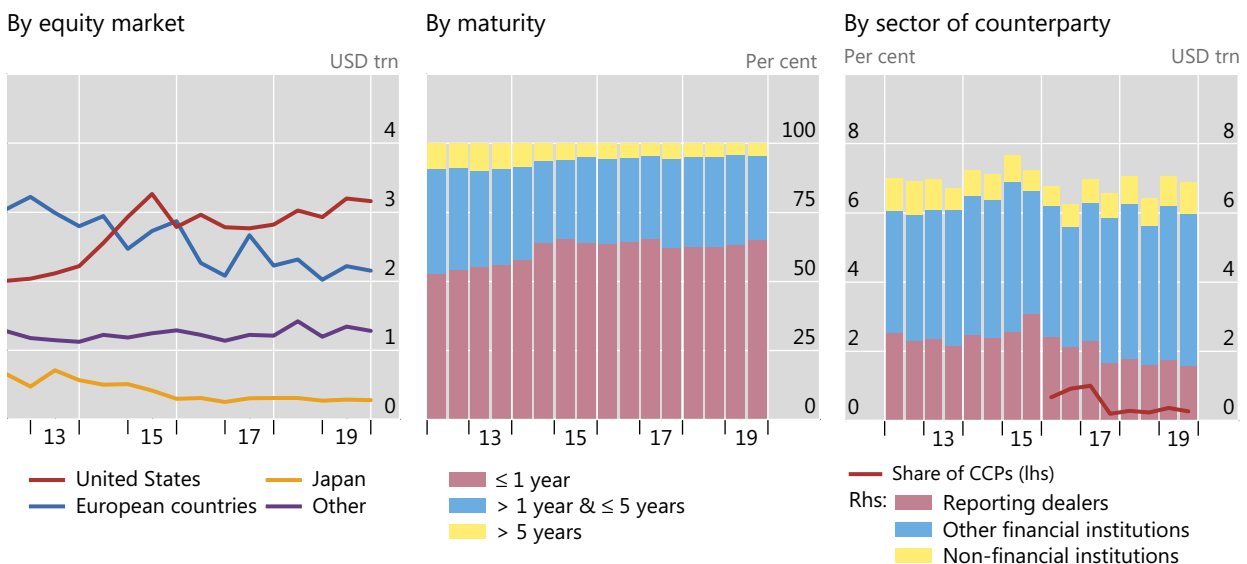
¹ At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

OTC equity-linked derivatives

Notional principal¹

Graph D.5



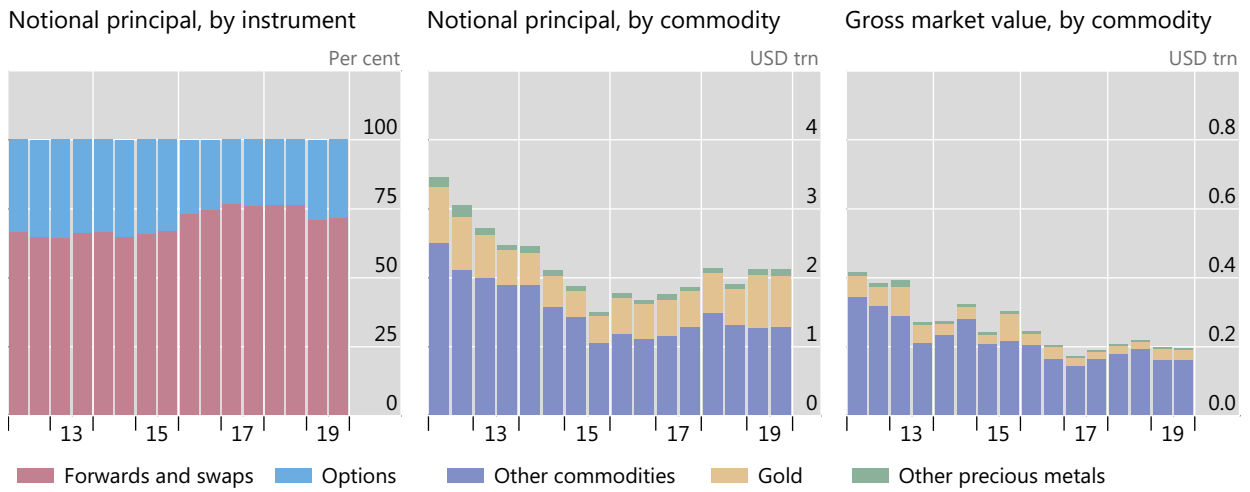
Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the [online glossary](#).

¹ 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 derivatives¹

Graph D.6



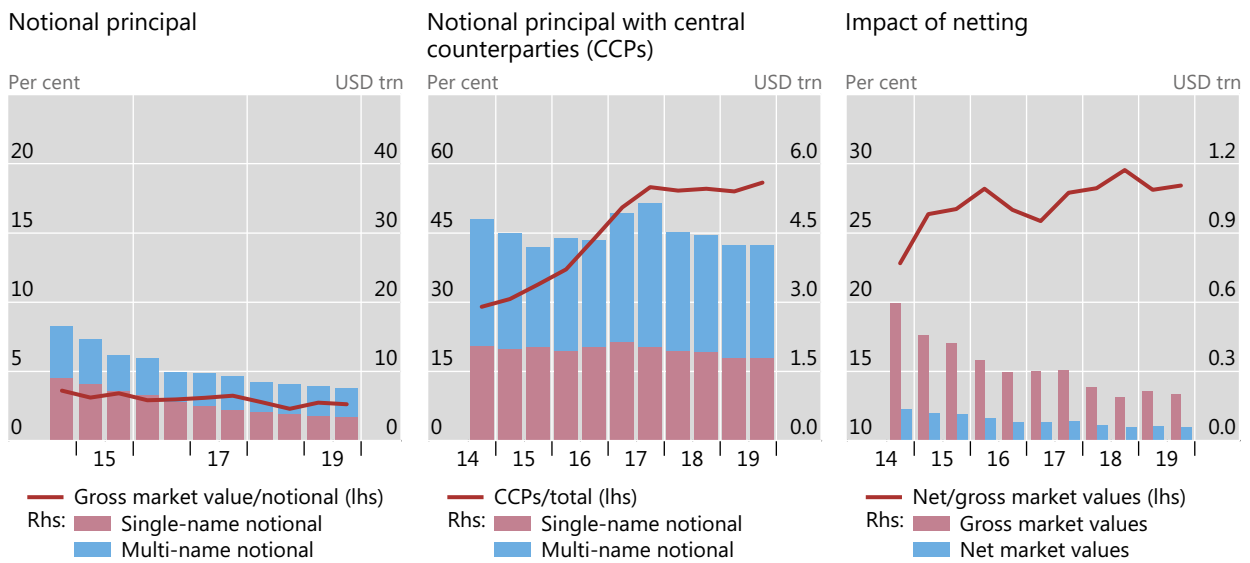
Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the online glossary.

¹ 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 swaps¹

Graph D.7



Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the online glossary.

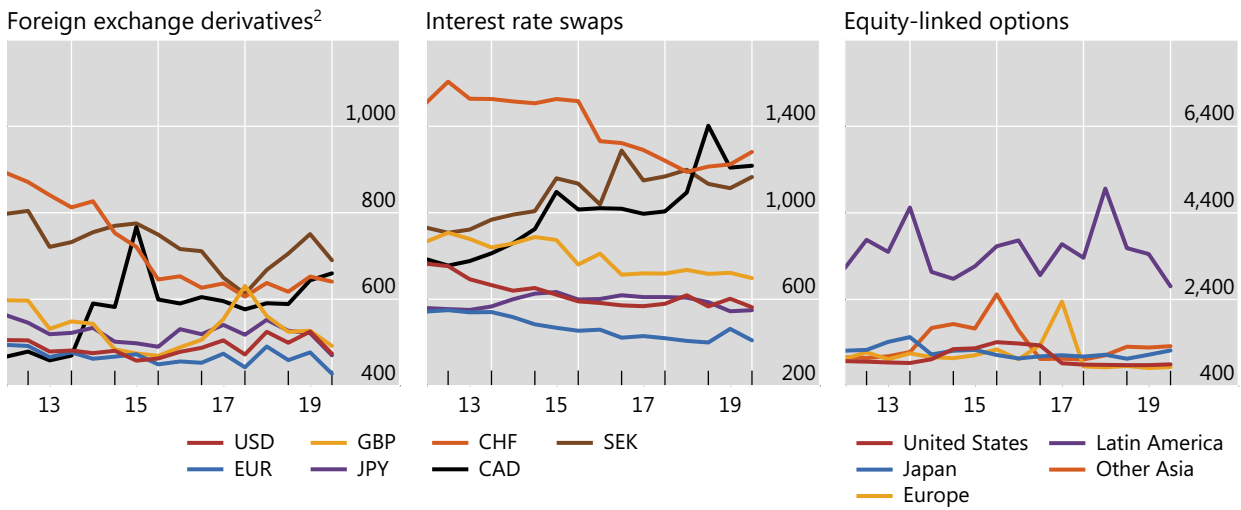
¹ At half-year end (end-June and end-December). Amounts denominated in currencies other than the US dollar are converted to US dollars at the exchange rate prevailing on the reference date.

Source: BIS derivatives statistics.

Concentration in global OTC derivatives markets

Herfindahl index¹

Graph D.8



Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the [online glossary](#).

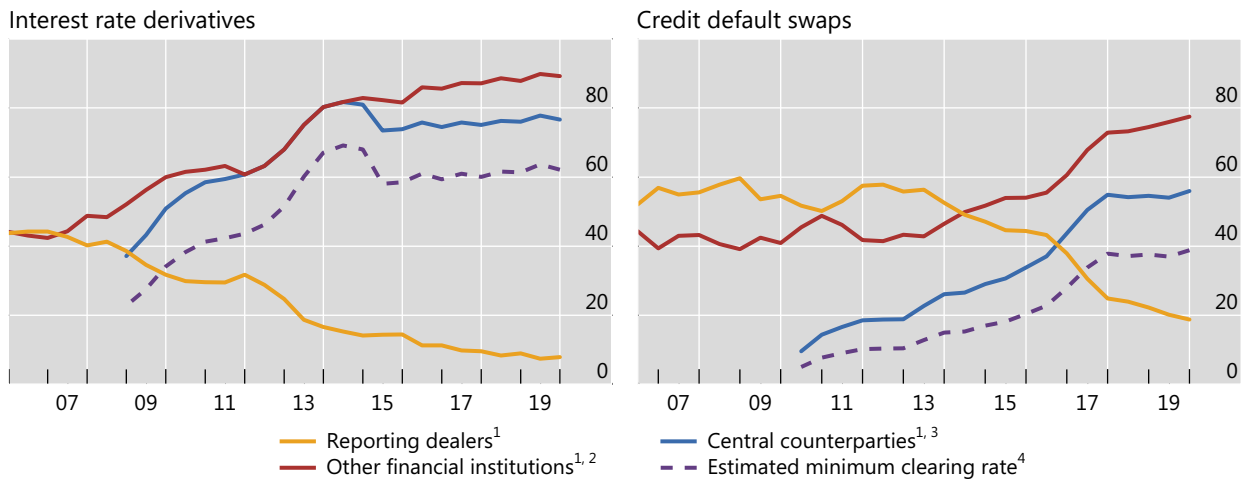
¹ The index ranges from 0 to 10,000, where a lower number indicates that there are many dealers with similar market shares (as measured by notional principal) and a higher number indicates that the market is dominated by a few reporting dealers. ² Foreign exchange forwards, foreign exchange swaps and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

Source: BIS derivatives statistics.

Growth of central clearing

Notional amounts outstanding by counterparty, in per cent

Graph D.9



Further information on the BIS derivatives statistics is available at www.bis.org/statistics/derstats.htm. For definitions, see the [online glossary](#).

¹ As a percentage of notional amounts outstanding against all counterparties. ² Including central counterparties but excluding reporting dealers. ³ For interest rate derivatives, data for CCPs prior to end-June 2016 are estimated by indexing the amounts reported at end-June 2016 to the growth since 2008 of notional amounts outstanding cleared through LCH's SwapClear service. ⁴ Proportion of trades that are cleared, estimated as $(CCP / 2) / (1 - (CCP / 2))$, where CCP represents the share of notional amounts outstanding that dealers report against CCPs. CCPs' share is halved to adjust for the potential double-counting of inter-dealer trades novated to CCPs.

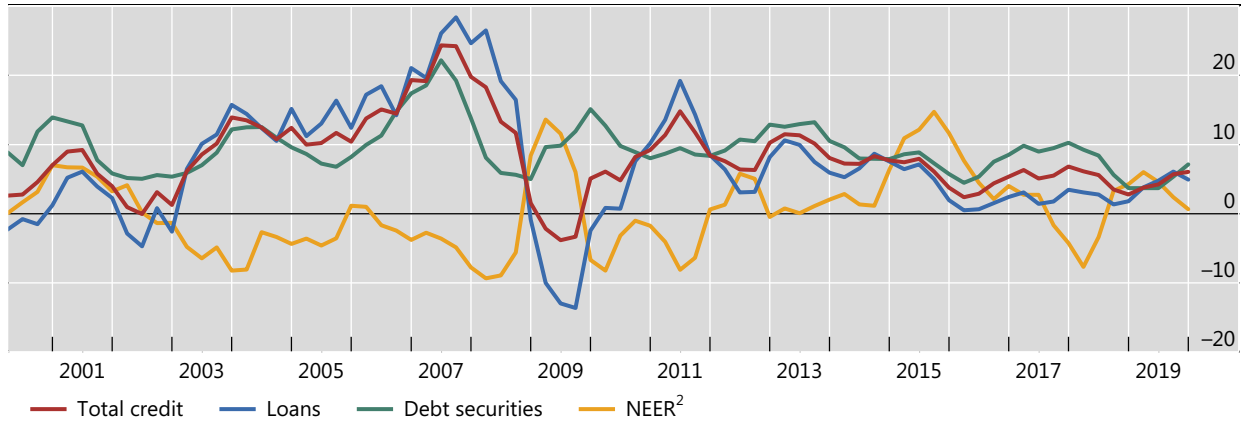
Sources: LCH.Clearnet Group Ltd; BIS OTC derivatives statistics (Table D7 and Table D10.1); BIS calculations.

E Global liquidity indicators

US dollar credit outside the United States¹

Annual change, in per cent

Graph E.1



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

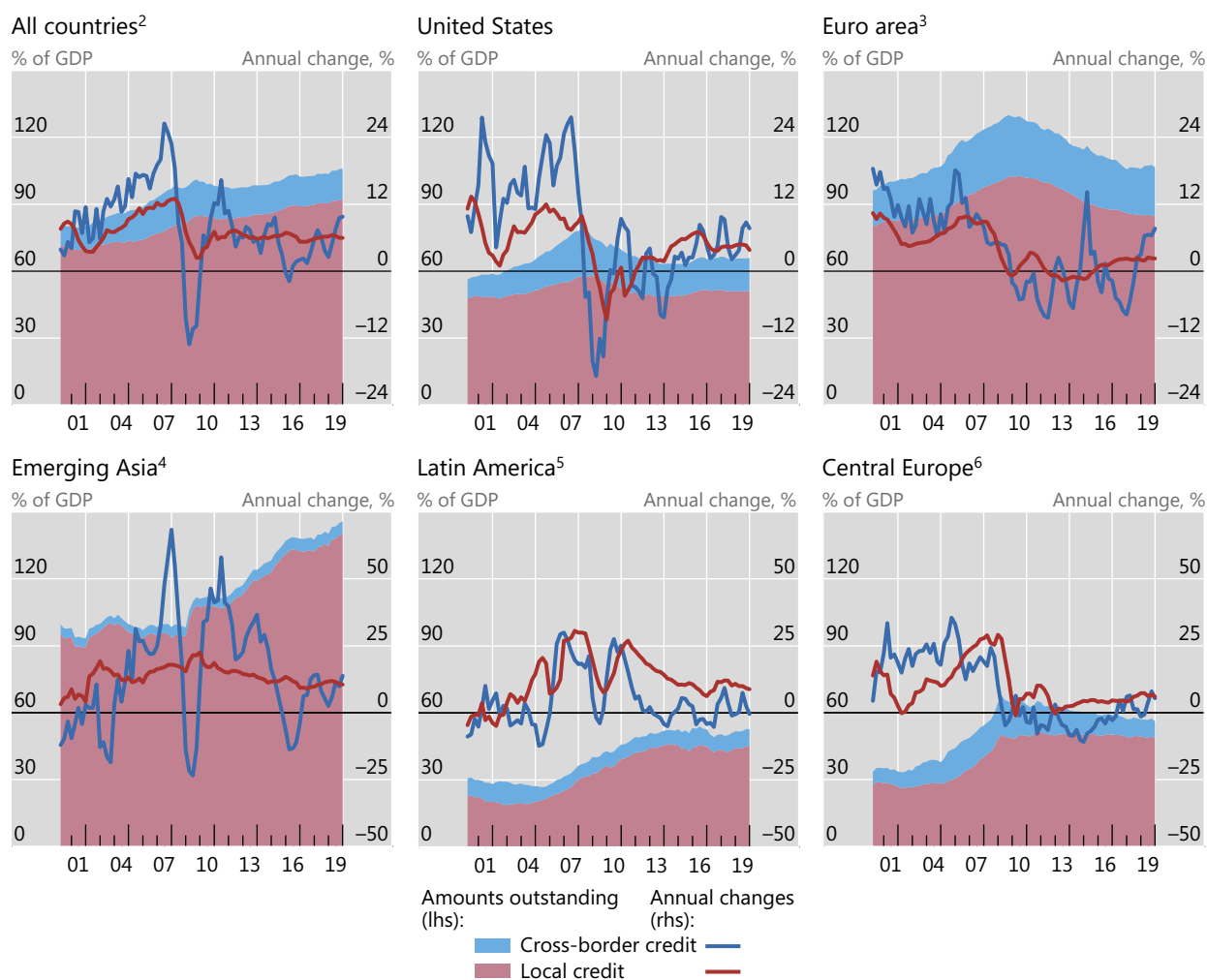
¹ Annual growth of US dollar-denominated credit to non-banks outside the United States. ² Annual growth of the US dollar nominal effective exchange rate.

Sources: Datastream; Dealogic; Euroclear; Refinitiv; Xtrakter Ltd; national data; BIS locational banking statistics; BIS effective exchange rate statistics; BIS calculations.

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

Banks' cross-border credit plus local credit in all currencies¹

Graph E.2



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

¹ Cross-border claims of LBS reporting banks to the non-bank sector plus local claims of all banks to the private non-financial sector. Weighted averages of the economies listed, based on four-quarter moving sums of GDP. ² Australia, Canada, Denmark, Japan, New Zealand, Norway, Russia, Saudi Arabia, South Africa, Sweden, Switzerland, Turkey and the United Kingdom, plus the countries in the other panels. ³ Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain. ⁴ China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Singapore and Thailand. ⁵ Argentina, Brazil, Chile and Mexico. ⁶ The Czech Republic, Hungary and Poland.

Sources: BIS credit to the non-financial sector; BIS locational banking statistics; BIS calculations.

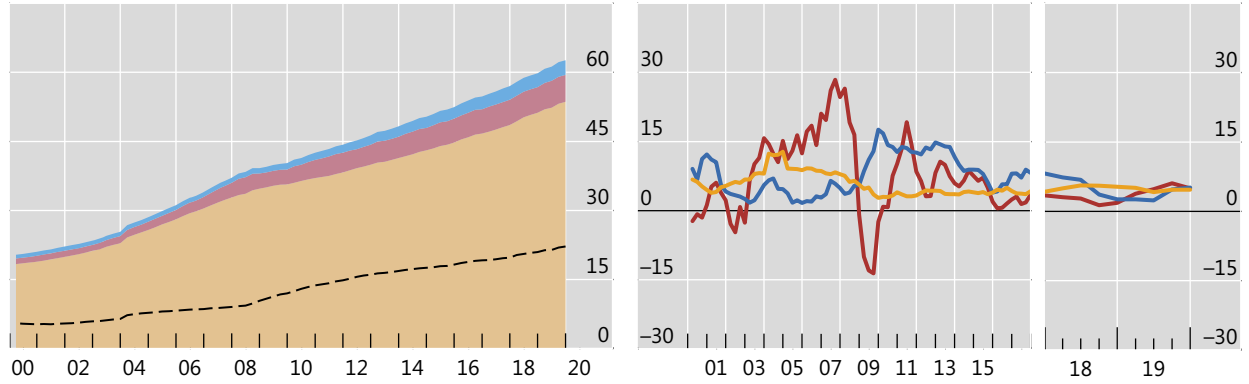
Global credit to the non-financial sector, by currency

Graph E.3

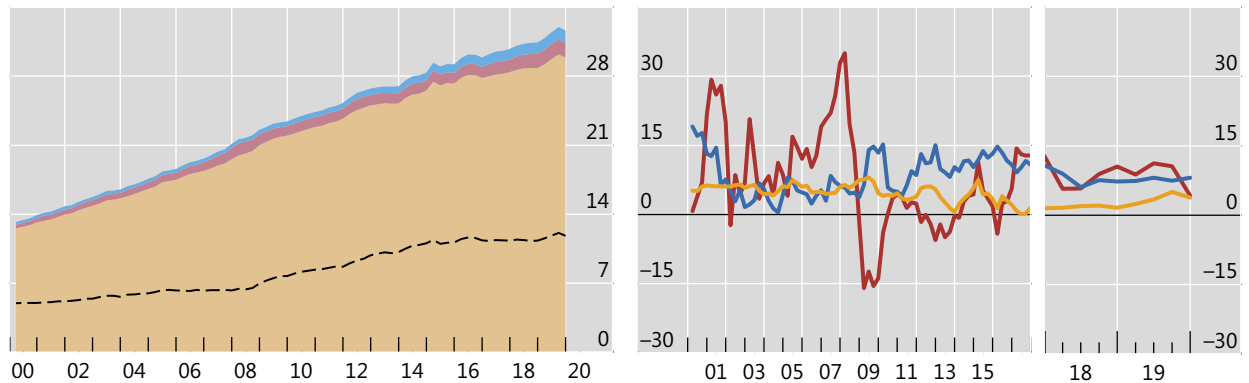
Amounts outstanding, in trillions of currency units¹

Annual change, in per cent²

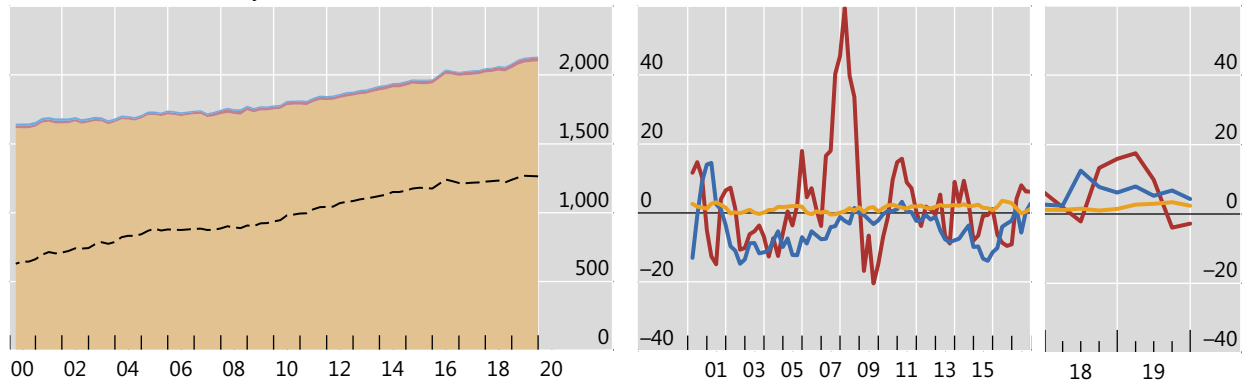
Credit denominated in US dollars (USD)



Credit denominated in euros (EUR)



Credit denominated in yen (JPY)



Credit to residents³ Credit to non-residents:
 Of which: Debt securities⁴
 Credit to government Bank loans⁵

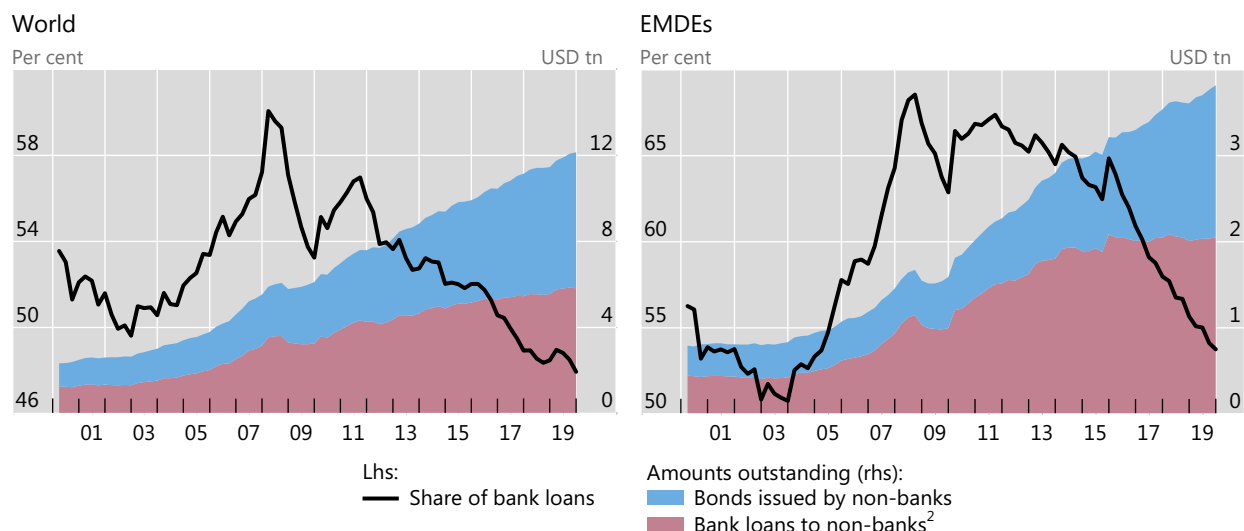
Further information on the BIS global liquidity indicators is available at www.bis.org/statistics/gli.htm.

¹ Amounts outstanding at quarter-end. ² Based on quarterly break- and exchange rate-adjusted changes. ³ 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. ⁴ 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. ⁵ Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans.

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

US dollar-denominated credit to non-banks outside the United States¹

Graph E.4



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

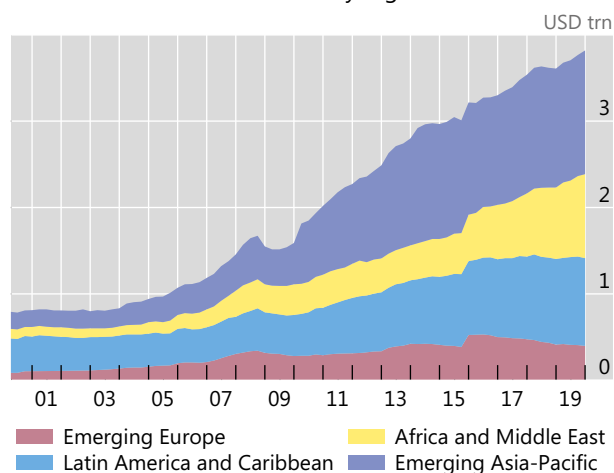
¹ Non-banks comprise non-bank financial entities, non-financial corporations, governments, households and international organisations. ² Loans by LBS-reporting banks to non-bank borrowers, including non-bank financial entities, comprise cross-border plus local loans.

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

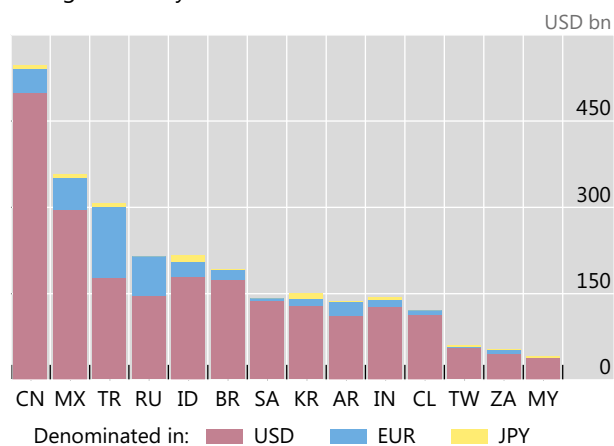
Foreign currency credit to non-banks in EMDEs

Graph E.5

US dollar-denominated credit by region



Foreign currency credit to selected EMDEs¹



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

¹ Amounts outstanding for the latest available data.

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

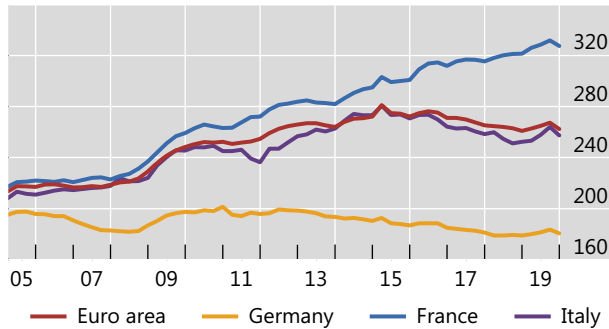
F Statistics on total credit to the non-financial sector

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

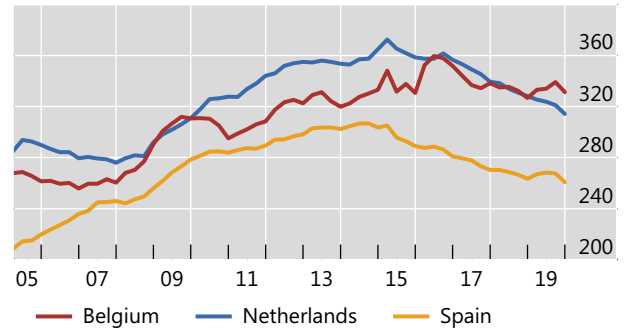
As a percentage of GDP

Graph F.1

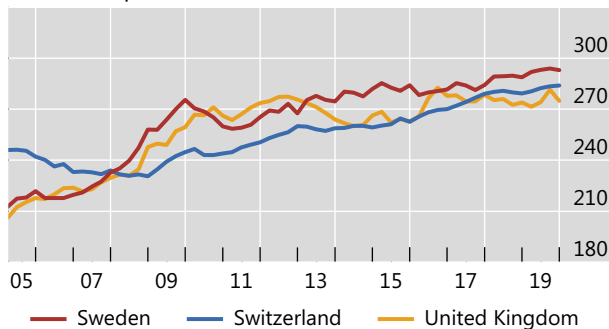
Euro area: aggregate and major countries



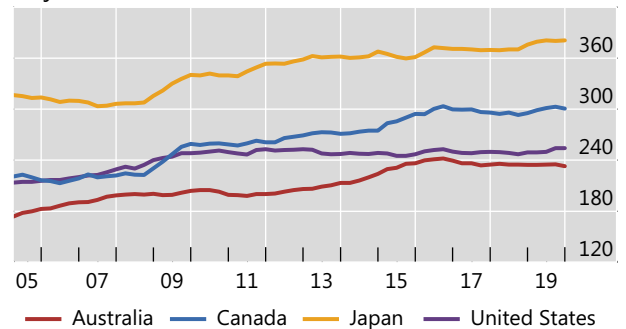
Euro area: other countries



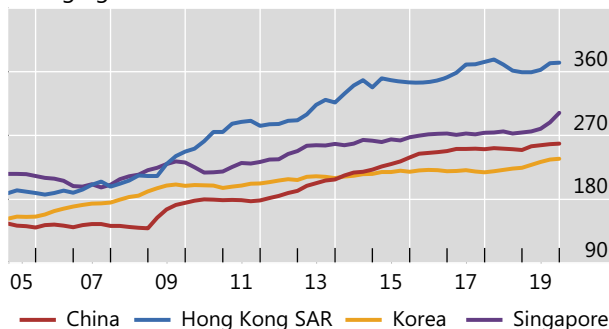
Other European countries



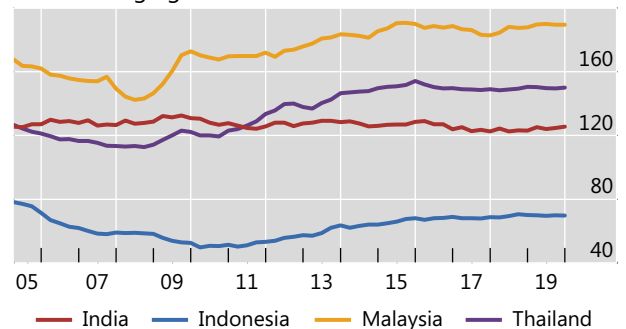
Major advanced economies



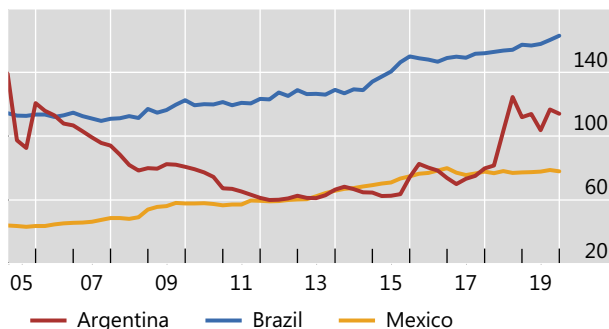
Emerging Asia



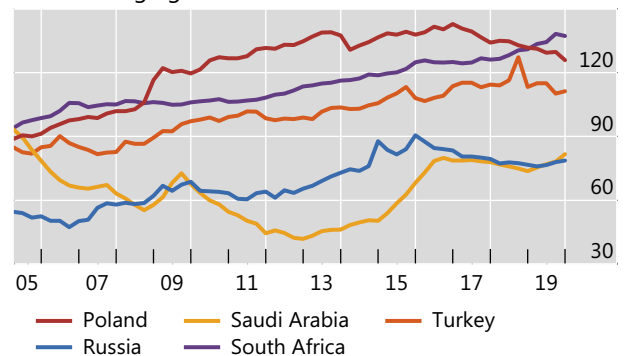
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at www.bis.org/statistics/totcredit.htm.

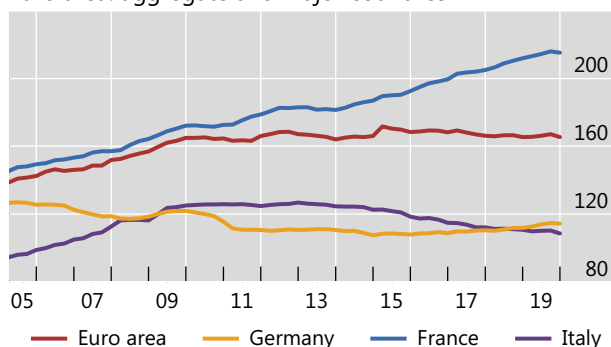
Source: BIS total credit statistics.

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

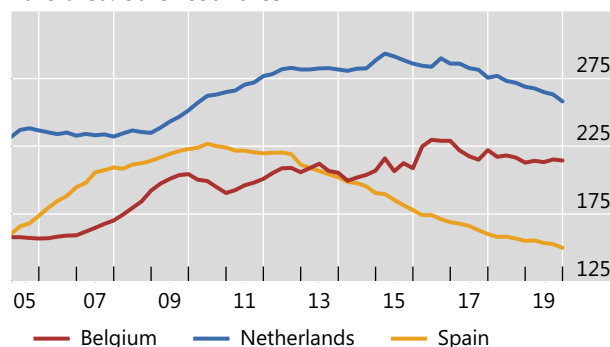
As a percentage of GDP

Graph F.2

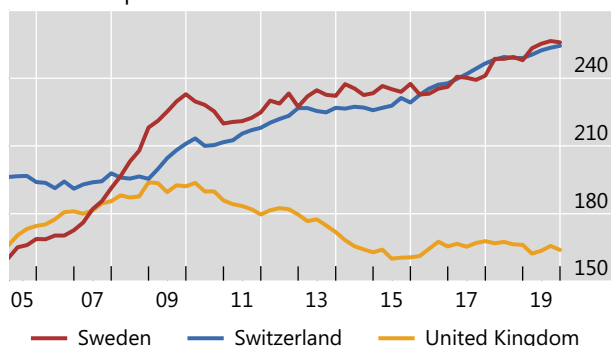
Euro area: aggregate and major countries



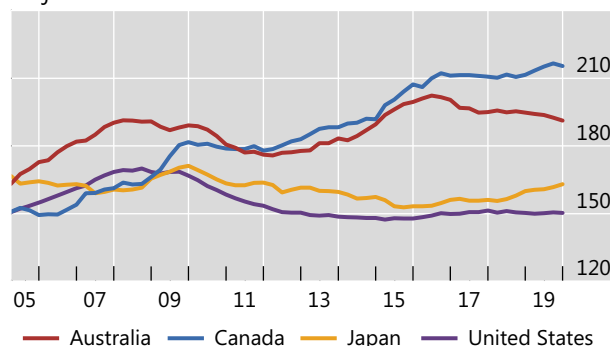
Euro area: other countries



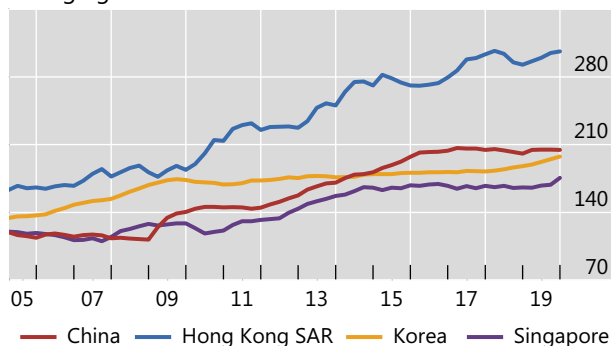
Other European countries



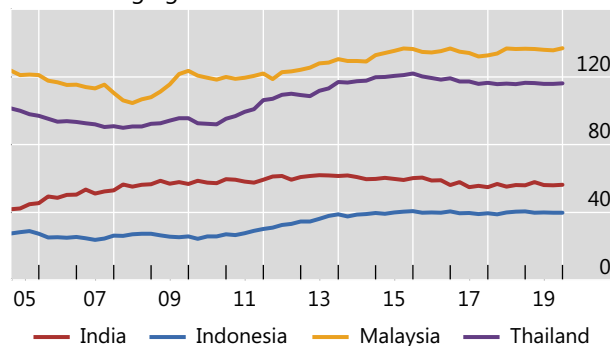
Major advanced economies



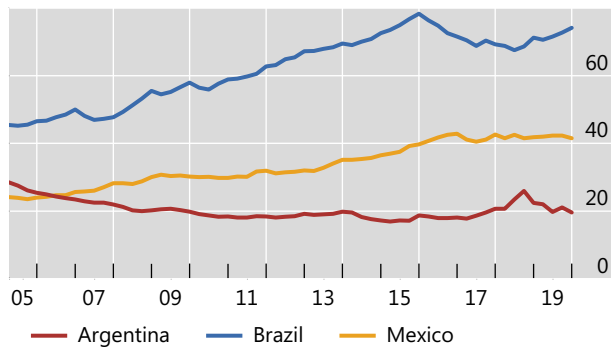
Emerging Asia



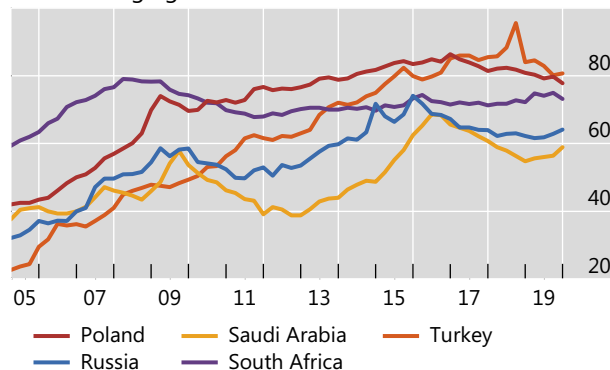
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at www.bis.org/statistics/totcredit.htm.

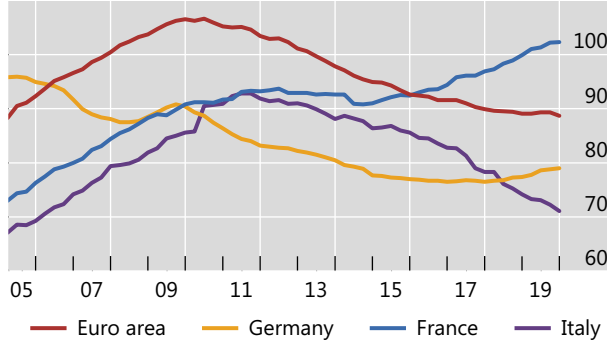
Source: BIS total credit statistics.

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

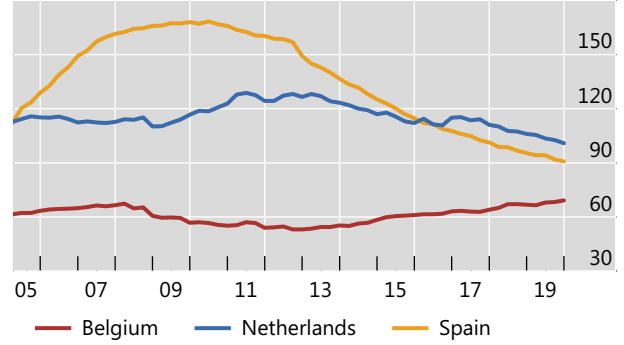
As a percentage of GDP

Graph F.3

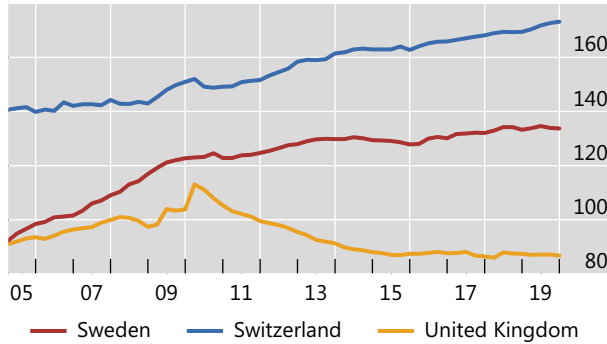
Euro area: aggregate and major countries



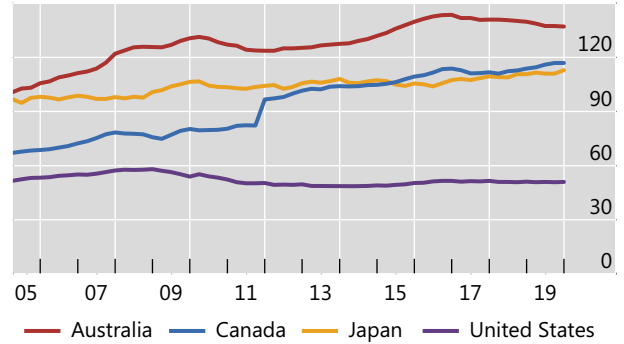
Euro area: other countries



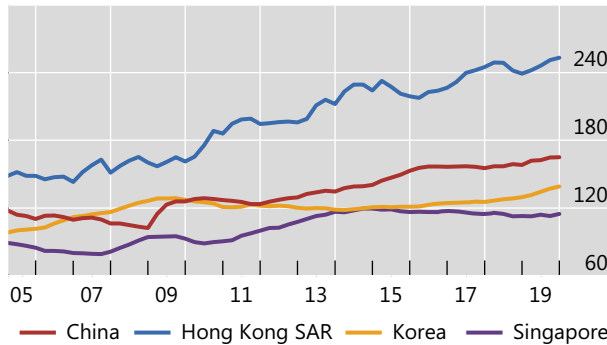
Other European countries



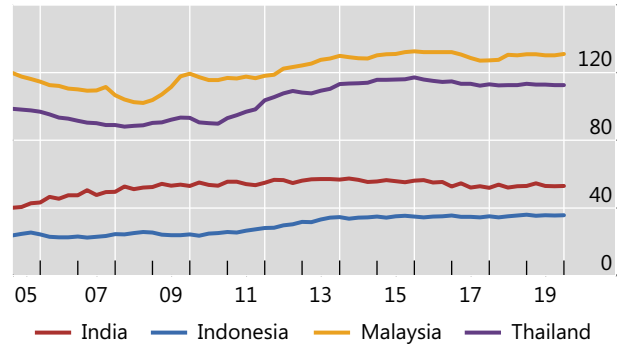
Major advanced economies



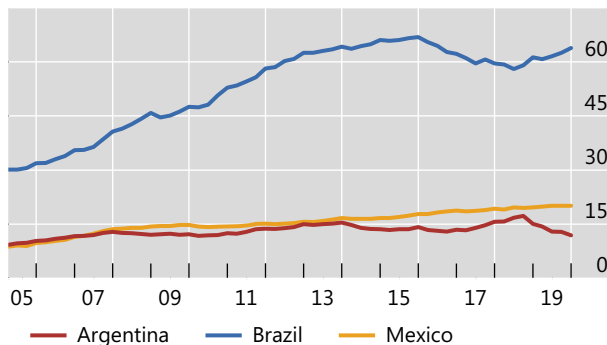
Emerging Asia



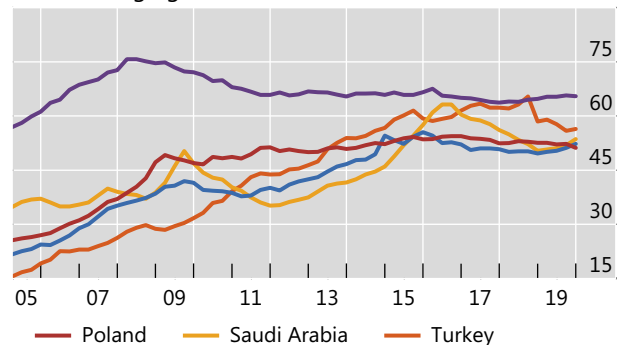
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at www.bis.org/statistics/totcredit.htm.

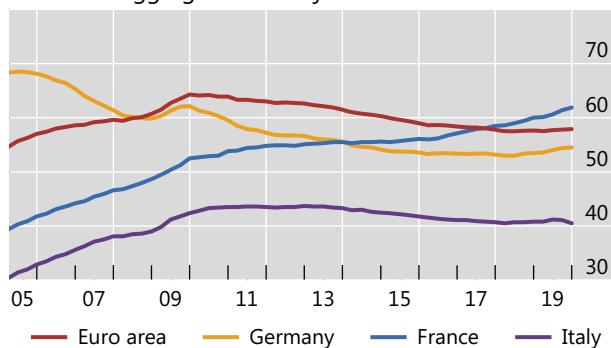
Source: BIS total credit statistics.

Total credit to households (core debt)

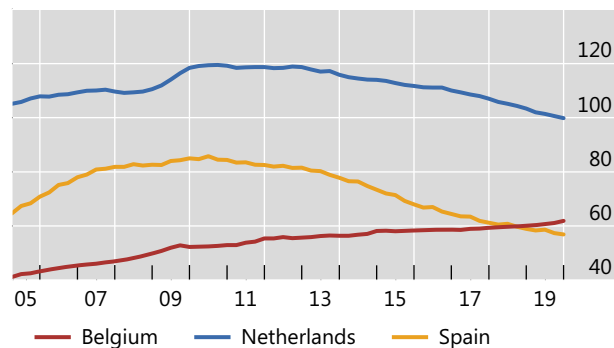
As a percentage of GDP

Graph F.4

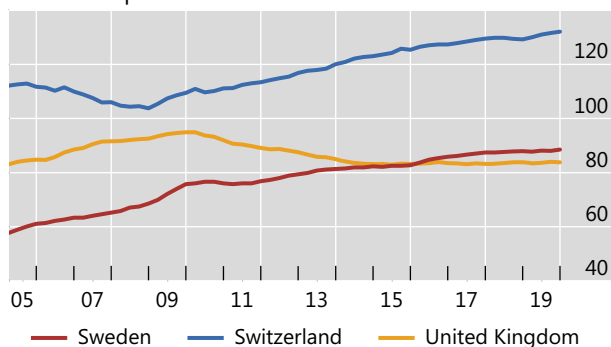
Euro area: aggregate and major countries



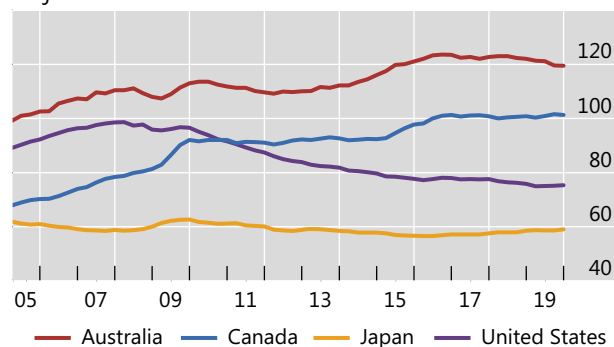
Euro area: other countries



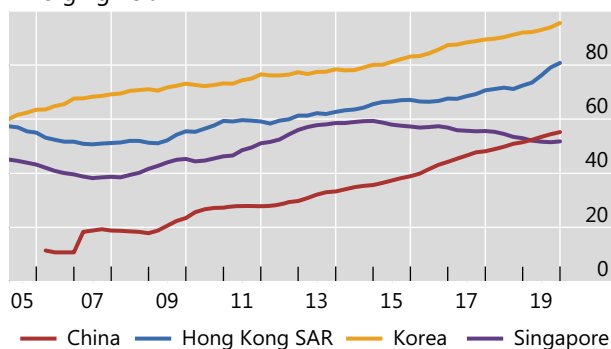
Other European countries



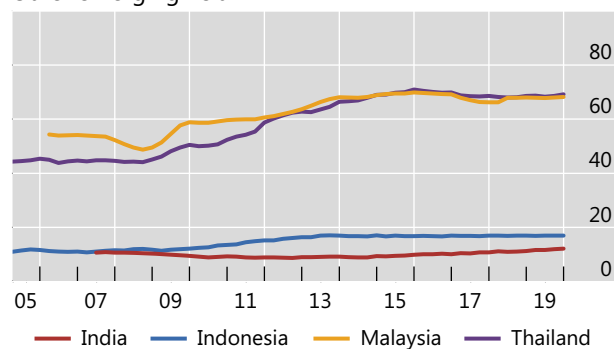
Major advanced economies



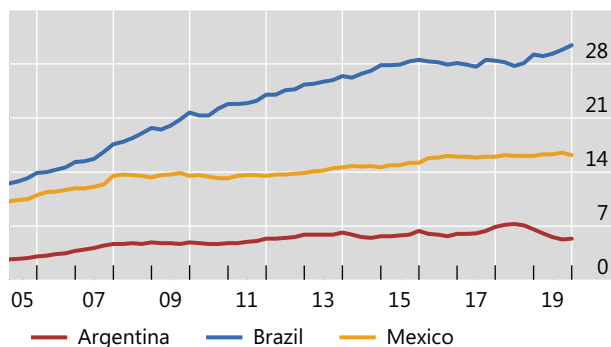
Emerging Asia



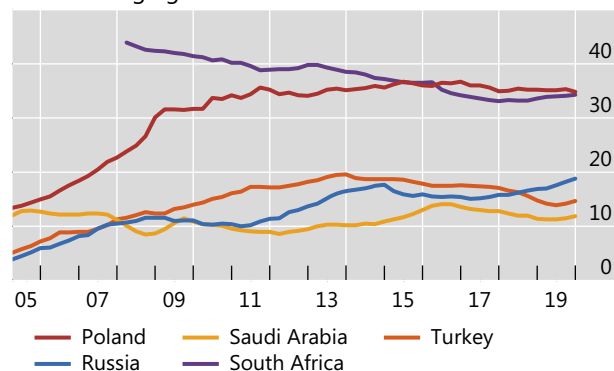
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at www.bis.org/statistics/totcredit.htm.

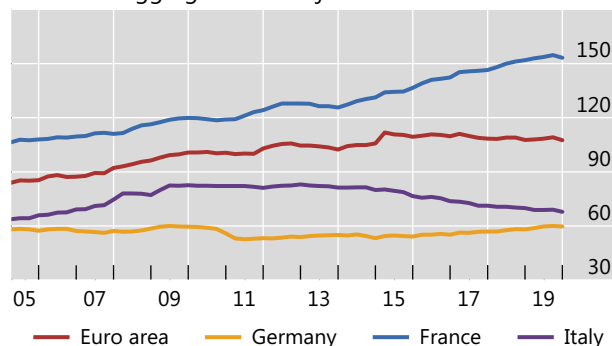
Source: BIS total credit statistics.

Total credit to non-financial corporations (core debt)

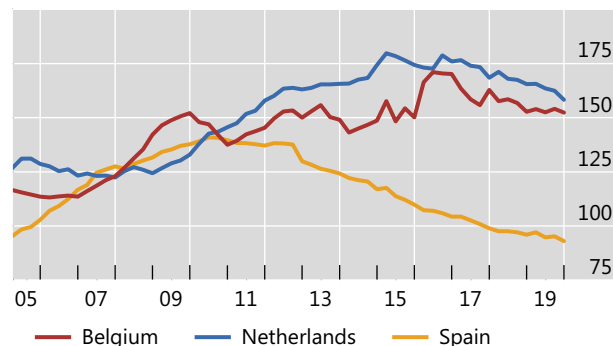
As a percentage of GDP

Graph F.5

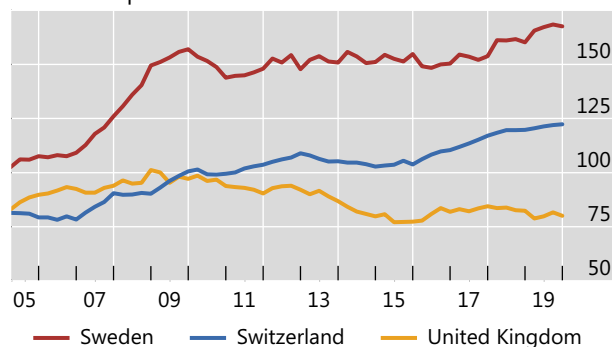
Euro area: aggregate and major countries



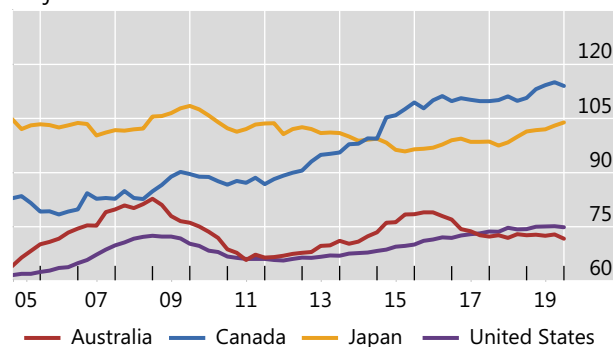
Euro area: other countries



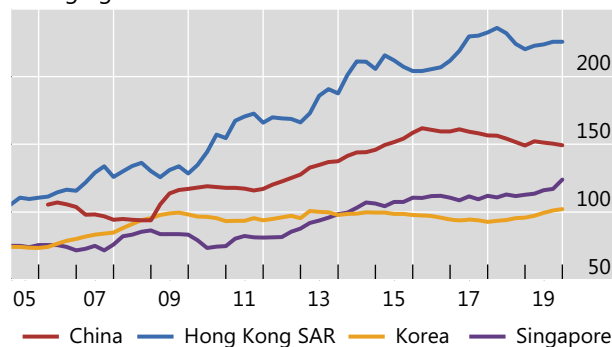
Other European countries



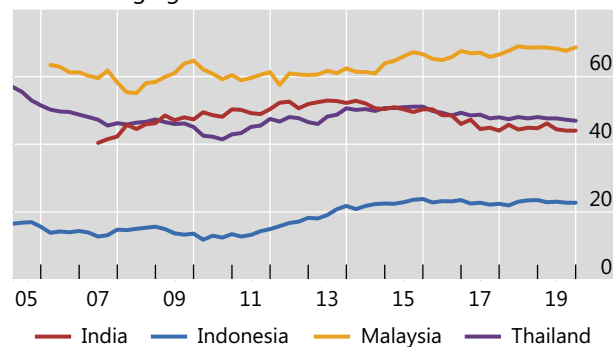
Major advanced economies



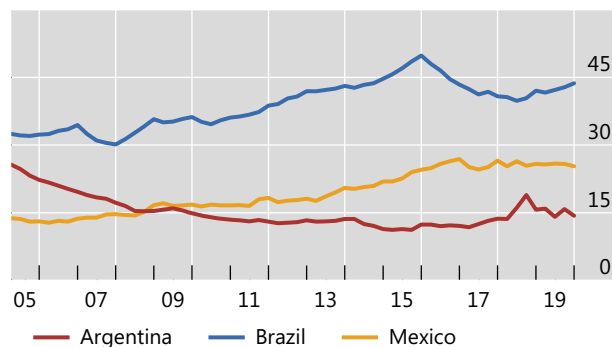
Emerging Asia



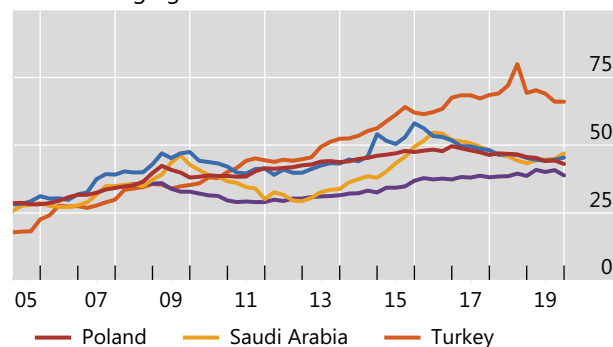
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at www.bis.org/statistics/totcredit.htm.

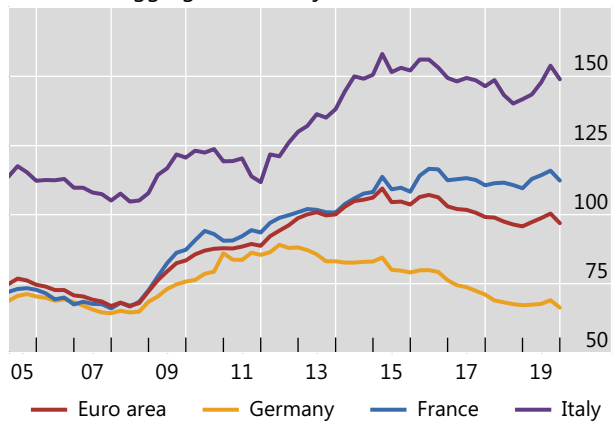
Source: BIS total credit statistics.

Total credit to the government sector at market value (core debt)¹

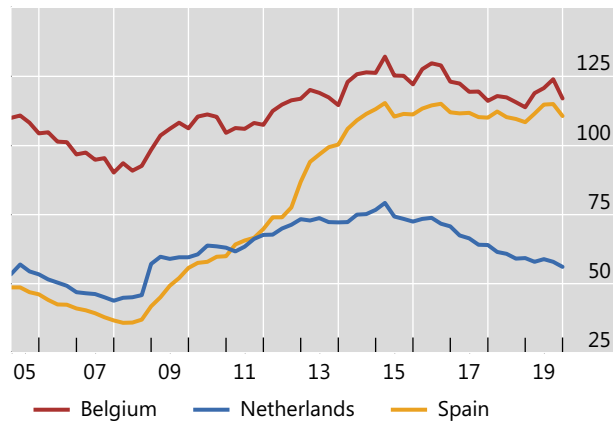
As a percentage of GDP

Graph F.6

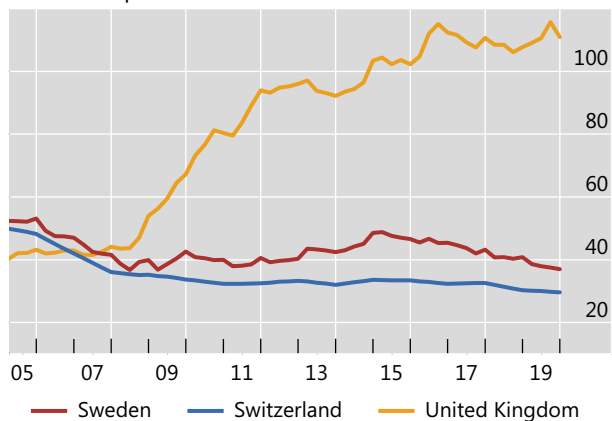
Euro area: aggregate and major countries



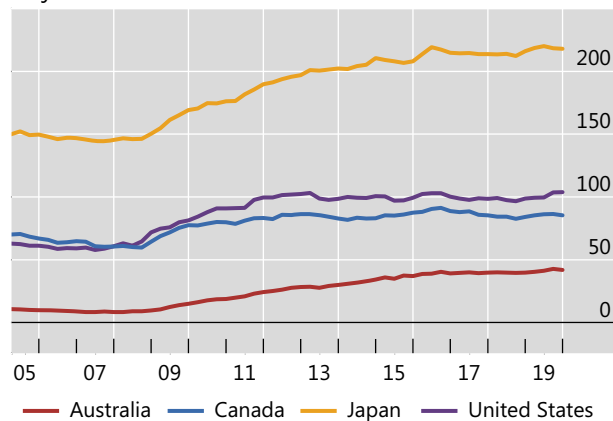
Euro area: other countries



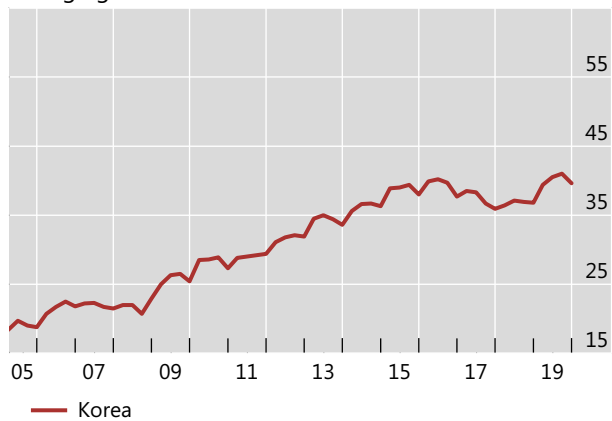
Other European countries



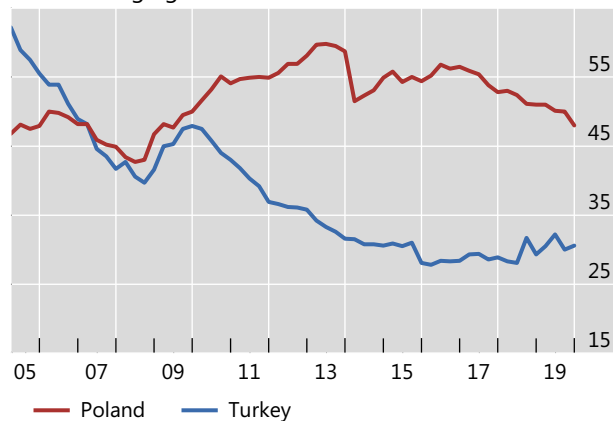
Major advanced economies



Emerging Asia



Other emerging market economies



Further information on the BIS credit statistics is available at www.bis.org/statistics/totcredit.htm.

¹ Consolidated data for the general government sector.

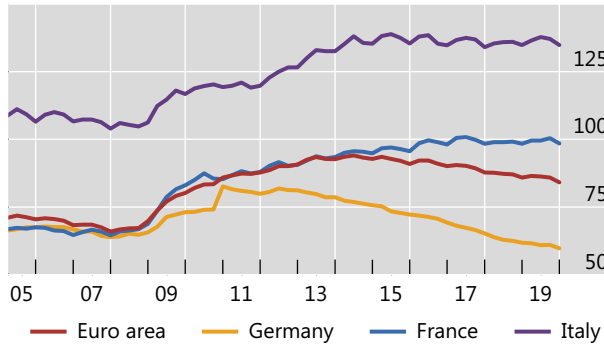
Source: BIS total credit statistics.

Total credit to the government sector at nominal value (core debt)¹

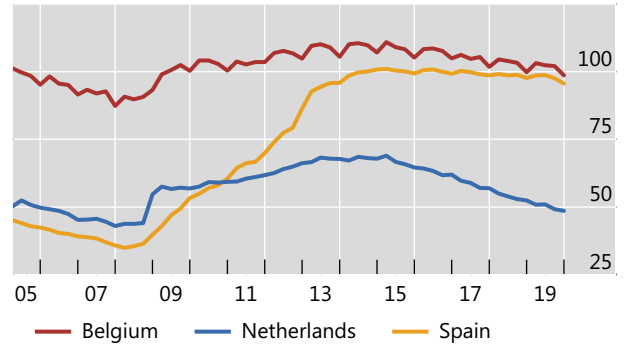
As a percentage of GDP

Graph F.7

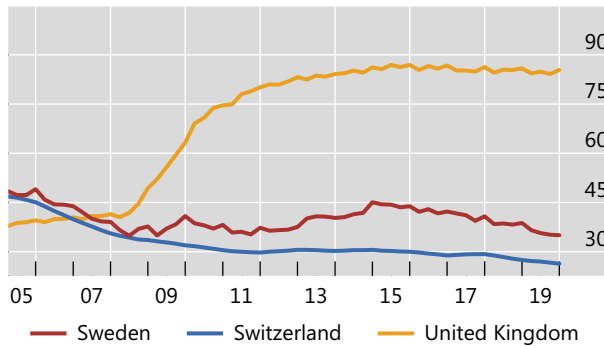
Euro area: aggregate and major countries



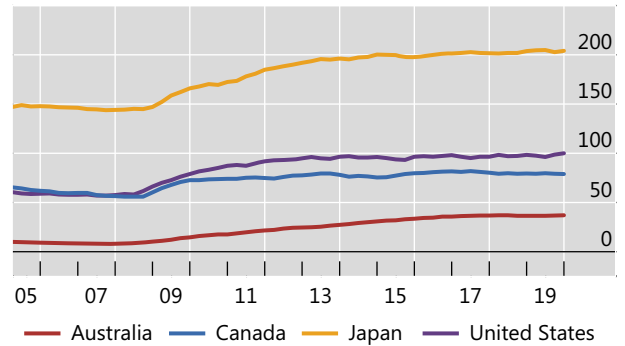
Euro area: other countries



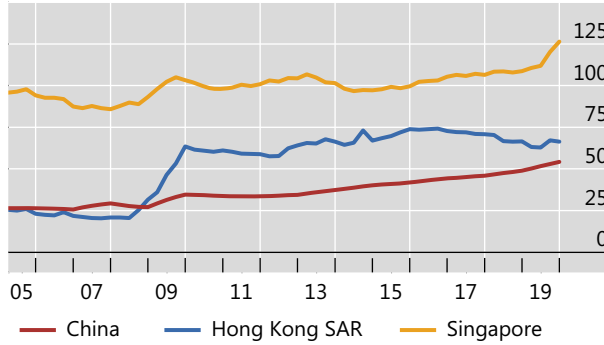
Other European countries



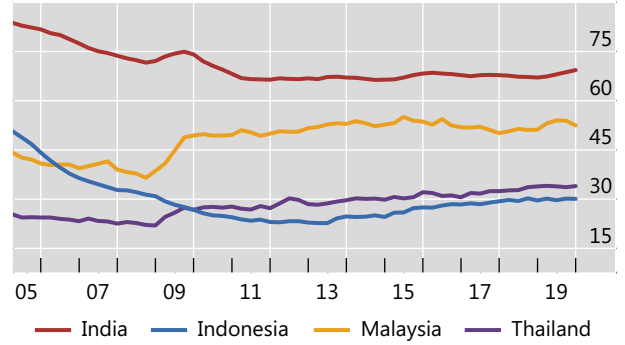
Major advanced economies



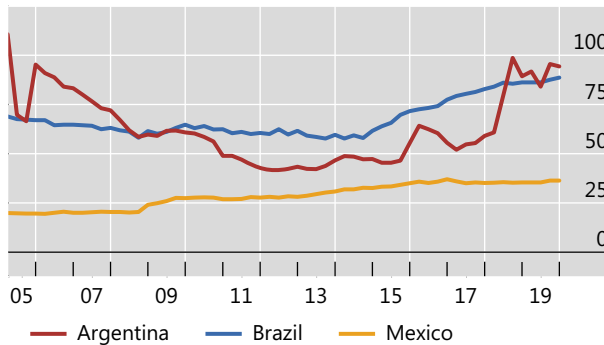
Emerging Asia



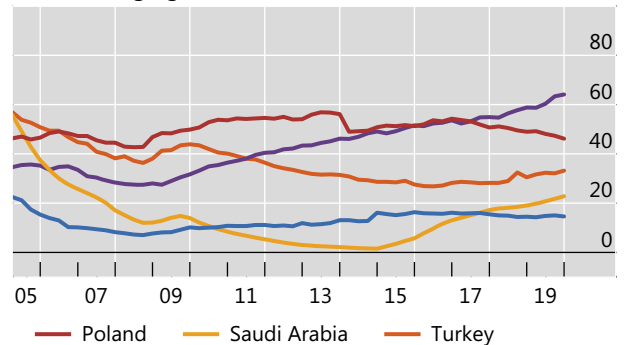
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS credit statistics is available at www.bis.org/statistics/totcredit.htm.

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

Source: BIS total credit statistics.

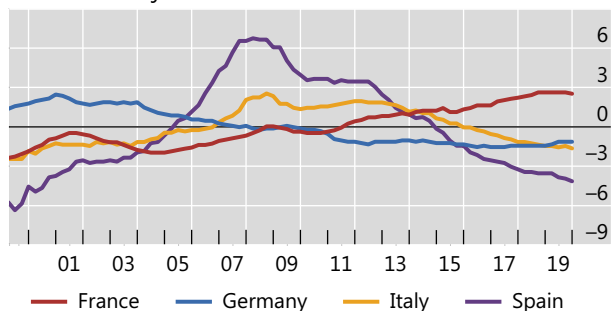
G Debt service ratios for the private non-financial sector

Debt service ratios of the private non-financial sector

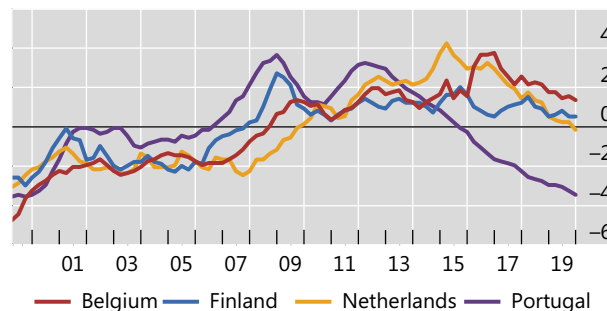
Deviation from country-specific mean, in percentage points¹

Graph G.1

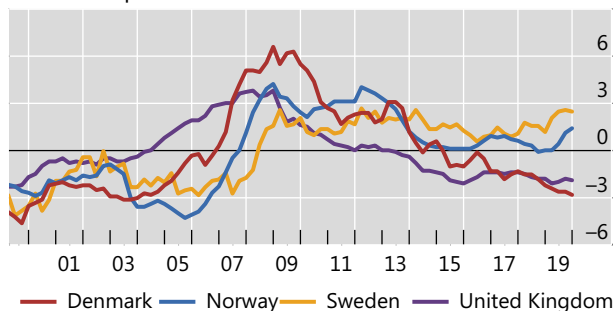
Euro area: major countries



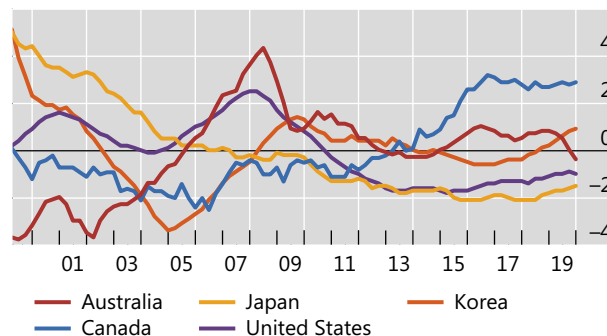
Euro area: other countries



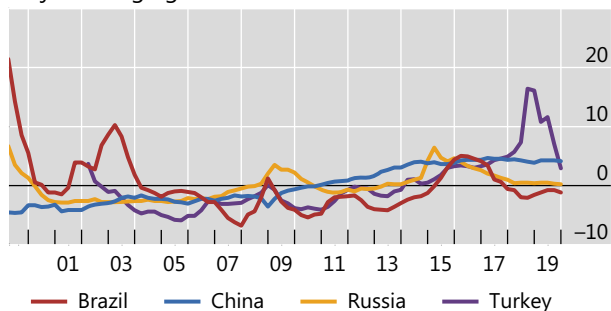
Other European countries



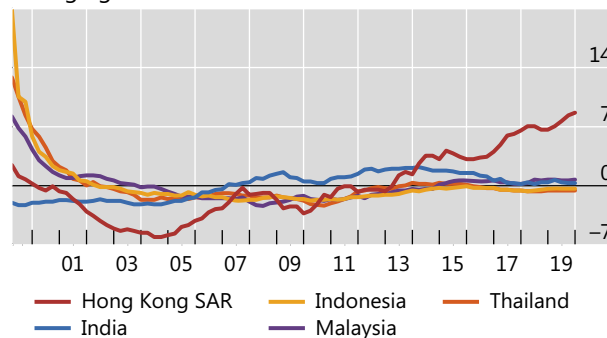
Other economies



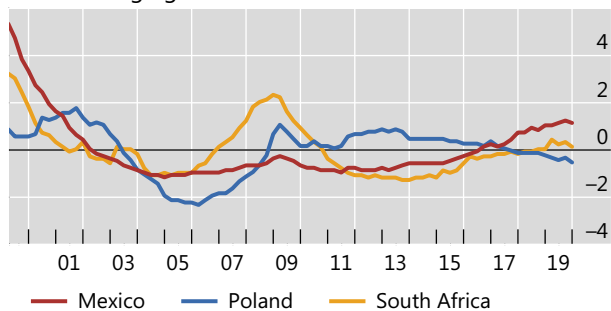
Major emerging markets²



Emerging Asia²



Other emerging markets²



Further information on the BIS debt service ratio statistics is available at www.bis.org/statistics/dsr.htm.

¹ Country-specific means are based on all available data from 1999 onwards. ² 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.

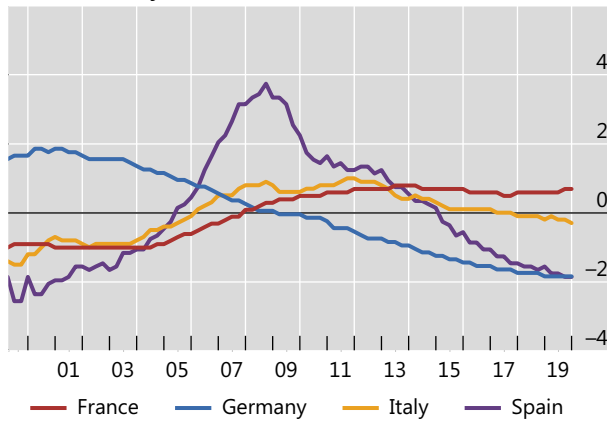
Source: BIS debt service ratios statistics.

Debt service ratios of households

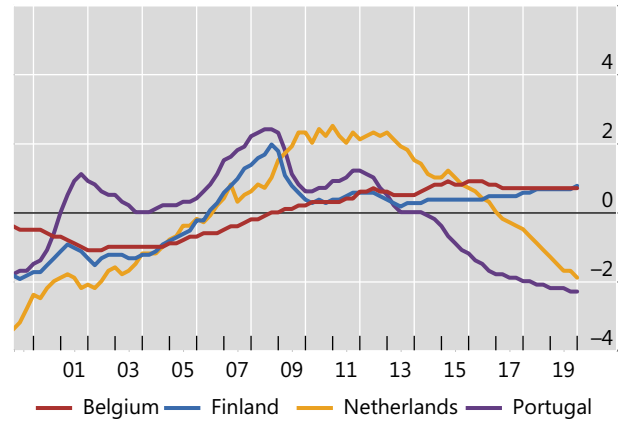
Deviation from country-specific mean, in percentage points¹

Graph G.2

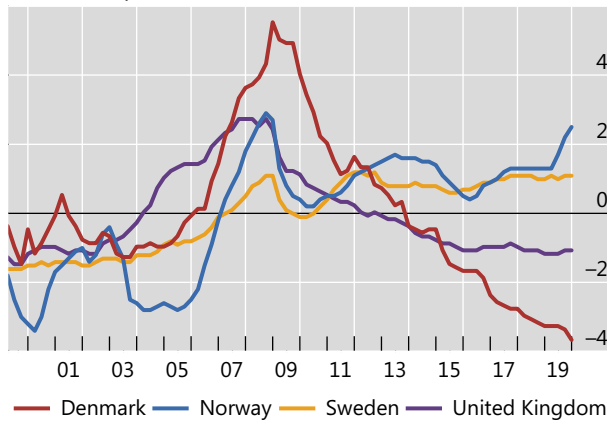
Euro area: major countries



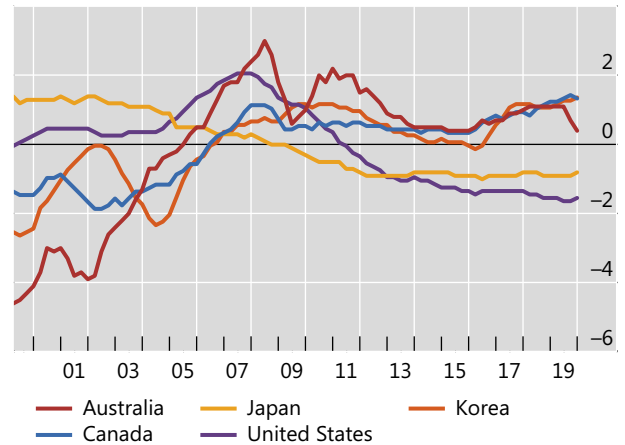
Euro area: other countries



Other European countries



Other economies



Further information on the BIS debt service ratio statistics is available at www.bis.org/statistics/dsr.htm.

¹ Country-specific means are based on all available data from 1999 onwards.

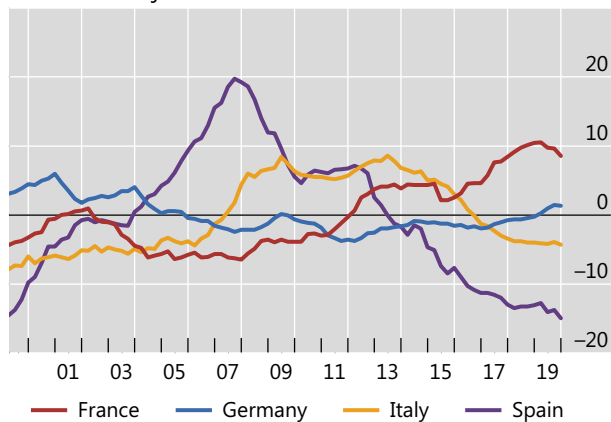
Source: BIS debt service ratios statistics.

Debt service ratios of non-financial corporations

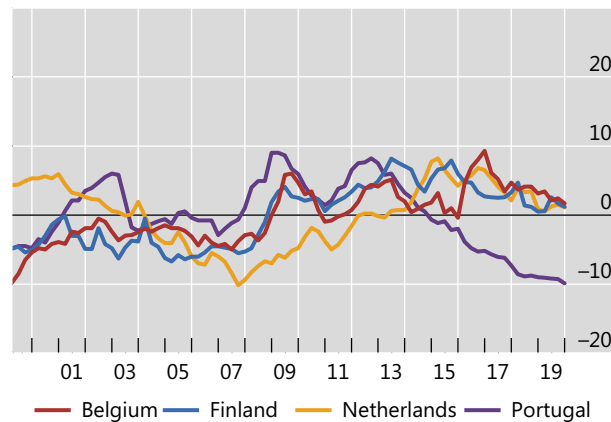
Deviation from country-specific mean, in percentage points¹

Graph G.3

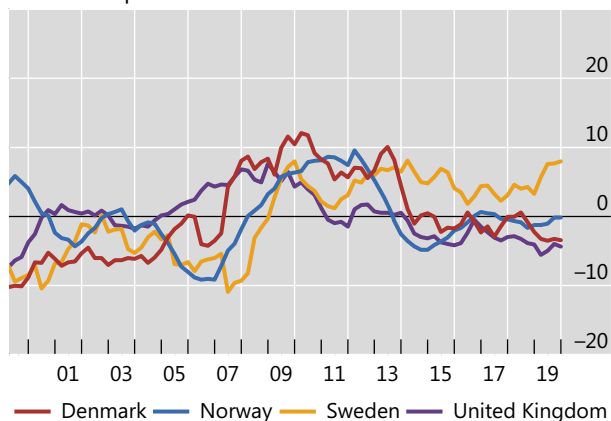
Euro area: major countries



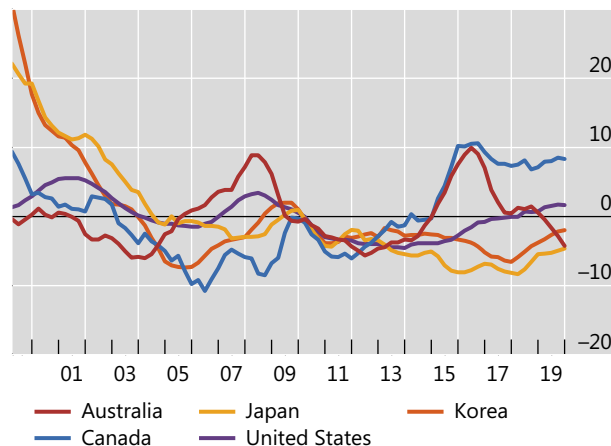
Euro area: other countries



Other European countries



Other economies



Further information on the BIS debt service ratio statistics is available at www.bis.org/statistics/dsr.htm.

¹ Country-specific means are based on all available data from 1999 onwards.

Source: BIS debt service ratios statistics.

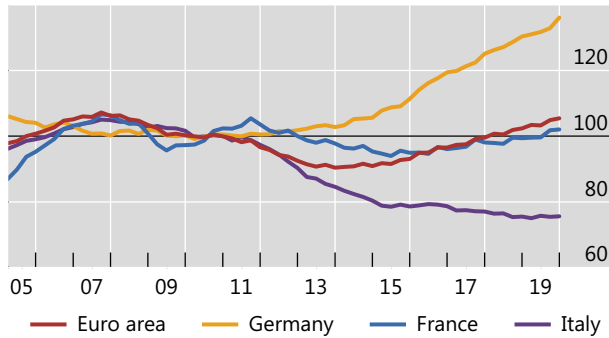
H Property price statistics

Real residential property prices

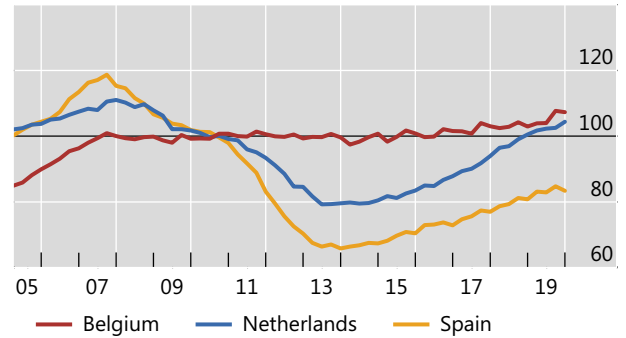
CPI-deflated, 2010 = 100

Graph H.1

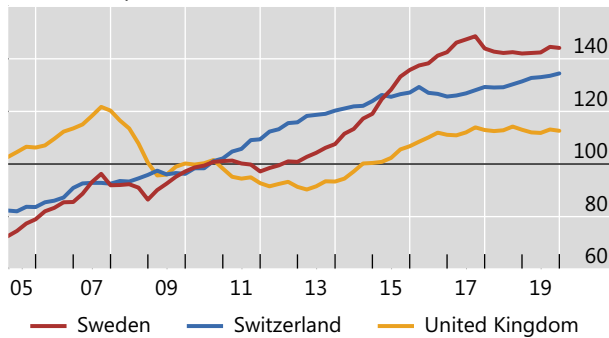
Euro area: aggregate and major countries



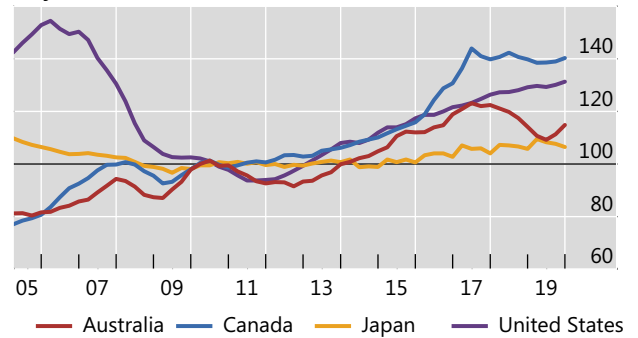
Euro area: other countries



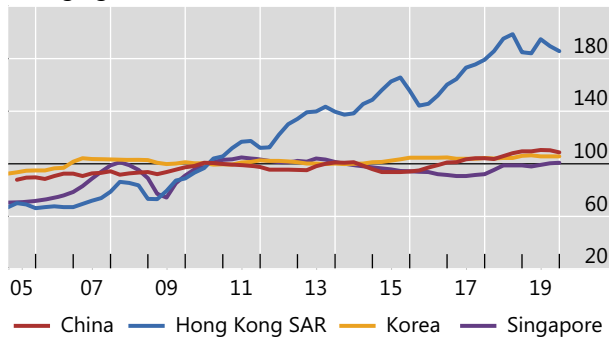
Other European countries



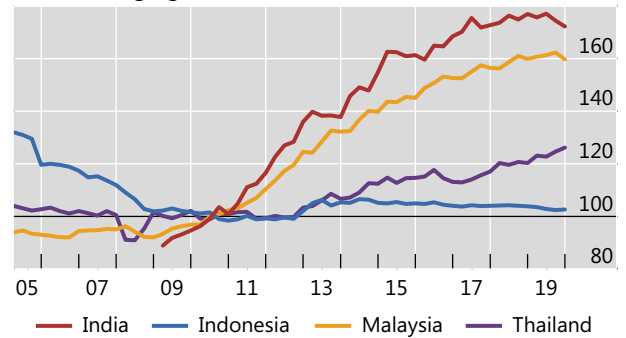
Major advanced economies



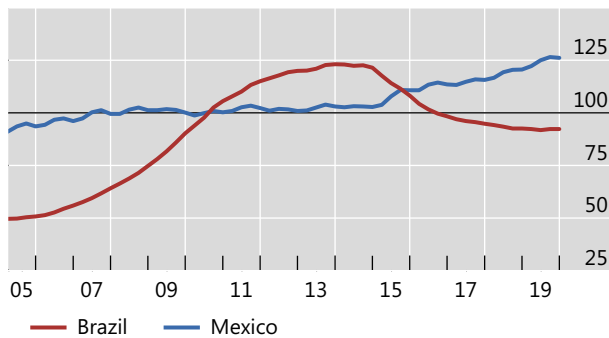
Emerging Asia



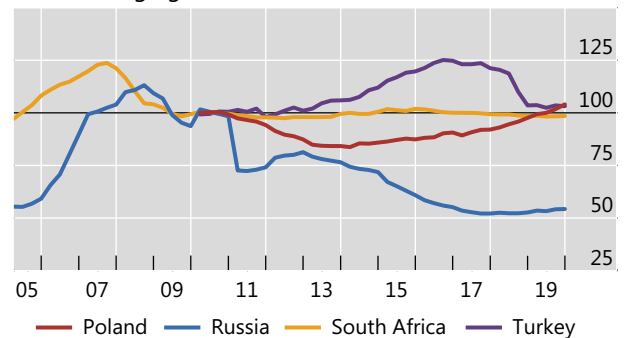
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS property price statistics is available at www.bis.org/statistics/pp.htm.

Source: BIS property prices statistics.

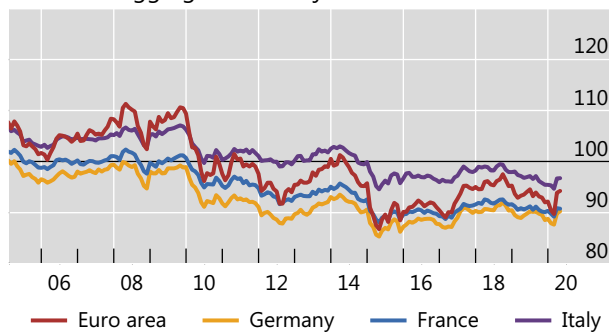
I Effective and US dollar exchange rate statistics

Real effective exchange rates

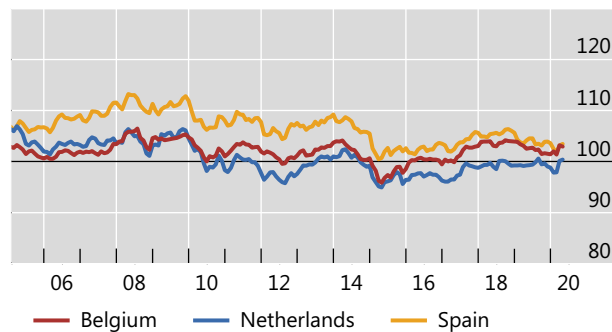
CPI-based, 1995–2005 = 100¹

Graph I.1

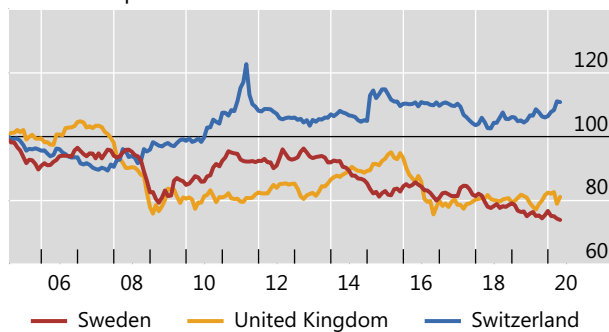
Euro area: aggregate and major countries



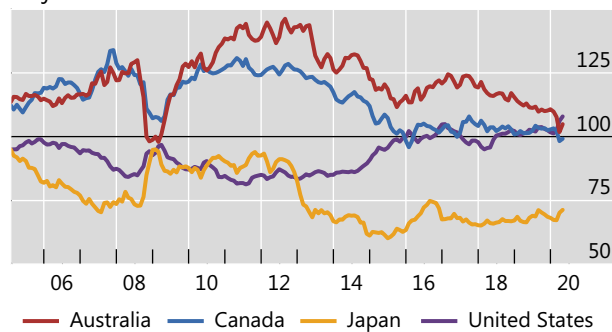
Euro area: other countries



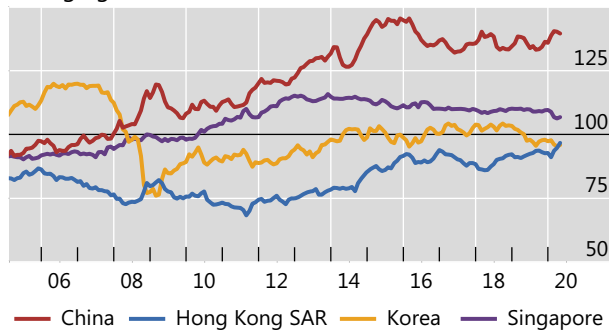
Other European countries



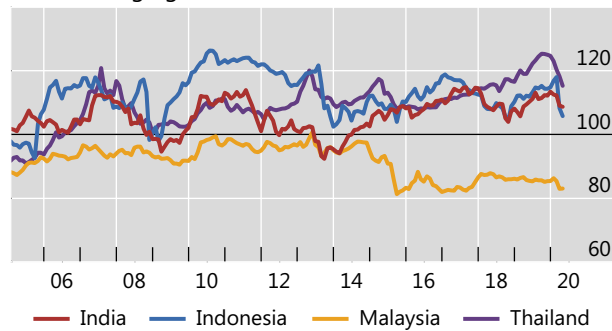
Major advanced economies



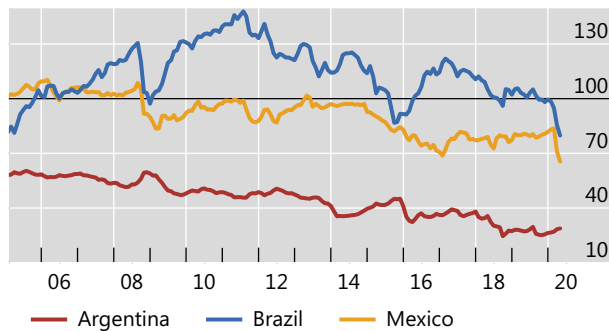
Emerging Asia



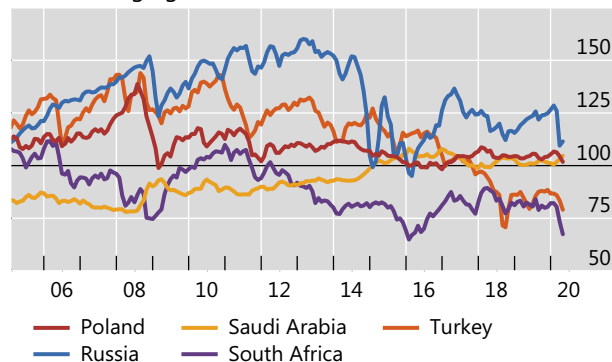
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS effective exchange rate statistics is available at www.bis.org/statistics/eer.htm.

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

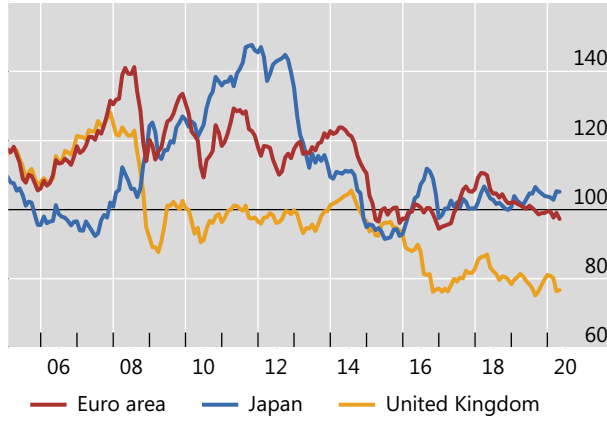
Source: BIS effective exchange rates statistics.

US dollar exchange rates

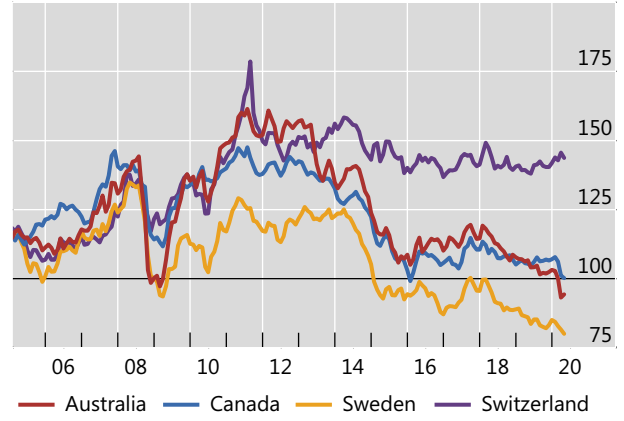
Indices, 1995–2005 = 100¹

Graph I.2

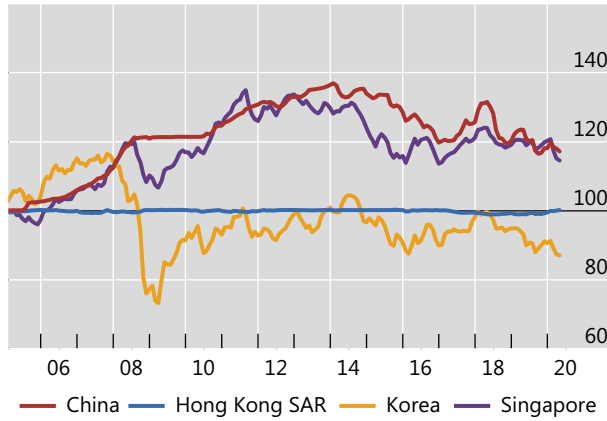
Major advanced economies



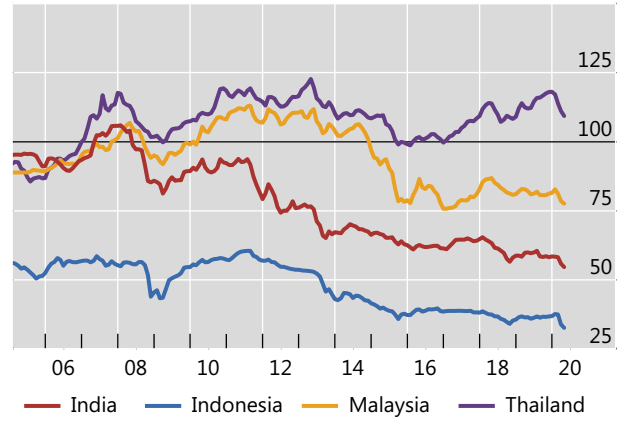
Other advanced economies



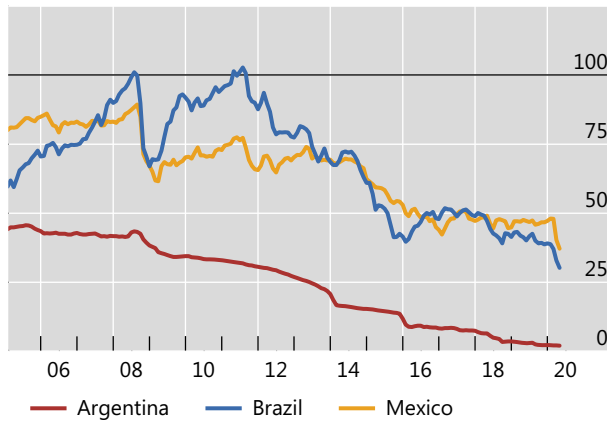
Emerging Asia



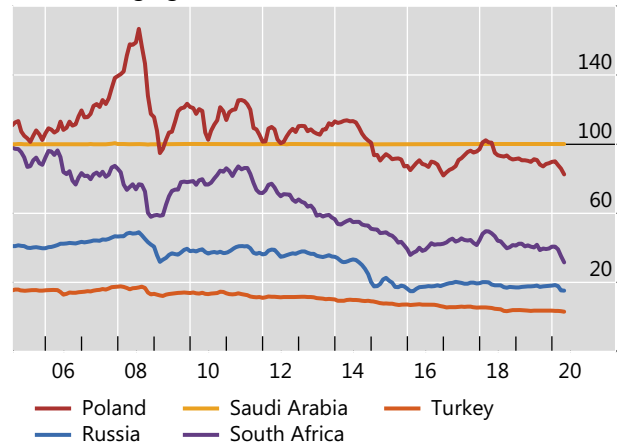
Other emerging Asia



Latin America



Other emerging market economies



Further information on the exchange rate statistics is available at www.bis.org/statistics/xrusd.htm.

¹ An increase indicates an appreciation of the local currency against the US dollar.

Source: BIS US dollar exchange rates statistics.

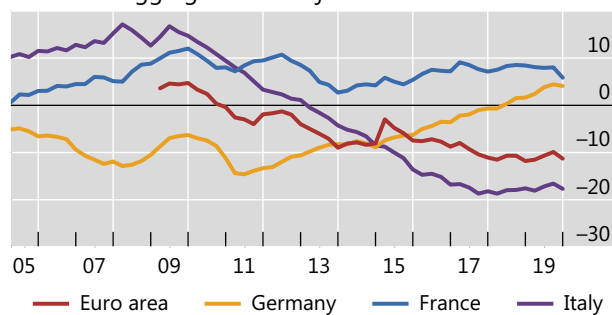
J Credit-to-GDP gaps

Credit-to-GDP gaps

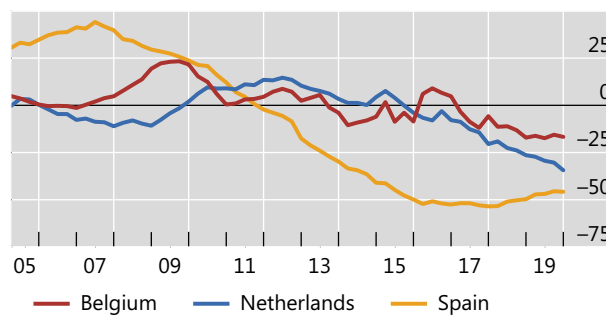
In percentage points of GDP

Graph J.1

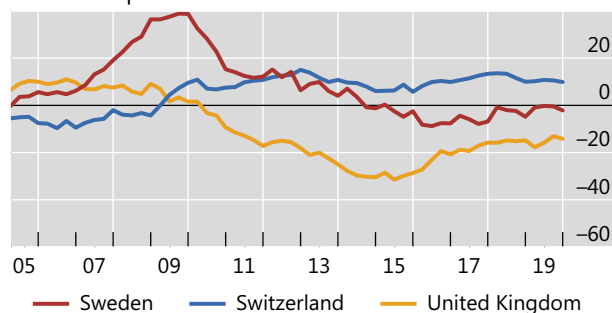
Euro area: aggregate and major countries



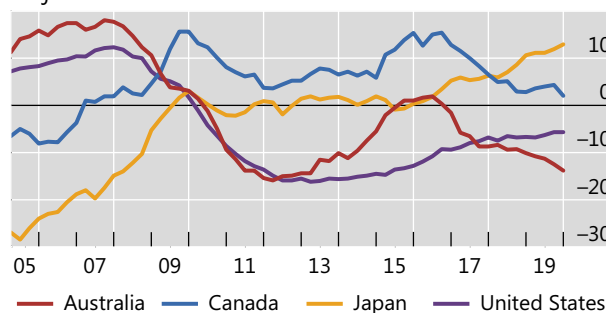
Euro area: other countries



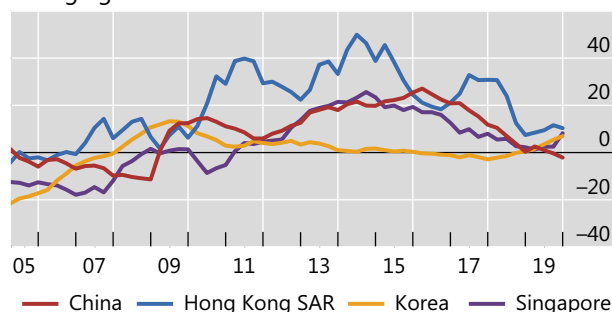
Other European countries



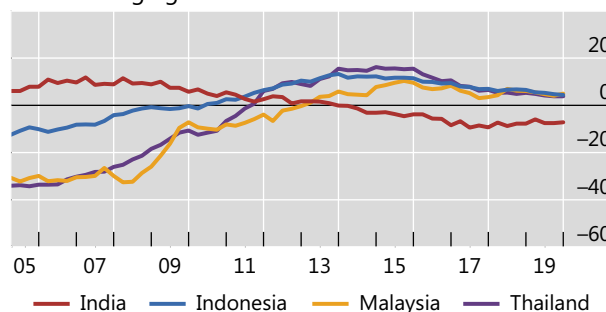
Major advanced economies



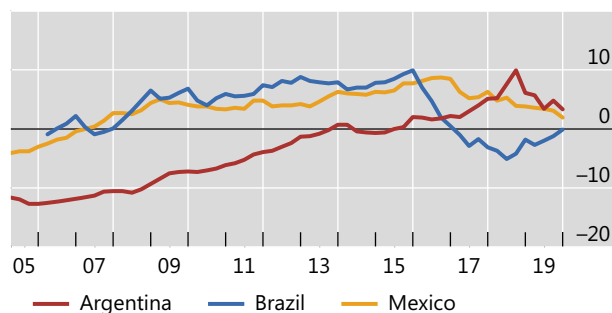
Emerging Asia



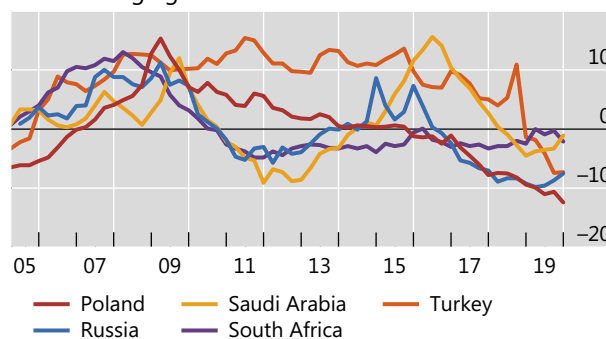
Other emerging Asia



Latin America



Other emerging market economies



¹ 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.

Source: BIS credit-to-GDP gaps statistics.

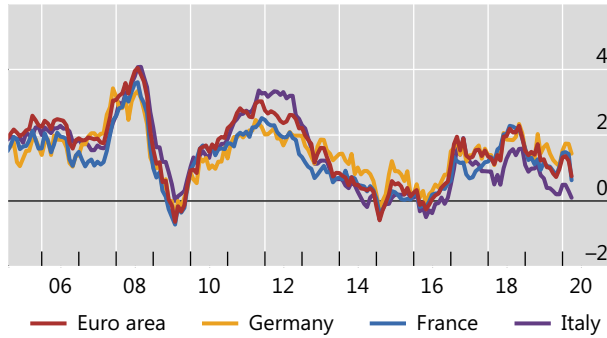
K Consumer prices

Consumer prices

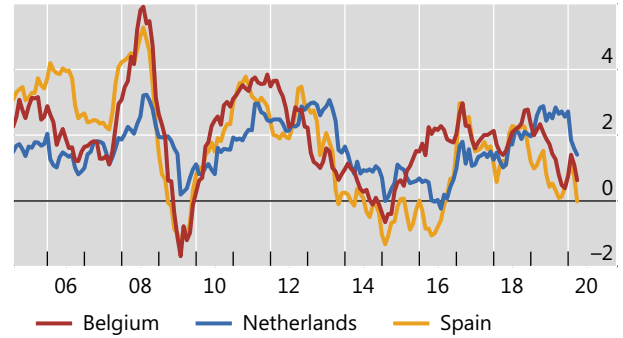
Year-on-year percentage changes

Graph K.1

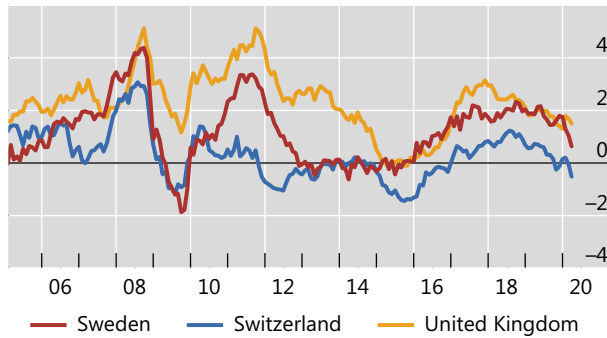
Euro area: aggregate and major countries



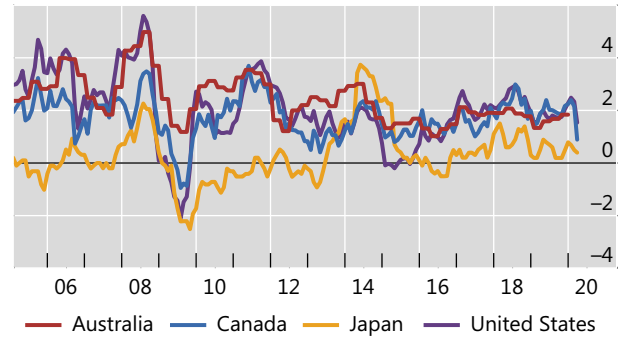
Euro area: other countries



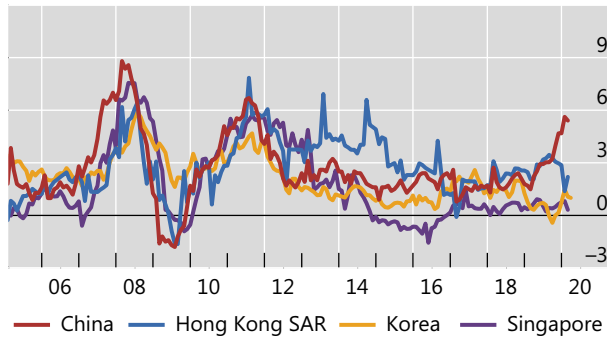
Other European countries



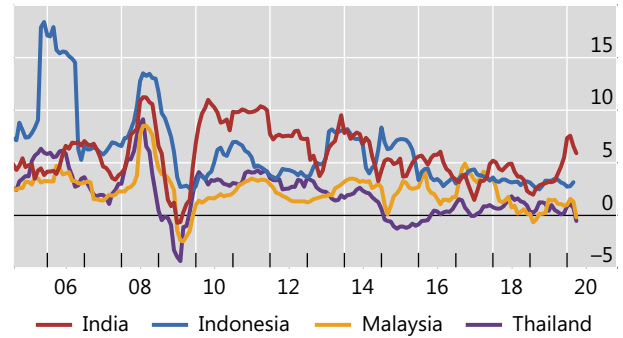
Major advanced economies



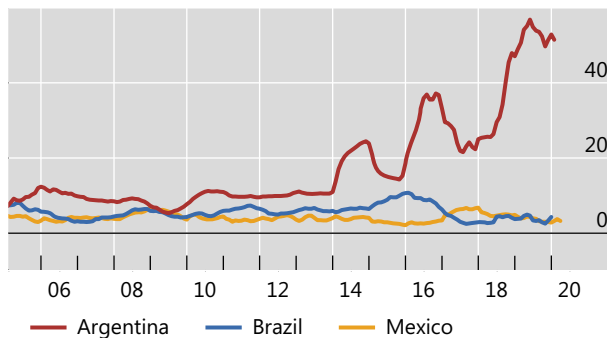
Emerging Asia



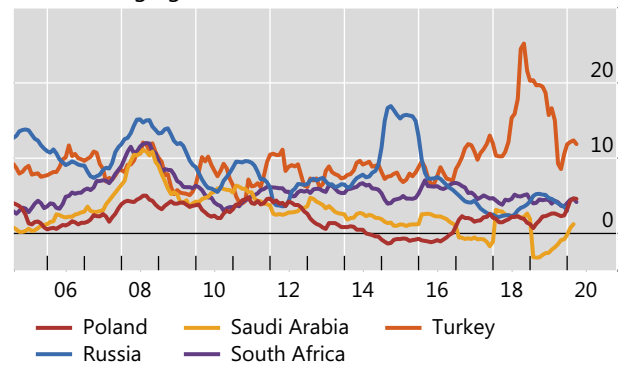
Other emerging Asia



Latin America



Other emerging market economies



Further information on the BIS consumer prices is available at www.bis.org/statistics/cp.htm.

Source: BIS consumer price statistics.

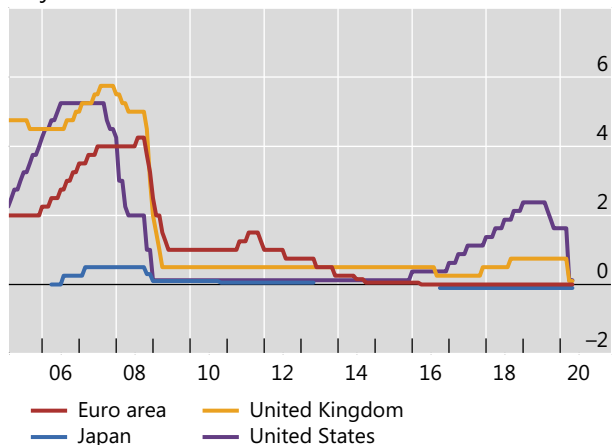
L Central bank policy rates

Central bank policy or representative rates

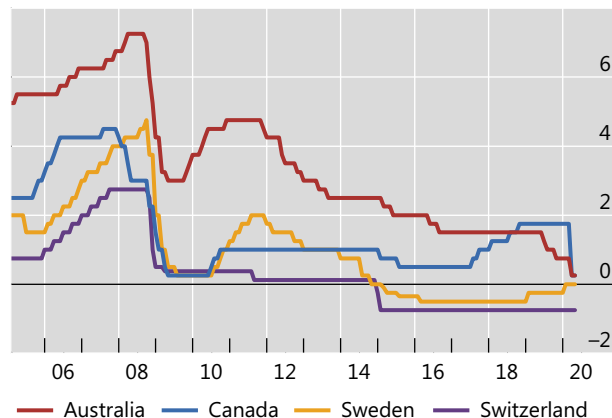
Month-end; in per cent

Graph L.1

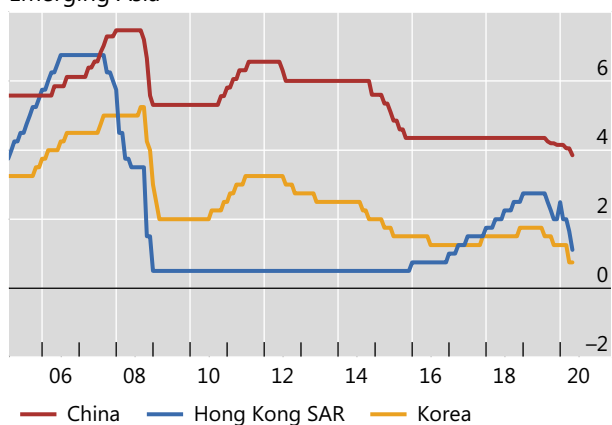
Major advanced economies



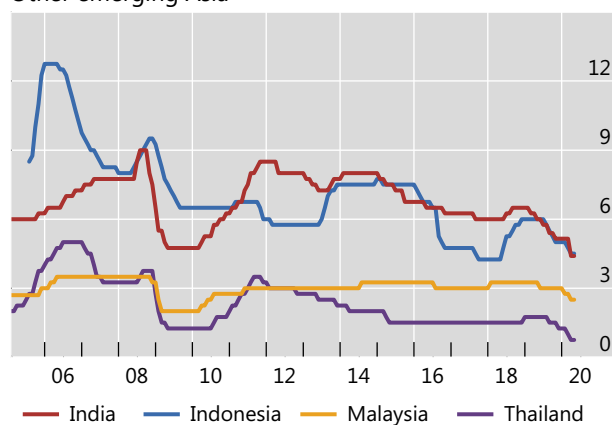
Other advanced economies



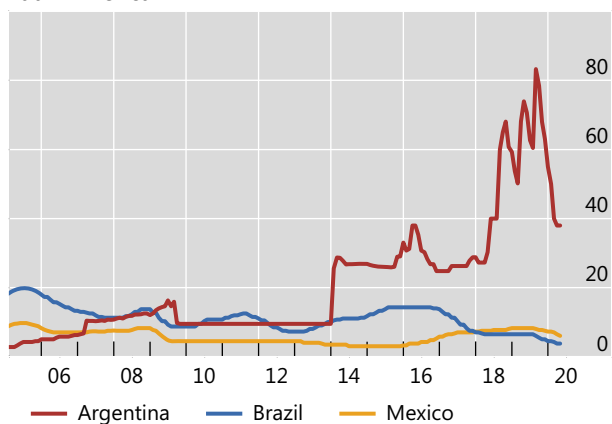
Emerging Asia



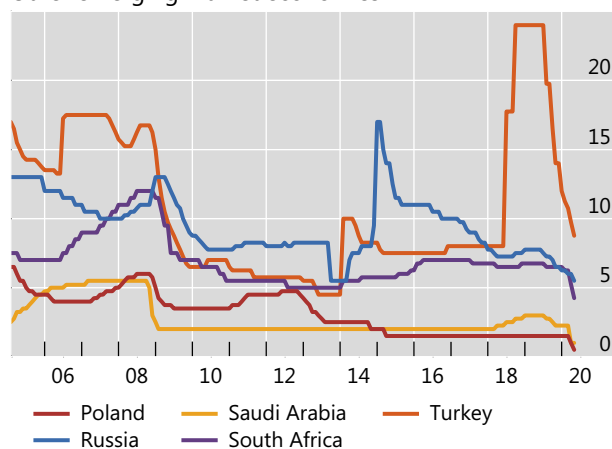
Other emerging Asia



Latin America



Other emerging market economies



Further information on the policy rates is available at www.bis.org/statistics/cbpol.htm.

Source: BIS policy rates statistics.