

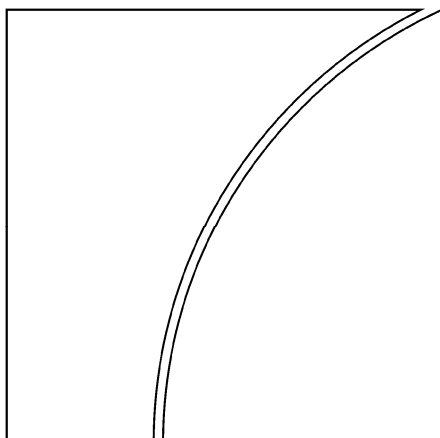


BANK FOR INTERNATIONAL SETTLEMENTS

# BIS Quarterly Review

June 2012

International banking  
and financial market  
developments



BIS Quarterly Review  
Monetary and Economic Department

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## Notations used in this Review

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

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.

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## Optimism evaporates<sup>1</sup>

Hopes for the global economic recovery and concerns about the euro area were the two main competing themes in the marketplace in the period from March to May. These two themes interacted throughout and were broadly reflected across financial markets.

Early in the period, following the ECB's longer-term refinancing operations, investor sentiment improved substantially. With bank funding strains reduced, the focus shifted to the strength of the global economy. Positive US economic news and the continued resilience of emerging market growth helped raise hopes of a steady economic recovery. The renewed optimism was particularly visible in equity and commodity markets. Fixed income markets saw a compression in credit spreads, especially for banks and selected euro area sovereigns. It also resulted in a spurt of capital inflows to emerging markets.

But by the middle of May, doubts had returned: doubts about euro area growth; doubts about the financial health of euro area sovereigns; doubts about banks; doubts about the impact of fiscal consolidation on growth; and finally, doubts about political stability inside the euro area. All of this, combined with early signs of more fragile US and Chinese growth, made investors more cautious and drove up global financial market volatility.

### Short-lived optimism about the recovery

The ECB's special longer-term refinancing operations (LTROs) successfully reduced the perceived risk of a severe banking crisis in Europe. By early March, the scale of the combined liquidity injection in the two operations had produced a noticeable impact across financial markets. Concerns about severe downside risks of market participants faded and investors' risk appetite generally picked up.

The temporary improvement in risk sentiment was also clearly reflected in the implied volatility of equity options. After having been elevated during the

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latter part of 2011, the VIX reached its lowest level since June 2007 (Graph 1, left-hand panel) on 19 March.

Funding conditions for euro area banks improved significantly as they benefited from the second instalment of the ECB's longer-term operations on 29 February. With a take-up of €530 billion for three years at the average policy rate over the duration of the loans (currently 1%), the LTRO funds helped financial institutions with funding difficulties cover maturing debt. As risk perceptions eased, European and US bank credit spreads fell, at least temporarily. The decline in spreads was most pronounced for lower-rated banks (Graph 1, centre panel). The successful easing of funding stress was highly visible in money markets, where Libor-OIS spreads tightened by around 60 basis points in the euro market and by around 20 basis points in the US dollar market (Graph 1, right-hand panel).

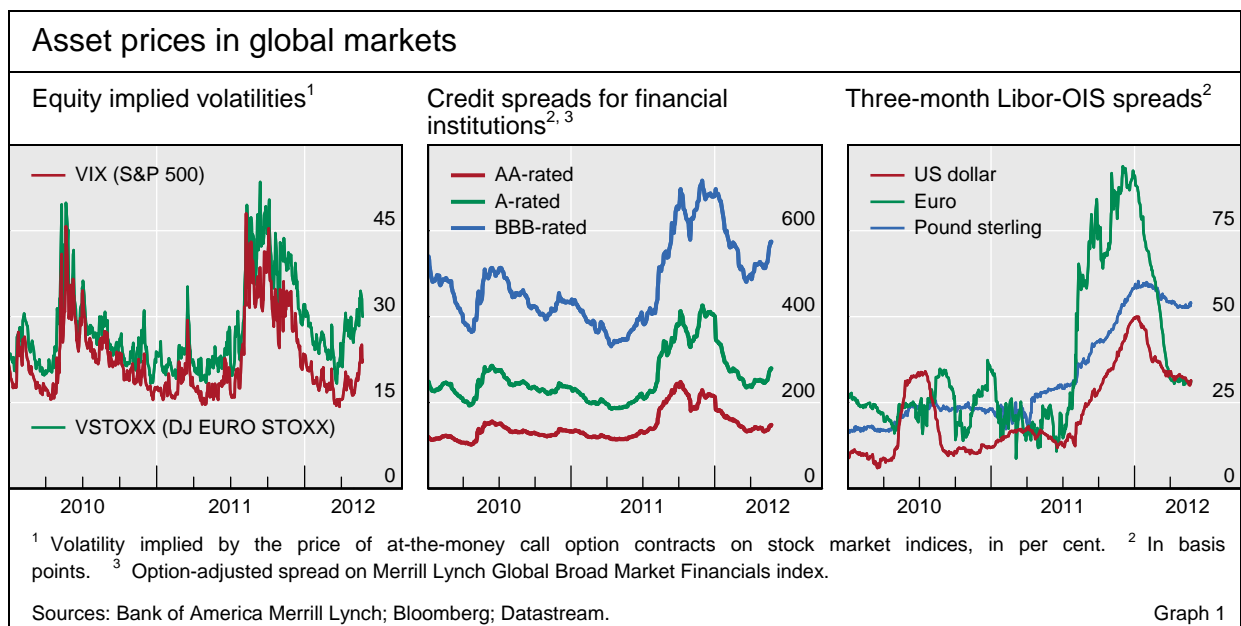
Policy actions spur optimism ...

The improvement was also visible in the primary market for long-term unsecured bank bonds, which reopened temporarily at the beginning of the year. This funding channel had been closed for a large number of euro area banks in the second half of 2011. Many banks from the euro area periphery, however, continued to rely heavily on covered bonds and government-guaranteed bonds for funding (see the box on page 20). The overall benign market conditions in March also helped ensure a smooth completion of the €200 billion Greek debt swap. This took place in the second week of March with very limited impact on other European sovereign bond and credit default swap (CDS) markets. The debt swap triggered payouts on a moderate amount of outstanding CDS written on Greek government bonds. These were settled without difficulty, thus removing earlier investor concerns about the ineffectiveness of hedging sovereign risk via CDS contracts.

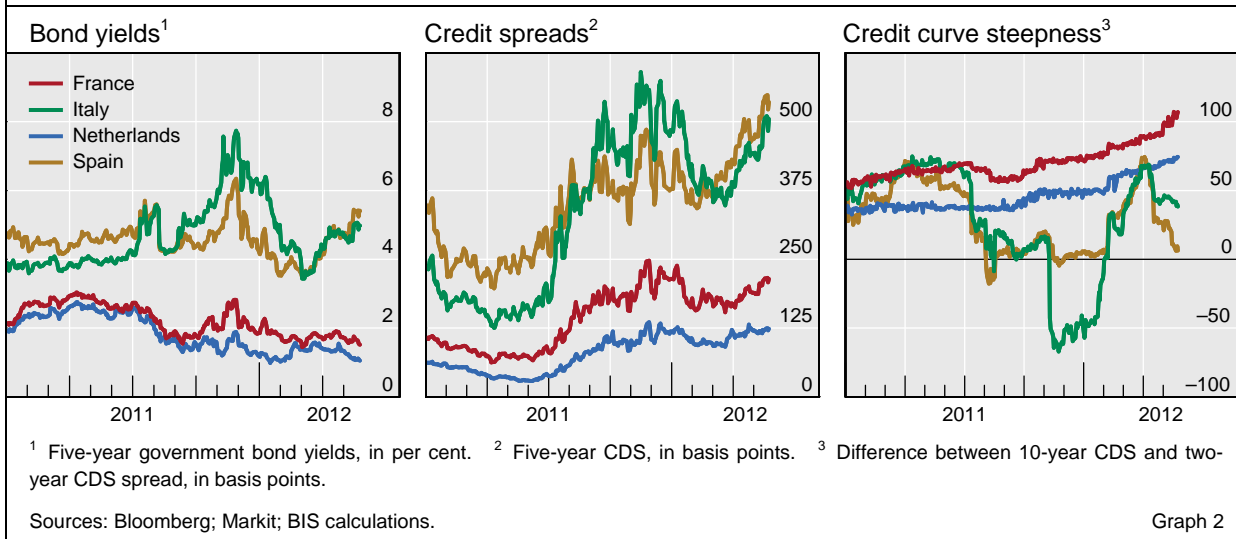
... and ease bank funding conditions

The spurt of euro area optimism driven by policy actions and growth expectations provided temporary relief for policymakers and investors concerned about the outlook for euro area sovereigns. Yields on both Spanish and Italian government bonds declined significantly (Graph 2, left-hand panel).

Italian and Spanish spreads fall



## Euro area sovereign bonds and CDS



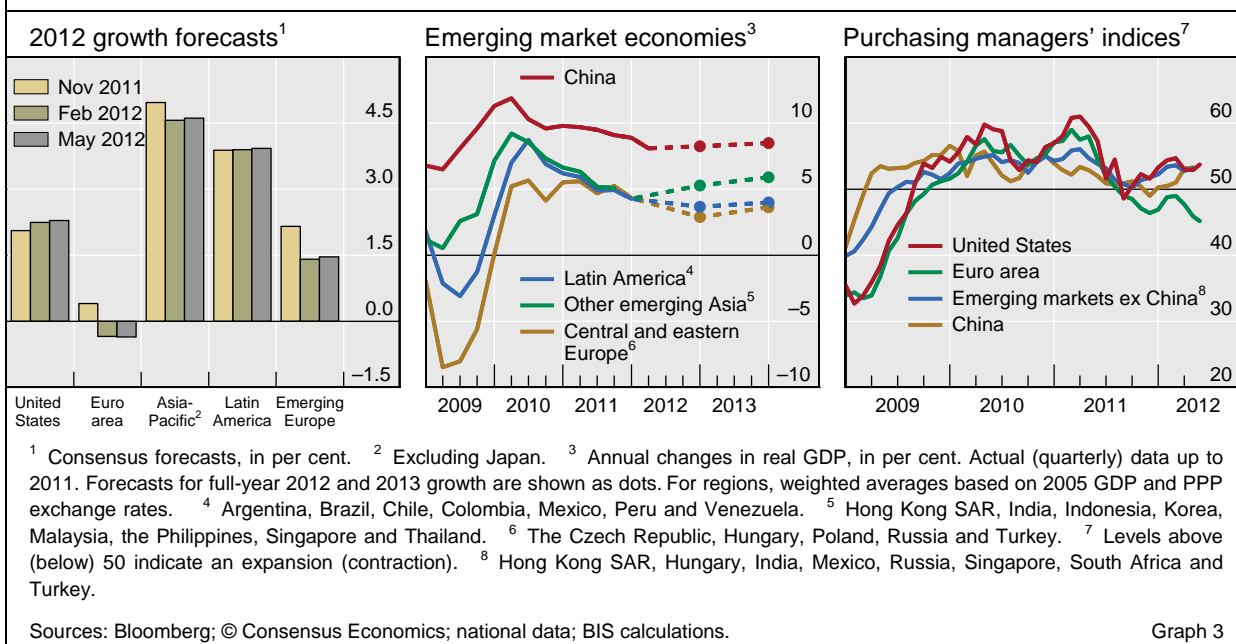
This may in part reflect large bond purchases by Italian and Spanish banks in both primary and secondary markets following the ECB's LTRO. Spanish and Italian sovereign credit spreads also fell as investor fears subsided (Graph 2, centre panel). The more positive view was similarly reflected in the slope of the credit risk curve, which became less flat (Graph 2, right-hand panel). The improvement was particularly strong for Italy, with the Italian credit curve regaining its positive slope after having been inverted during the last two to three months of 2011.

### Improved global economic outlook

Recovery optimism takes hold

As euro area strains eased, market participants focused on the global growth outlook. Positive news about the US economic recovery led market participants

## Global growth outlook and patterns

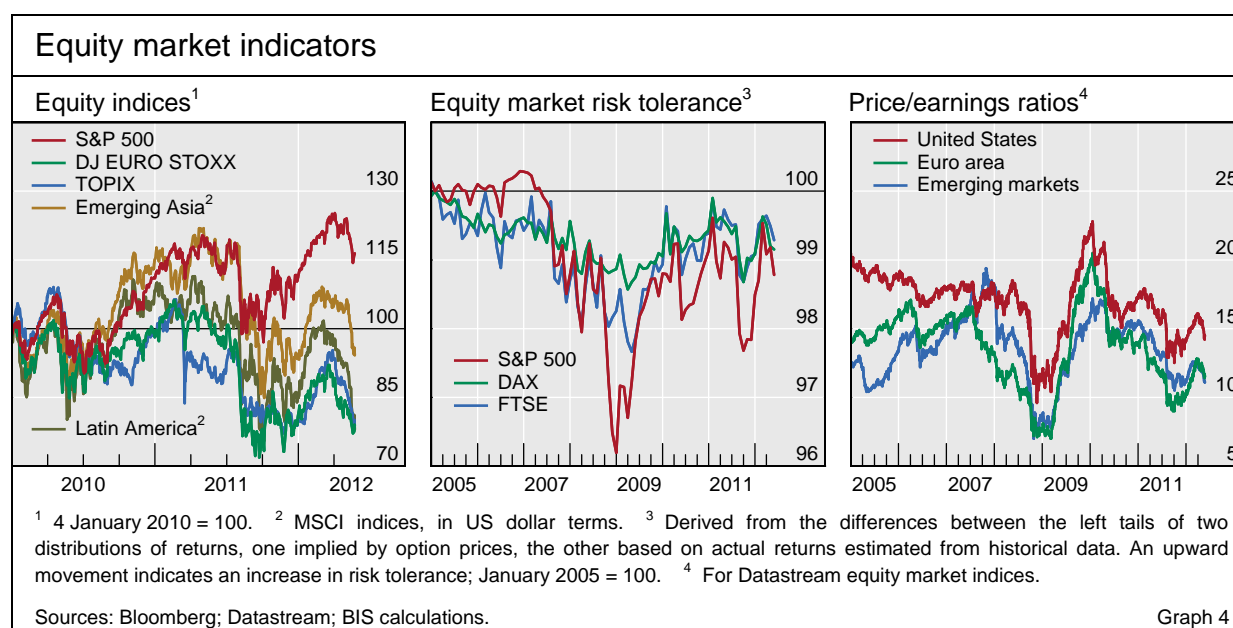


to revise upwards their US growth expectations (Graph 3, left-hand panel). Labour market figures for the US economy, partly reflecting benign weather conditions, also showed signs of improvement. Output growth in Japan recovered moderately, owing to post-earthquake reconstruction. The resilience of growth in major emerging economies (particularly in Asia) likewise supported a more optimistic outlook for the global economy (Graph 3, centre panel).

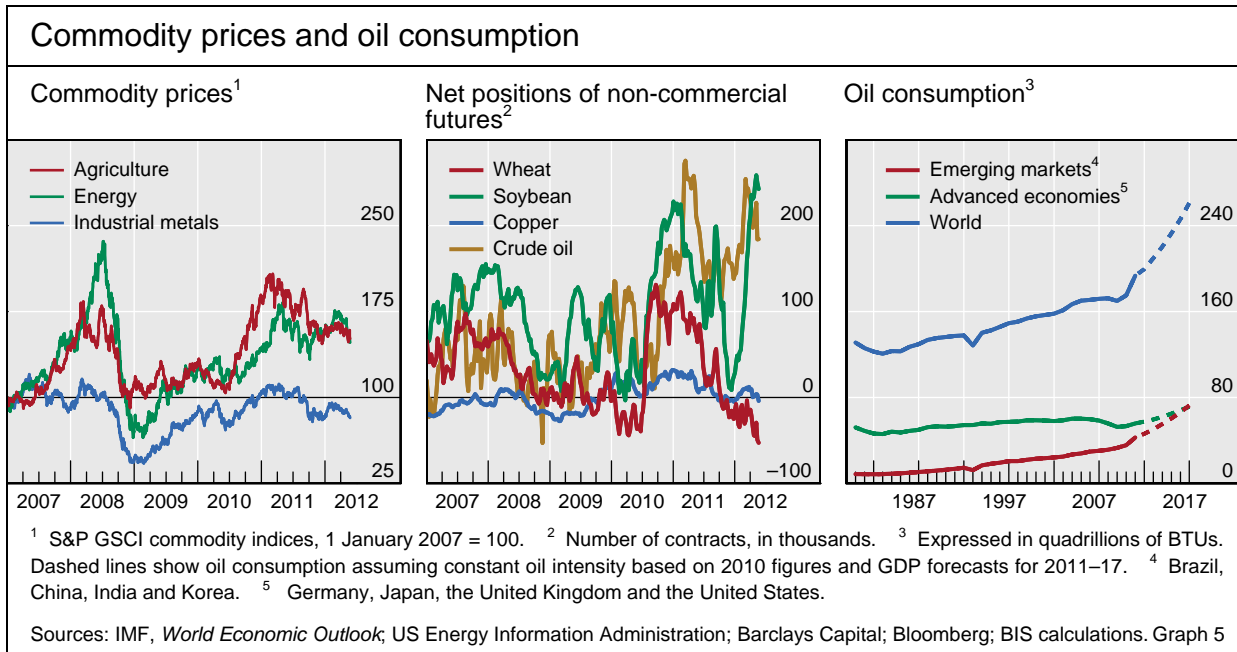
Driven by higher risk appetite and improved growth expectations, equities and other growth- and risk-sensitive assets performed strongly until the end of March. US and Asian equity markets firmed the most, in line with the better macroeconomic outlook for these regions (Graph 4, left-hand panel). The S&P 500 gained about 12% in the first quarter, the largest one-quarter increase for a decade, despite a slowdown in projected earnings increases. Valuation ratios for equity markets in advanced and emerging economies also picked up, recovering from the lows seen in late 2011 (Graph 4, right-hand panel). The discrepancy between changes in valuations and expected earnings suggests that the former were driven mostly by increased investor willingness to take on risk (Graph 4, centre panel). Price/earnings ratios for the US and European markets, however, remained below historical averages, whereas emerging market valuations continued to be close to historical averages.

Optimism about the recovery also had a visible influence on commodity markets, with both energy and industrial metal prices seeing continued upward pressure (Graph 5, left-hand panel). This was primarily due to tight demand and supply constellations, although in the case of oil concerns about potential further supply disruptions and geopolitical risks added to the pressure, and crude oil traded above \$100 per barrel for a large part of the period. The positive outlook and expected higher prices also led financial investors to increase their net long positions in commodities futures for both oil and metals (Graph 5, centre panel). For oil in particular, there was clearly a long-run expectation of continued consumption growth, as demand from China and other emerging economies is expected to remain strong (Graph 5, right-hand

Equities and commodities rise as sentiment improves







panel). In contrast to energy and metals, agriculture price increases were limited due to better expected harvests, particularly for wheat. This should, however, be seen in the context of the historically extremely difficult global weather conditions in previous years.

### Euro area uncertainties return

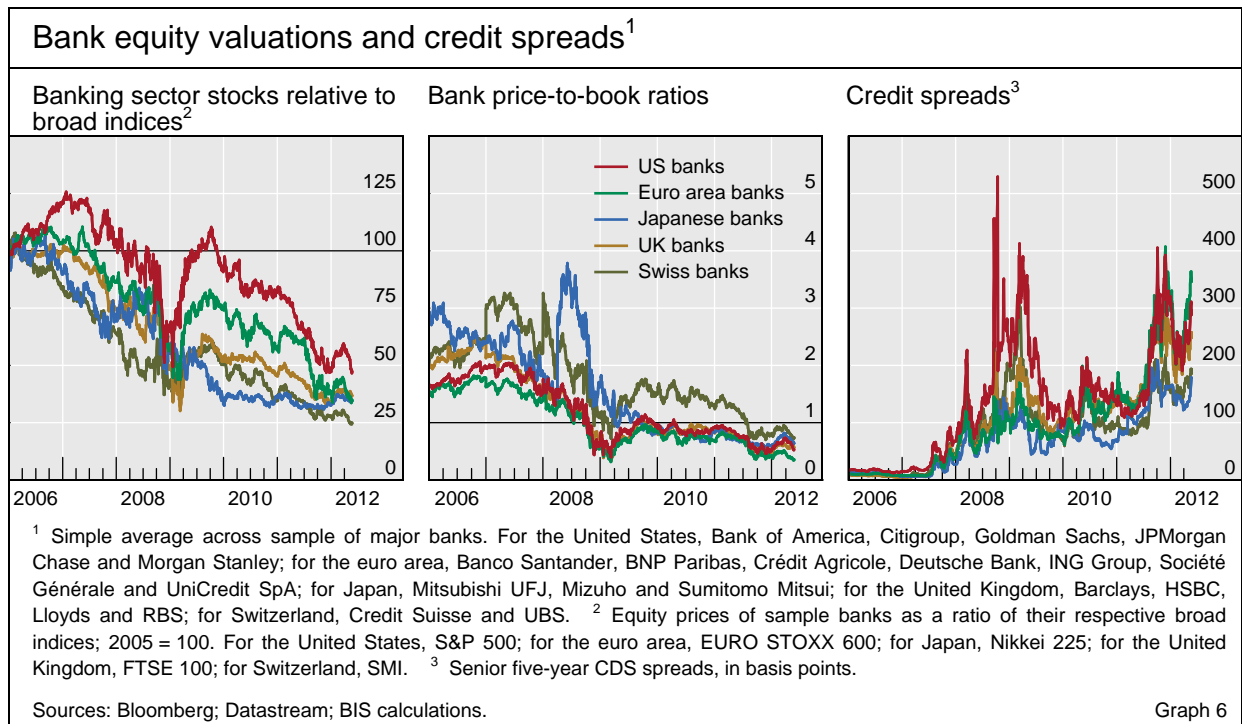
Optimism in financial markets began to evaporate in the second half of March on the back of renewed concerns about euro area growth, especially in Spain and Italy. The mood shifted as it became increasingly clear that monetary policy actions alone would not be sufficient to resolve underlying euro area economic problems. A trickle of weaker than expected economic data cast further doubts on the strength of the global growth recovery.

Spanish and Italian yields rise ...

Fading LTRO market impact, worries about a possible negative short-term growth impact of fiscal consolidation in Spain and the slow pace of labour market and other structural reforms in Italy were reflected in rising sovereign bond yields. Between mid-March and early April, Spanish and Italian yields edged up significantly (Graph 2, left-hand panel). Sovereign spreads against German bunds widened considerably over this period. Early releases of weak euro area purchasing managers' indices (Graph 3, right-hand panel) and less positive business climate surveys also contributed to a somewhat less positive growth picture for France and Germany.

... as worries intensify

Investors also retreated when Standard & Poor's downgraded Spain and several of the country's biggest financial institutions on 26 April. The sovereign rating was lowered two notches to BBB+. This was clearly reflected at a €2.5 billion bond auction on 2 May, with yields surging by around 140 basis points for shorter-term bonds. The change to a more negative outlook for the euro area was also reflected in the early May statement by the ECB, which no longer contained references to inflationary upside risks and described longer-term risks to inflation as broadly balanced.



Fading recovery momentum in the United States added further strains to an already uncertain outlook about the health of the global economy. Weaker than expected data on payroll growth released on 6 April weighed heavily on market sentiment. The March increase of only 120,000 in the early release of US non-farm payroll employment figures was well below expectations and pointed to a still fragile US economic recovery. The strongest market reactions were seen in European equity and bond markets when they reopened after the Easter weekend. The renewed scepticism meant that bond yields in major advanced economies fell to record lows. This most likely reflected a flight to safety by investors combined with expectations of continued accommodative monetary policies in advanced economies. Flight to safety effects also became apparent when Swiss six-month T-bills were sold at a negative yield of 25 basis points on 10 April.

Weaker than expected US recovery ...

Global equity prices began to decline in late March and volatility increased as recovery hopes began to fade and concerns about the European situation resurfaced (Graph 4, left-hand panel). This was in stark contrast to the strong recovery of equity markets early in the year, which had largely been driven by shrinking risk aversion, lower perceived tail risk (Graph 4, centre panel) and the recovery outlook.

... prompts a flight to safety

The resurfacing of uncertainty was reflected in plummeting bank equity prices. Euro area, US and Swiss bank equity prices continued to underperform the broader market (Graph 6, left-hand panel), further depressing market valuations. Most starkly, market capitalisations of euro area bank equity were below 50% of tangible book value at the end of April 2012. Price-to-book ratios for banks have slumped to historical lows in most countries in the aftermath of the crisis, pointing to what could be a structural shift in valuations (Graph 6, centre panel). The low valuation of bank equity no doubt reflects in part

Bank equity prices decline ...

assessments of growth opportunities and earnings potential, which investors consider to be fairly bleak for most banks. There are several additional possible explanations for the significant decline in bank equity valuations. Investor concerns about opaque balance sheets as well as the continued lack of loss recognition and the possible impact of further bank rating downgrades are adding to investor uncertainty, thereby raising risk premia on bank equity. Higher uncertainty and risk perceptions were also reflected in banks' CDS premia, which remained highly elevated for euro area, UK and US banks (Graph 6, right-hand panel).

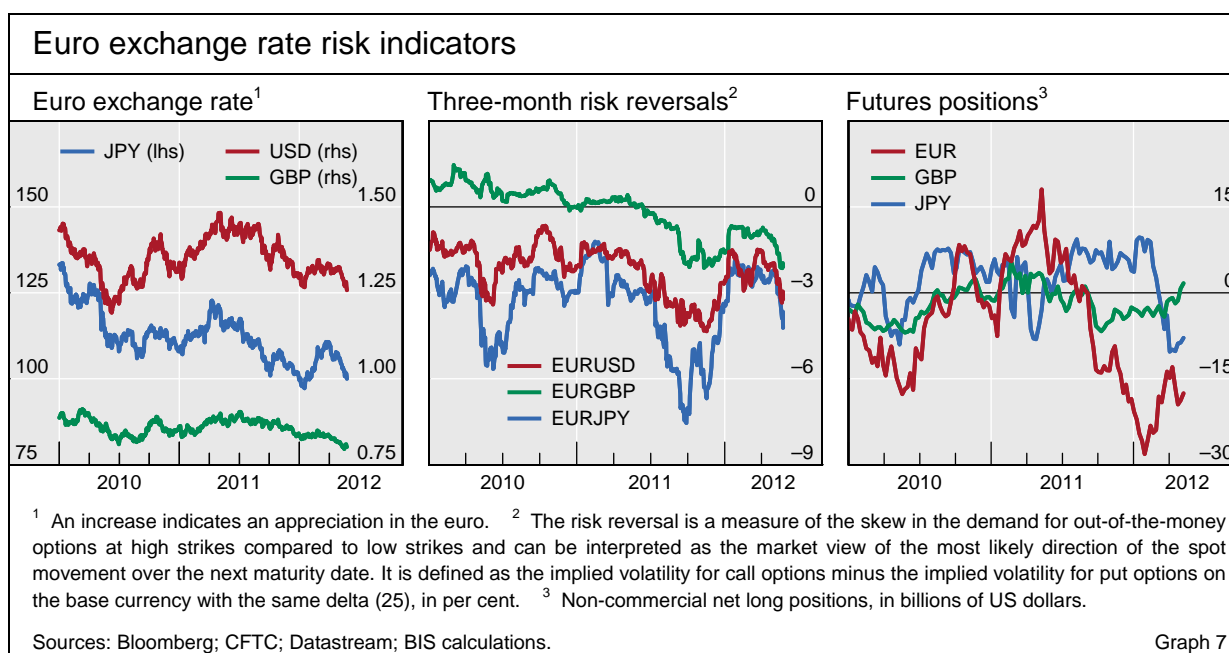
... as uncertainty rises

European banks' issuance of unsecured long-term debt remained positive, but began to taper off again during April. Market conditions nevertheless remained difficult for a number of banks from the euro area periphery which found it difficult to place unsecured debt with investors. Market participants, however, regarded this as less worrisome than during the second half of 2011, most likely in light of the buffers built up by the high bond issuance in the first quarter and the ample longer-term funds provided by the ECB's LTROs. Survey data for the euro area, however, indicated a continued tightening of lending standards and weak demand for bank credit.

*Political uncertainty adds further strains*

Euro area political developments ...

Market developments during May clearly indicated that euro area political events significantly added to investor uncertainty. The new EU fiscal compact is still subject to parliamentary consideration in several countries as well as an Irish referendum (to be held on 31 May). The resignation of the Dutch coalition government on 23 April over budgets added further to the uncertainty, as reflected in the 70 basis point widening of the spread between 10-year Dutch bonds and German government bonds. Initial market reactions to the presidential election in France and the Greek parliamentary election, both held on 6 May, were mixed. Greek and French as well as Asian equity markets



declined. Yields on Greek bonds initially rose by nearly 2 percentage points and other southern European government bonds also experienced yield increases. Equity markets in the rest of Europe and the United States, however, quickly recovered, and an auction of French short-term government bonds went smoothly. In the days that followed, post-election political deadlock in Greece and concerns about Spanish banks added to the uncertain outlook for the euro area. In this challenging environment, investor worries about a possible Greek exit from the euro and potential wider impact intensified.

The most visible initial market reaction was in foreign exchange markets, where the euro started to depreciate against the US dollar (Graph 7, left-hand panel). At the same time, option prices pointed to a sharp increase in perceived depreciation risk for the euro against other major currencies (Graph 7, centre panel). That said, the levels are still quite moderate compared to those in the second half of 2011. At the same time, data on outstanding futures contracts continue to point towards financial investors expecting the euro to weaken (Graph 7, right-hand panel). Positioning data pointed to sterling being used as a hedge against negative euro surprises. Sterling may also have benefited from shifts in currency allocations of sovereign foreign exchange reserves.

... add downside risk

## Emerging market inflows weaken as growth moderates

Concerns about the growth outlook for the advanced economies also prompted investors to reconsider the resilience of emerging market growth.

In China, economic indicators confirmed that growth is gradually slowing as a result of last year's policy tightening and lower external demand. Economic data for April on industrial production, trade, investment, and real estate prices and investment confirmed that the economy decelerated along a manageable path. The combination of slower growth, lower inflation and continued declines in house prices in most Chinese cities prompted the Chinese central bank to quickly lower banks' reserve requirement ratio on 12 May, citing the need to achieve a stable increase in economic growth. The move prompted expectations of further monetary policy easing. Consistent with this, one-year non-deliverable renminbi/US dollar forwards began to price in a mild depreciation of the renminbi against the US dollar during the first half of May.

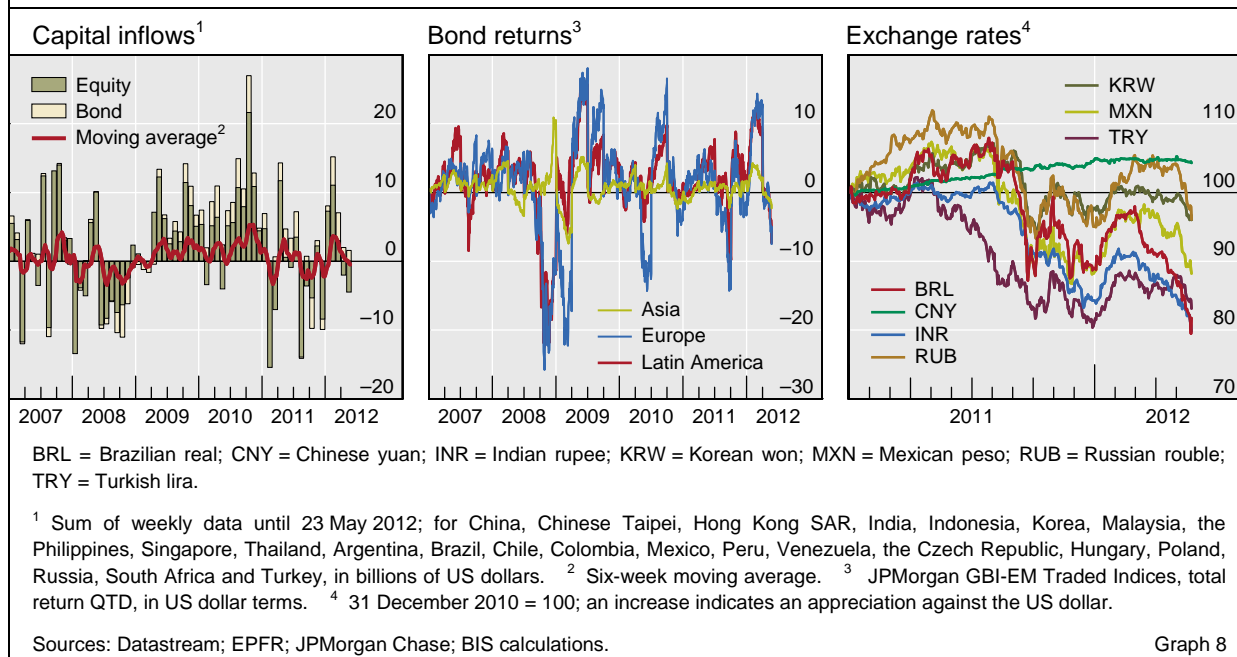
Chinese growth moderates

Economic indicators also pointed to a growth slowdown in Latin America and eastern Europe. Responding to slower growth and easing inflationary pressures, the Central Bank of Brazil cut its policy rate by 75 basis points to 9% in April. This meant that the policy rate is now 300 basis points lower than its recent peak in 2011. This put further downward pressure on the Brazilian real, which depreciated significantly against the US dollar in April (Graph 8, right-hand panel).

After a brief spell of strong capital inflows in the first two months of the year, inflows into emerging market economies slowed down starting in March (Graph 8, left-hand panel). The lower capital inflows were reflected in the returns on emerging market bonds, which declined sharply towards the end of the period, particularly compared to the high returns earlier in the year

Emerging market inflows moderate ...

## Capital flows and asset prices in emerging markets



(Graph 8, centre panel). A similar pattern had prevailed during the latter part of 2011.

... but increase again as uncertainty intensifies

Inflows to emerging market bond funds increased significantly during the first weeks of May as euro area uncertainties returned. In contrast, funds focused on western European bonds saw outflows. Meanwhile, emerging market equity funds were more clearly affected by the less favourable growth outlook, and began to experience outflows during April. Emerging market exchange rates also reflected the change in mood during April and May, with a large number of currencies giving up all their earlier gains relative to the US dollar (Graph 8, right-hand panel).



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## Highlights of the BIS international statistics<sup>1</sup>

*The BIS, in cooperation with central banks and monetary authorities worldwide, compiles and disseminates several data sets on activity in international financial markets. This chapter summarises the latest data for the international banking market (available up to the fourth quarter of 2011) and for the over-the-counter (OTC) derivatives market (available up to the second half of 2011). One box discusses activity in international debt securities markets in the first quarter of 2012, and a second discusses the calculation of uncovered counterparty exposures in global OTC derivatives markets.*

During the fourth quarter of 2011, BIS reporting banks recorded their largest decline in aggregate cross-border claims since the drop in the fourth quarter of 2008, which followed the collapse of Lehman Brothers. The latest decline was worldwide but largely driven by banks headquartered in the euro area facing pressures to reduce their leverage. Overall, cross-border lending to non-banks decreased; but the decline of claims on banks was sharper – and the largest in almost three years.

In developed countries as a whole, total cross-border lending to banks and non-banks contracted by \$630 billion; the most notable exceptions were Japan and Switzerland, where it increased by \$71 billion and \$13 billion, respectively. The decline was led by a significant drop in interbank lending arising from the spillover of the euro area sovereign debt crisis to bank funding markets. The reduction was especially marked for cross-border claims on residents of the euro area and was mostly attributable to euro area banks.

In emerging market economies,<sup>2</sup> cross-border claims of BIS reporting banks fell in most regions, overall by \$75 billion. The decline was concentrated on Asia-Pacific in general and on banks in China in particular. For China, this was the first overall decrease since the opening quarter of 2009. Among all developing countries, only those in Latin America and the Caribbean saw an increase in cross-border claims.

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<sup>1</sup> This article was prepared by Adrian van Rixtel (adrian.vanrixtel@bis.org) for banking statistics and Nicholas Vause (nick.vause@bis.org) for OTC derivatives. Statistical support was provided by Stephan Binder, Serge Grouchko, Branimir Gruić, Carlos Mallo and Denis Pêtre.

<sup>2</sup> “Developing countries” in the Statistical Annex tables.

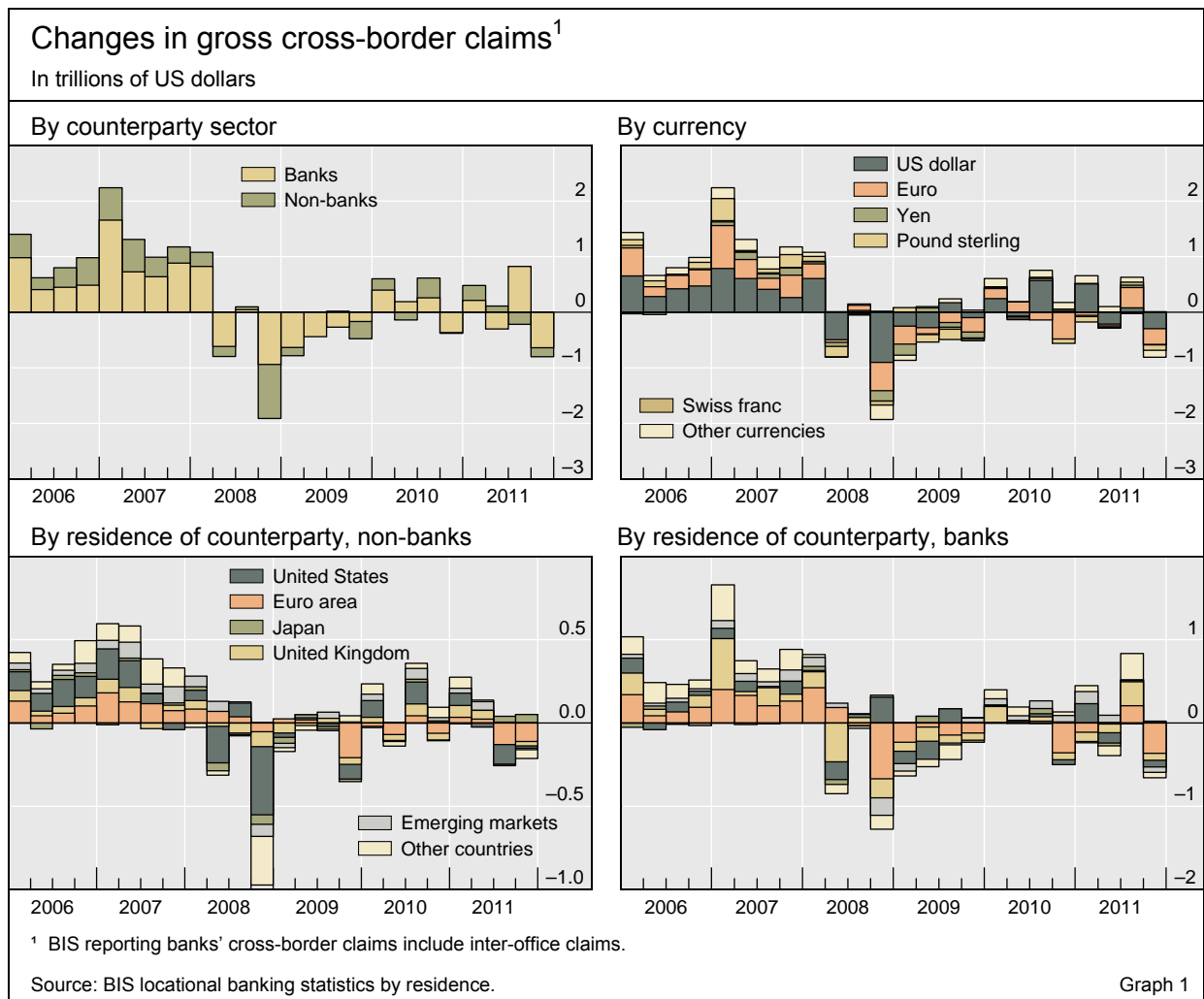
In the OTC market, the notional amount of derivatives outstanding fell 8%, to \$648 trillion, in the second half of 2011, while a rise in price volatility drove up the market value by 40%. Gross credit exposures rose 32%.

The issuance of international debt securities in the first quarter of 2012 made a strong advance over the final quarter of 2011, primarily because of the ECB's offer of three-year collateralised lending to banks (see Box 1).

### The international banking market in the fourth quarter of 2011

The aggregate cross-border claims of BIS reporting banks declined strongly during the fourth quarter of 2011.<sup>3</sup> The overall decrease of \$799 billion (2.5%) was driven mainly by a \$637 billion (3.1%) fall in interbank lending (Graph 1, top left-hand panel). Claims on non-banks contracted by \$162 billion (1.4%). Claims denominated in all the major currencies fell, except for the yen (Graph 1, top right-hand panel).

Aggregate cross-border claims decline



<sup>3</sup> The analysis in this section is based on the BIS locational banking statistics by residence, in which creditors and debtors are classified according to their residence (as in the balance of payments statistics), not according to their nationality. All reported flows in cross-border claims have been adjusted for exchange rate fluctuations and breaks in series.



### *Decline in claims on non-banks*

Cross-border claims on non-banks (ie entities other than banks) declined in most of the major developed countries (Graph 1, bottom left-hand panel). As in the previous quarter, the bulk of the decrease at non-banks was in the euro area (\$110 billion or 3%). Residents of France accounted for \$42 billion of this decrease, followed by those of Belgium (\$20 billion), the Netherlands (\$17 billion), Italy (\$12 billion) and Spain (\$8 billion). Claims on non-banks also fell considerably in the United Kingdom (\$26 billion or 2.4%) and in the United States (\$14 billion or 0.6%). In line with the previous quarter, the only major economy with a significant increase in cross-border claims on its non-banks was Japan (\$51 billion or 20%).

### *Sharp drop in cross-border interbank lending*

Cross-border claims on banks decline in almost all euro area countries ...

Three features characterise the sharp decline in cross-border claims on banks in the fourth quarter. First and foremost, internationally active banks reduced their cross-border lending to banks in the euro area. Second, they also reduced cross-border interbank lending in several other developed countries, albeit by a lesser amount. Third, they cut interbank loans much more than other instruments.<sup>4</sup>

Cross-border claims on banks located in the euro area fell by \$364 billion (5.9%), which is equivalent to 57% of the decline in global cross-border interbank lending during the quarter. It was the largest contraction in cross-border claims on euro area banks, in both absolute and relative terms, since the fourth quarter of 2008. Cross-border lending to banks located on the euro area periphery continued to fall significantly. Lending to banks in Italy and Spain shrank, by \$57 billion (9.8%) and \$46 billion (8.7%), respectively, while claims on banks in Greece, Ireland and Portugal also contracted sharply. Nonetheless, exposures to these five countries accounted for only 39% of the reduction in cross-border interbank lending to the euro area. BIS reporters also reduced their cross-border claims on banks in Germany (\$104 billion or 8.7%) and France (\$55 billion or 4.2%).

... and the United States and United Kingdom

Cross-border interbank lending to most other major economies also fell during the period but generally to a lesser extent – to banks located in the United States by \$80 billion (2.7%); to those in the United Kingdom by \$84 billion (2.1%) (Graph 1, bottom right-hand panel); and to those in Australia by \$32 billion (11%). Such lending to banks located in offshore centres fell by \$54 billion (2.1%).

Sharp decline in interbank loans drives reduction in interbank claims

The strong contraction in cross-border claims on banks was concentrated in *interbank loans*. These declined by \$524 billion (3.2%), accounting for 82% of the total global decrease. *Other assets* accounted for 11% of the decline,

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<sup>4</sup> BIS locational banking statistics by residence divide the international claims of reporting banks into three instrument categories: *loans and deposits*, *debt securities* and *other assets*. The last category includes equity, participations, derivative instruments, working capital supplied by head offices to branches and residual on-balance sheet claims. For further details, see *Guidelines to the international locational banking statistics*, [www.bis.org/statistics/locbankstatsguide.pdf](http://www.bis.org/statistics/locbankstatsguide.pdf).

and *debt securities* for 7%. In contrast, in the previous quarter, *other assets* was the leading instrument category, possibly because of changes in the market value of derivatives positions. The fall in interbank loans was more pronounced in the euro area (at 6.3%). This development may be seen as part of the marked spillover effects from the euro area sovereign debt crisis to bank funding markets, including short-term interbank markets, in the fourth quarter of 2011. During that quarter, the three-month Libor-OIS spread increased to high levels on the back of higher risk premia and the growing reluctance of market participants to engage in interbank loan transactions. This spread also increased for US dollar and sterling interbank loans, although to a lesser extent. *Interbank loans* declined significantly for banks in the United States (\$81 billion or 3.1%) and the United Kingdom (\$63 billion or 2%).

In contrast, the cross-border interbank market generated modest amounts of new funds, mainly for banks in Japan (Graph 1, bottom right-hand panel) and Switzerland. Claims on banks in Japan rose by \$21 billion (3.5%), and claims on those in Switzerland by \$14 billion (2.9%); again, in each case, the increase in claims came mainly from the rise in *interbank loans* – \$23 billion (4.0%) and \$20 billion (4.7%), respectively.

Cross-border claims on banks in Japan and Switzerland expand

#### *Deleveraging European banks reduce cross-border positions<sup>5</sup>*

In the fourth quarter of 2011, the strains of the euro area sovereign debt crisis started to spread from bank wholesale funding markets to the assets side of the institutions' balance sheets.<sup>6</sup> This raised interest among market observers as to how banks from individual countries were being affected, including their cross-border positions denominated in various currencies. Both dimensions – nationality and currency denomination – may be assessed through the BIS locational banking statistics by nationality.<sup>7</sup> Banks headquartered in developed European economies reduced their cross-border assets by \$466 billion (2.3%), the second largest decline in both absolute and relative terms since the fourth quarter of 2008.

European banks slash cross-border lending ...

This cutback was more marked for euro area banks, at \$584 billion (4.7%). Banks with head offices in France lowered their cross-border assets by \$197 billion (5.3%), mostly by reducing positions denominated in the euro – after the 7.1% drop in the previous quarter, it was the second largest for French banks in at least 12 years. The cross-border lending of banks in some other major European economies declined significantly as well: ranked by percentage point change, the drop was \$35 billion (5.3%) in Spain; \$181 billion

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<sup>5</sup> The analysis in this section is based on the BIS locational banking statistics by nationality.

<sup>6</sup> See “European bank funding and deleveraging”, *BIS Quarterly Review*, March 2012, pp 1–12.

<sup>7</sup> The BIS statistics by nationality cover activity according to the country of incorporation or the country in which the ultimate parent/company is chartered. The organising principle is thus the nationality of the controlling interest rather than the residence of the operating unit. These statistics also allow for currency breakdowns of international positions, which is not possible with the consolidated banking statistics (which are also organised according to the nationality of reporting banks). For more details, see *Guidelines to the international locational banking statistics*, [www.bis.org/statistics/locbankstatsguide.pdf](http://www.bis.org/statistics/locbankstatsguide.pdf).

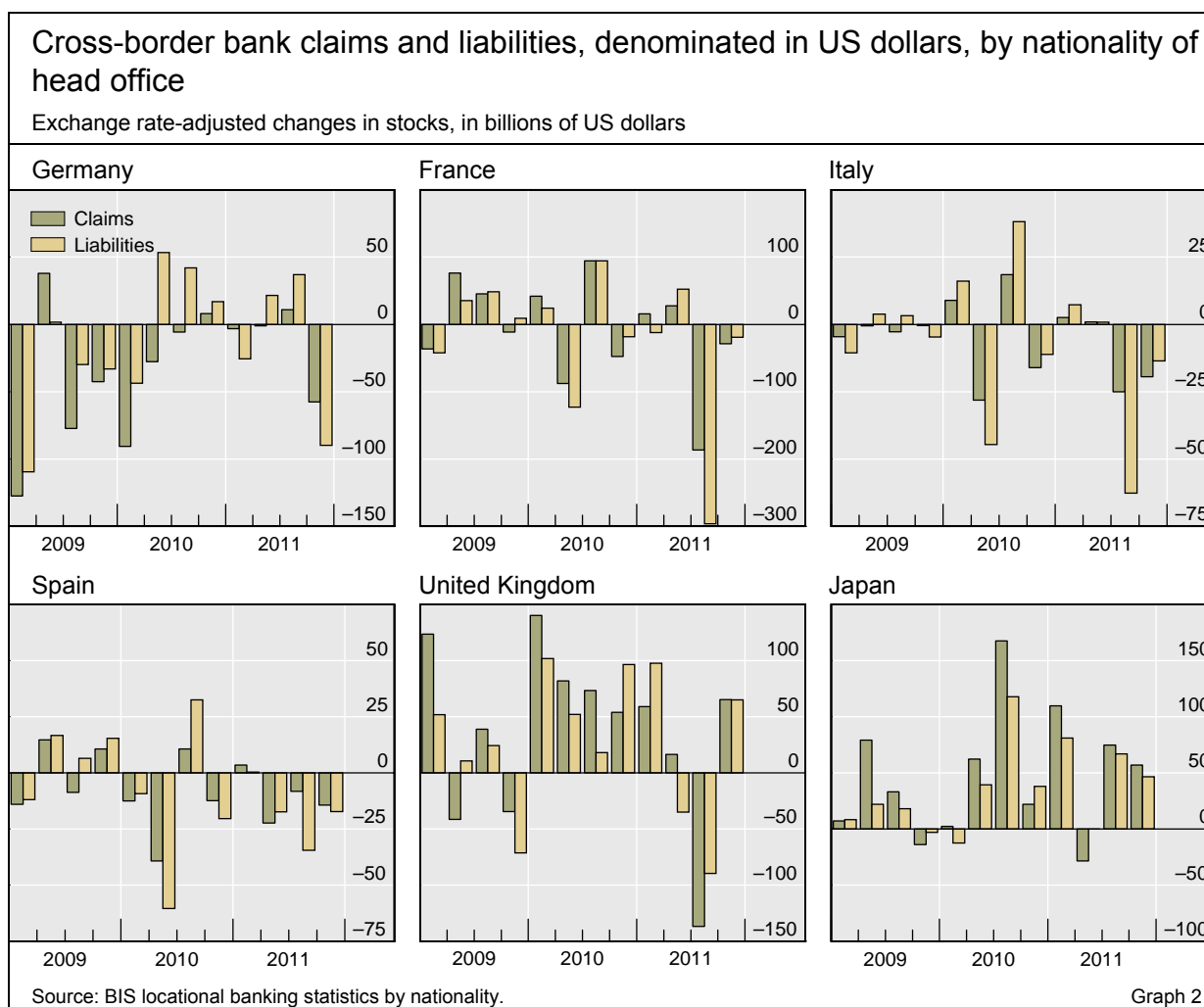
(4.7%) in Germany; and \$32 billion (3.5%) in Italy. In contrast, the cross-border lending of UK banks increased slightly (\$7 billion or 0.2%).

... as well as cross-border funding

Funding, another dimension of BIS reporting banks' cross-border positions, fell sharply in the fourth quarter of 2011. For banks in the developed European economies, funding dropped \$602 billion (3.1%); for euro area banks, the decline was even larger at \$681 billion (5.9%). Among banks headquartered in the main European economies, the strongest declines in cross-border liabilities were in Spain (\$81 billion or 9.0% – the largest drop in more than 17 years) and Italy (\$68 billion or 8.0% – the largest in more than nine years). Those headquartered in France cut such funding by \$208 billion (6.2%) and those in Germany by \$185 billion (5.8%). In contrast, cross-border liabilities rose for banks headquartered in the United Kingdom and by even more for those in Japan; the gains may be related to perceptions of those countries as safe havens amid the continuing severity of the euro area sovereign and banking crises.

Partial easing of US dollar tensions for French, Italian and Spanish banks

At the same time, although the US dollar segment of the cross-border funding market continued to drop for banks headquartered in France (\$19 billion), Italy (\$14 billion) and Spain (\$17 billion), the decline was markedly slower than in the previous quarter (Graph 2) (\$296 billion, \$63 billion and \$34 billion, respectively). This improvement was supported by the action



coordinated by the Federal Reserve with several other main central banks on 30 November to lower the price of dollar funding through US dollar swap arrangements. Federal Reserve data show a strong increase in US dollar swaps with other central banks in December 2011.<sup>8</sup>

*Foreign bank lending to the euro area periphery continues to contract<sup>9</sup>*

The consolidated foreign claims of BIS reporting banks on counterparties in Greece, Ireland, Italy, Portugal and Spain continued to drop substantially (Graph 3). Calculated at constant exchange rates, foreign claims on residents contracted by \$126 billion (5.7%).<sup>10</sup> Foreign claims on the public sector dropped by \$54.1 billion (14%) and on banks by \$54.5 billion (13%); for the previous quarter, those claims fell \$63 billion and \$43 billion, respectively. The declines may stem in part from the effect of the euro area sovereign debt crisis on the banking sector. Foreign lending to the non-bank private sector declined by \$17 billion (1.3%), a larger drop than in the previous quarter.

BIS reporting banks reduced their exposures to all sectors in each of the five euro area peripheral countries. Although the composition of the contraction varied considerably by country, the pattern from the previous quarter was largely repeated in Greece, Italy and Spain. The overall drop in foreign lending to Greece (\$11 billion or 10%) and Italy (\$55 billion or 6.8%) involved primarily their public sectors – \$7.8 billion (24%) in Greece, and \$32 billion (14%) in Italy. The drop in foreign claims on Spain (\$48 billion or 7.2%) affected largely its banking sector (\$31 billion or 16%).

In contrast, the fourth quarter decline in foreign lending to Ireland (\$7.5 billion or 1.7%) was concentrated on recipient banks (\$4.9 billion or 6.7%), whereas the non-bank private sector bore the brunt of the contraction in the previous quarter. And the decrease in foreign claims on Portugal (\$3.7 billion or 2.0%) involved mainly the non-bank private sector (\$2.5 billion or 2.0%), a shift from the third quarter's concentration on the banking sector.

On the lender side, euro area banks accounted for most of the reduction in foreign claims on the five peripheral countries (\$105 billion or 6.7%). French banks alone accounted for more than half of that decline (\$55 billion or 8.9%). In contrast, US banks modestly increased their foreign claims on the five countries through larger exposures to banks and lower outward risk transfers

Foreign claims on euro area peripheral countries decline

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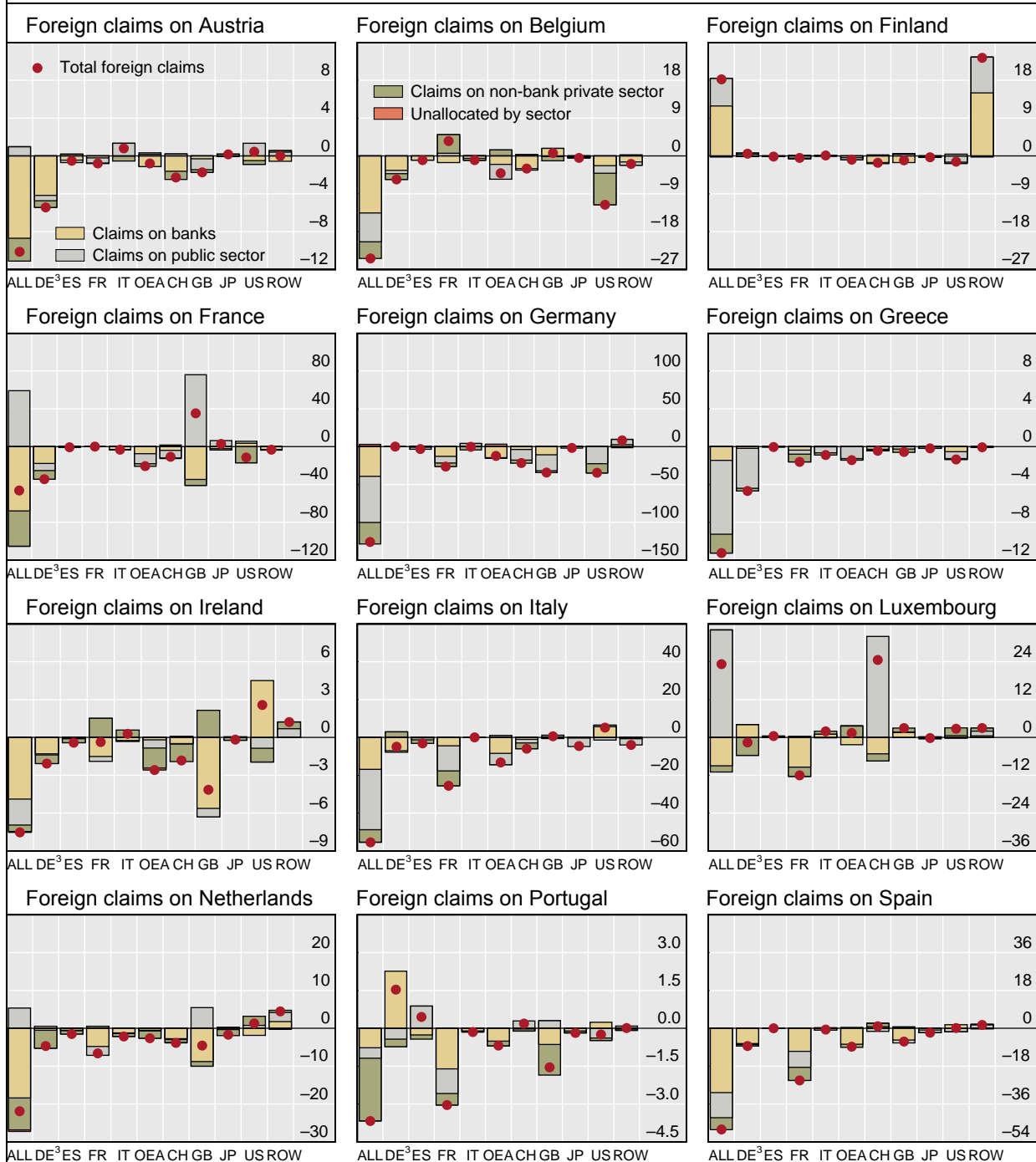
<sup>8</sup> According to the data, the swaps rose from \$2.4 billion at end-November to \$99.8 billion at 28 December and then declined to \$26.7 billion on 9 May.

<sup>9</sup> The analysis in this section is based on the BIS consolidated international banking statistics on an ultimate risk basis. In this data set, the exposures of reporting banks are classified according to the nationality of banks (ie according to the location of banks' headquarters), not according to the location of the office in which they are booked. In addition, the classification of counterparties takes into account risk transfers between countries and sectors (for a more detailed discussion and examples of risk transfers, see *BIS Quarterly Review*, March 2011, pp 16–17).

<sup>10</sup> To adjust for the period's currency fluctuations, we assume that all foreign claims on residents of the euro area are denominated in euros.

# Estimated changes in foreign claims<sup>1</sup> on selected countries, Q4 2011

By bank nationality at constant end-2011 exchange rates,<sup>2</sup> in billions of US dollars



ALL = all BIS reporting banks; CH = Switzerland; DE = Germany; ES = Spain; FR = France; GB = United Kingdom; IT = Italy; JP = Japan; OEA = other euro area; ROW = rest of the world; US = United States.

<sup>1</sup> Foreign claims consist of cross-border claims and of local claims of foreign affiliates; claims of locally headquartered banks are not included, as these are not foreign claims. <sup>2</sup> All claims are assumed to be denominated in euros. <sup>3</sup> Claims of German banks are on an immediate borrower basis, except for their claims on the Greek public sector, which are on an ultimate risk basis.

Source: BIS consolidated banking statistics (ultimate risk basis).

Graph 3

(in particular, reduced third-party guarantees on US banks' foreign claims on Ireland), and despite a decline in US bank claims on each of these countries' public sectors.

### *Cross-border claims on emerging market economies decline<sup>11</sup>*

Claims on the residents of emerging market economies from banks located in other countries contracted by \$75 billion (2.4%), following a decline of \$17 billion (0.5%) in the previous quarter. As it was only the second decline in almost three years, the drop in claims highlighted the scope of the deleveraging in cross-border business activities during the period. The reductions in these claims by banks in the euro area, Asian offshore centres and Japan were especially large and were only modestly offset by slight increases in cross-border lending from other areas, mostly the United Kingdom and the United States.

The contraction was mainly driven by a sharp reduction in interbank claims of \$64 billion (3.8%), more than half of which was focused on China. Cross-border claims on non-banks declined by \$10 billion (0.7%). Claims on residents in the Asia-Pacific region, emerging Europe, and Africa and the Middle East all fell. The only region with an increase was Latin America and the Caribbean.

The largest decline in cross-border credit in developing areas was in the Asia-Pacific region, accounting for 91% of the total reduction for developing countries (Graph 4, top left-hand panel). In fact, it was the first decrease in cross-border claims on the region since the first quarter of 2009. The \$68 billion (5.1%) overall decline was due to a \$70 billion (7.9%) drop in interbank claims, while lending to non-banks increased modestly by \$1.6 billion (0.3%). The decline in cross-border claims in the region originated for the most part from banks in Asian offshore centres, eg in Hong Kong SAR and Singapore, followed by banks in France, Japan and the United Kingdom.

A large drop in cross-border lending to China of \$31 billion (6.1%) – the first decline there since the first quarter of 2009 – was the main factor behind the contraction of cross-border claims in the Asia-Pacific region. The contraction for Chinese banks was \$37 billion (9.9%), whereas cross-border claims on the Chinese non-bank sector increased by \$5.9 billion (4.4%).

Cross-border credit also declined significantly in Chinese Taipei (\$8.8 billion or 8.9%), Korea (\$7.4 billion or 3.5%), Thailand (\$7.2 billion or 14.7%) and India (\$7.1 billion or 3.4%); in all these cases, the change was mainly driven by often sharp decreases in interbank claims.

Also, cross-border lending to emerging Europe and to Africa and the Middle East declined (Graph 4, bottom panels). Claims on the former fell by \$14 billion (1.9%), mainly because of a significant decline in cross-border interbank lending (\$11 billion or 2.6%). The contraction in cross-border claims on emerging Europe mostly affected Hungary (\$6.9 billion or 9.9%) and Poland (\$5.1 billion or 4.0%), and the source of the reduction was in largest part banks in Austria, France and the Netherlands. In contrast, Russia experienced an \$8.0 billion (5.4%) increase in cross-border credit evenly split between its bank and non-bank sectors. Africa and the Middle East recorded a decline of

Cross-border lending to Asia-Pacific declines ...

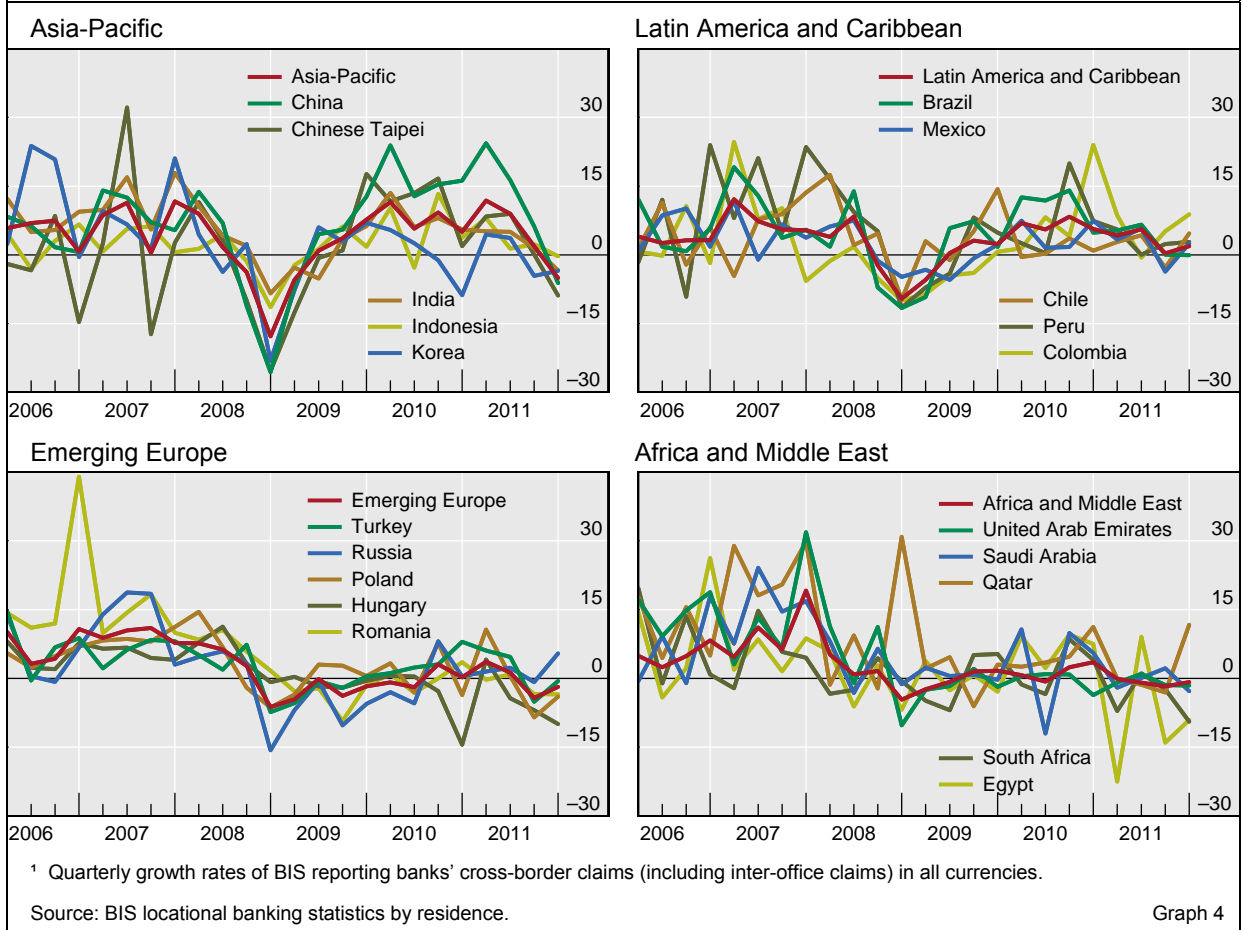
... and also to emerging Europe, and Africa and the Middle East ...

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<sup>11</sup> The analysis in this section is based on the BIS locational banking statistics by residence. See footnote 3 for a description of this data set.

## Growth rates of cross-border claims on residents of emerging markets<sup>1</sup>

By residence of counterparty, in per cent



\$4.1 billion (0.8%) that was concentrated in South Africa, Israel and Saudi Arabia. Cross-border lending to Qatar rose.

... while cross-border lending to Latin America and the Caribbean increases

In Latin America and the Caribbean, the rise in cross-border lending (\$11 billion or 2%) was driven by a \$10 billion (4.3%) gain in interbank lending. The main recipient countries were Mexico (\$3.0 billion or 2.4%) and Chile (\$2.5 billion or 4.7%); the gain in Mexico was more than accounted for by a \$4.0 billion or 13% increase in interbank credit. Banks in the United States and Canada were mainly responsible for the growth in cross-border claims on Latin America and the Caribbean, while Japanese banks reduced their exposure.

## Box 1: International debt security issuance in the first quarter of 2012

Andreas Schrimpf

Issuance of international debt securities picked up strongly in the first quarter of 2012. The rise was largely driven by the impact of the ECB's three-year collateralised LTROs (longer-term refinancing operations), which helped to avert a funding crisis in the European banking sector. By improving market confidence, the ECB's policy action was influential in reopening the primary markets for debt securities for euro area financial institutions.

Global gross issuance of international debt securities reached \$2,562 billion, a 40% increase over the previous quarter (Graph A1, left-hand panel) and the strongest since Q2 2008. With repayments up by only 20%, to \$1,865 billion, during the first quarter, net issuance of international debt securities climbed to \$696 billion. This exceeds the amount of net issuance during the entire second half of 2011 (\$428 billion).

Issuers headquartered in Europe were the most active borrowers during the period, raising \$240 billion net, more than doubling the previous quarter's net borrowing. Borrowers of US nationality raised \$97 billion net, also a notable increase relative to \$57 billion during the final quarter of last year. Borrowers in emerging markets issued \$122 billion net in international debt securities, the largest quarterly amount since the inception of the BIS statistics. International institutions (mostly multilateral development banks) also raised significant amounts worth \$140 billion net.

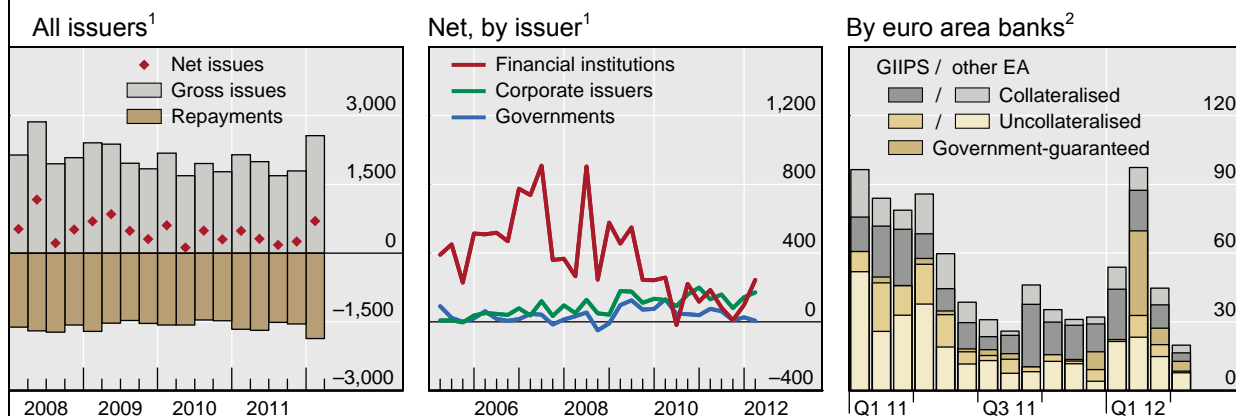
The first quarter saw many financial corporations tapping international debt markets (Graph A1, centre panel). At \$385 billion of net issuance, borrowing by financial corporations outstripped that by non-financial firms (\$167 billion). European financial firms were particularly active, with \$200 billion in net issues of international debt securities. In that market, US financial corporations borrowed much less (\$17 billion net), whereas US non-financial corporations continued their trend of strong activity, raising \$80 billion net.

Wholesale funding conditions for European banks eased considerably following the first of the ECB's three-year LTROs, in late December 2011. Overcoming their lockout from the market towards the end of 2011, European banks returned with a significant amount of debt issuance to take advantage of more benign market conditions.

Importantly, the composition of the newly issued debt by European banks changed (Graph A1, right-hand panel). For long periods in the second half of 2011, much of the debt issuance by European banks had been confined to covered bonds, as unsecured bond funding was available only for top-rated banks and banks headquartered in jurisdictions with a AAA sovereign credit

### Debt securities issuance

In billions of US dollars



<sup>1</sup> International debt securities. <sup>2</sup> Gross issues of bonds by banks headquartered in Greece, Ireland, Italy, Portugal and Spain (GIIPS) or in other euro area (EA) countries. Collateralised debt is mainly covered bonds but also includes smaller amounts of other bonds and asset-backed securities.

Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS.

Graph A1



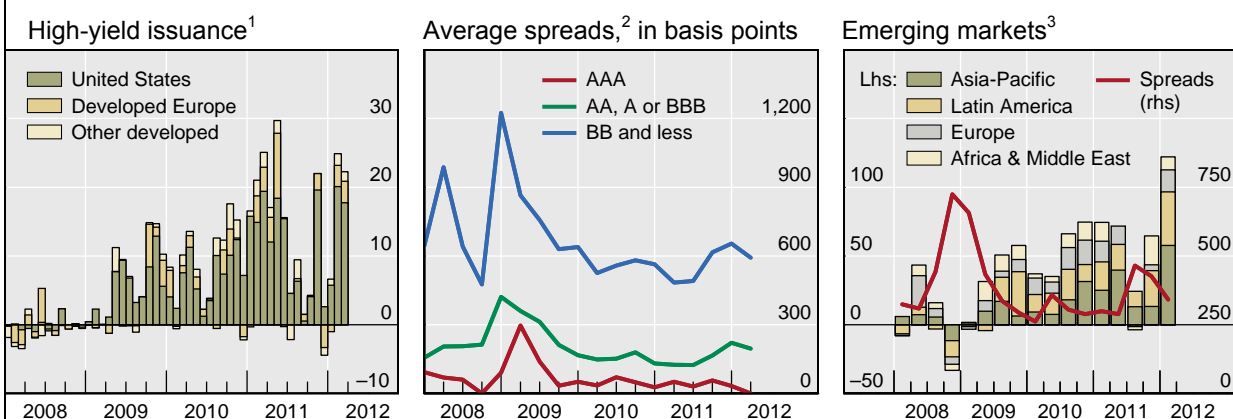
rating. It was primarily high-rated European banks (such as ABN AMRO, Rabobank, Nordea and SEB) that reopened the market for senior unsecured bonds at the beginning of January. Lower-tier names and banks headquartered in peripheral countries followed suit and began to issue senior unsecured bonds.

Nevertheless, issuance in the senior unsecured segment was still fairly concentrated in banks from core euro area countries. Debt issuance by banks in non-core countries to a large extent still consisted of covered bonds and government-guaranteed bonds.

As investors demanded lower risk compensation and as sentiment improved after the ECB's first three-year refinancing operation, issuance activity in the high-yield bond market segment again picked up to satisfy investors' increased risk appetite (Graph B1, left-hand panel). Spreads in the high-yield segment had moved up towards the end of 2011 in the face of the uncertainty around the euro area sovereign debt woes, but they came down somewhat as sentiment improved at the beginning of the year (Graph B1, centre panel). Activity in the high-yield bond market was dominated by US corporations, which issued high-yield debt securities worth \$44 billion after repayments, most of it in February and March.

Emerging market borrowing was also very strong (Graph B1, right-hand panel). Borrowers from Asia and the Pacific tapped international debt markets with \$58 billion of net issues, most of it attributable to borrowers in China (\$33 billion) and Korea (\$9 billion). Borrowing from issuers headquartered in Latin America also rose, to \$39 billion of net issues, mostly because of activity by entities from Brazil (\$28 billion) and Mexico (\$7 billion).

## International debt securities



<sup>1</sup> Net issues by non-financial corporations headquartered in developed countries, in billions of US dollars. <sup>2</sup> Weighted average, rating at issue. <sup>3</sup> Net issues, in billions of US dollars. Spreads are based on the Quarterly JPMorgan EMBI Global Composite index, in basis points.

Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS.

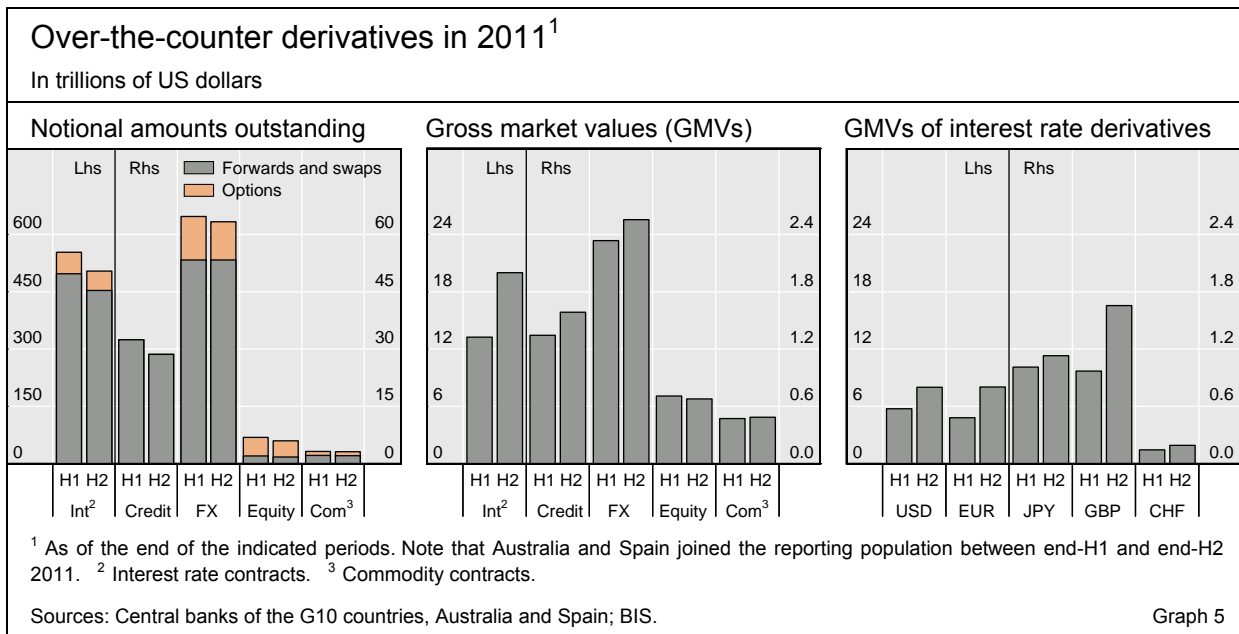
Graph B1

## Over-the-counter derivatives in the second half of 2011

OTC derivatives positions declined, yet rose in value

The notional amount of outstanding over-the-counter (OTC) derivatives fell by 8%, to \$648 trillion, in the second half of 2011. But with an increase in price volatility, their market value rose by 40% (Graph 5, left-hand and centre panels).<sup>12</sup> Gross credit exposures also increased significantly, by 32%.

<sup>12</sup> The reporting population increased in the middle of 2011 to include derivatives dealers in Australia and Spain. Excluding those dealers, reported outstanding notional amounts fell to \$635 trillion at the end of 2011, and gross market values increased to \$26.6 trillion rather than \$27.3 trillion. Reported positions with counterparty groups changed more significantly, as positions with the additional dealers moved from being positions with "other financial institutions" (or "banks and security firms" in the case of the credit derivatives statistics) to positions with "reporting dealers".



The bulk of these changes were in the interest rate market segment. Here, notional amounts outstanding declined by 9%, to \$504 trillion. This corresponded closely to cuts to positions in dollar, euro and sterling contracts and to positions with residual maturities of one year or less. Market participants may have perceived little near-term risk of changes in short-term interest rates in these currencies and therefore elected not to replace maturing short-dated contracts. Such a perception would be consistent with the declines in probabilities of near-term increases in policy rates implied by market prices and the proximity of these rates to zero, which limited the scope for cuts. The increase in the market value of outstanding interest rate derivatives was also concentrated in dollar, euro and sterling contracts, for which replacement values increased by 39%, 67% and 71%, respectively (Graph 5, right-hand panel). For each of these currencies, swap rates of all maturities fell to low levels by historical standards. This suggests that swap rates moved further away from those prevailing when many outstanding contracts were signed, thus raising their cost of replacement.

This was reflected in interest rate derivatives ...

The pattern of lower outstanding notional amounts but higher market values was also visible in the credit derivatives market segment. The volume of outstanding positions, which fell by 12%, to \$29 trillion, resumed the downward trend that began at the end of 2007. The trend largely reflects the application of portfolio compression services to both bilateral and centrally cleared trades. Even after such compression, outstanding positions with central counterparties (CCPs) still increased from 9% to 11% of the market.<sup>13</sup> The market value of outstanding positions increased by 18%, as credit default swap premia increased for many sovereigns and other reference entities.

... and credit derivatives

<sup>13</sup> After halving the volume of contracts with CCPs, since central clearing replaces original contracts between two counterparties with two contracts, one between the first original counterparty and the CCP and another between the CCP and the second original counterparty.

## Box 2: Uncovered counterparty exposures in global OTC derivatives markets

*Jacob Gyntelberg and Nicholas Vause*

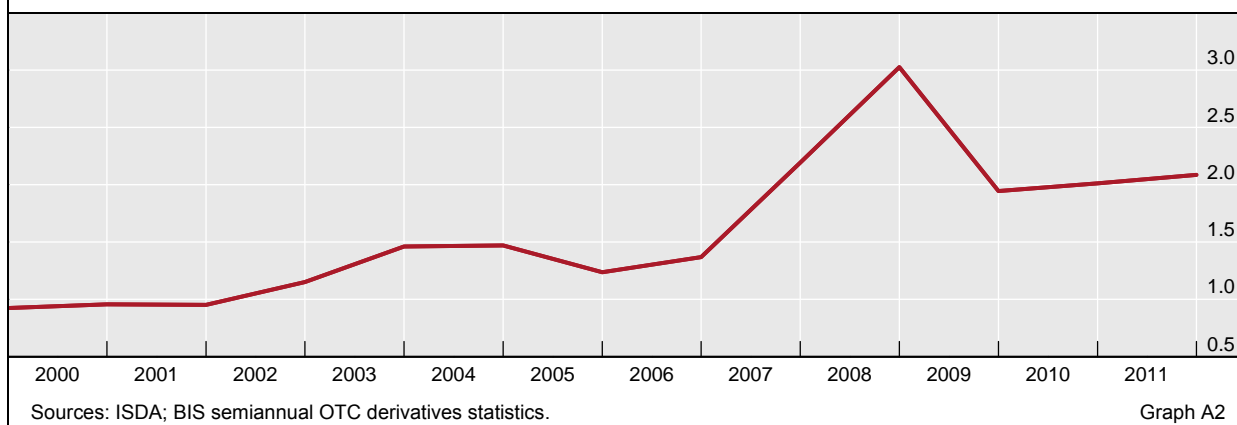
Uncovered credit exposures between counterparties to bilateral trades in the over-the-counter (OTC) derivatives market were at least \$2.1 trillion at end-2011 (Graph A2). While this is lower than the estimated \$3.0 trillion at the end of 2008, just after the peak of the financial crisis, the volume of uncovered positions appears to have increased in both 2010 and 2011.

We estimate the uncovered credit exposures by subtracting the volume of collateral posted in the OTC derivatives market from the counterparty credit exposures as indicated by the BIS Semiannual Survey. Counterparty credit exposures, in turn, refer to the sum of all positive market values of bilateral positions between market participants after netting offsetting trades covered by netting agreements. These “gross credit exposures” increased from \$3.5 trillion to \$3.9 trillion during 2011. They were \$5.0 trillion at the end of 2008.

Collateral posted against counterparty credit exposures was no more than \$1.8 trillion at end-2011, \$1.5 trillion at end-2010 and \$2.0 trillion at end-2008. We derive these estimates from the amount of “collateral in circulation” reported in the 2012 Margin Survey of the International Swaps and Derivatives Association (ISDA), which was \$3.6 trillion at the end of 2011. However, we adjust this figure to account for the fact that it counts each unit of outstanding collateral at least twice: it is the sum of collateral posted and received by market participants (see Appendix 2 of the ISDA survey), and it counts the same unit of collateral multiple times if counterparties post it against different credit exposures. The result of the multiple counting is an overstatement of the counterparty exposures effectively backed by collateral.

### Uncovered counterparty exposures in global OTC derivatives markets

In trillions of US dollars



Market values of foreign exchange derivatives also increased ...

In contrast, the outstanding volume of foreign exchange derivatives changed little, although their market value also increased notably. The gross market value increased by 9%, largely as a result of changes in the values of contracts between the G3 currencies, with the euro depreciating by 5% against the dollar and 8% against the yen in the second half of 2011. In a smaller segment of the market, the gross market value of contracts referencing the Swiss franc fell by 30%, reflecting the Swiss National Bank's decision to try to cap the value of the franc against the euro. This caused the franc to depreciate sharply to just below the cap, reversing a strong appreciation over the preceding several months. Hence, current and expected future values of the exchange rate probably moved back towards the fixed rates locked into many outstanding contracts, thus reducing their cost of replacement. The outstanding volume of foreign exchange contracts referencing the Swiss franc also fell

notably, by 16%, perhaps as some market participants who would have incurred losses if the franc appreciated against the euro decided to no longer hedge this risk.

In the smaller equity and commodity segments of the OTC derivatives market, outstanding notional amounts fell somewhat, while market values changed little. The outstanding volume of equity derivatives fell by 13%, reflecting similar proportionate declines in both options and forward and swap positions. The overall decline in commodity derivatives positions was 3%, again with similar proportionate reductions in options and forward and swap positions.

... but were little changed for equity and commodity derivatives

## Countercyclical policies in emerging markets<sup>1</sup>

*Emerging market economies (EMEs) have historically faced challenges in implementing countercyclical policies. However, the policy environment has changed. This paper finds evidence that EMEs were able to conduct countercyclical monetary and fiscal policies over the past decade. Indeed, the EMEs that have leaned more heavily against the business cycle have generally used both monetary and fiscal tools to do so.*

*Keywords: Countercyclical monetary and fiscal policies, Taylor rule, emerging markets.*

*JEL classification: E30, E43, E63.*

Can emerging market economies (EMEs) successfully pursue countercyclical monetary and fiscal policies? In the past, EMEs often found it difficult to do so. This was particularly the case for central banks. Monetary policy was frequently subordinated to the requirements of an expansionary fiscal policy, a condition described by Sargent and Wallace (1981) as fiscal dominance. And fiscal expansion during economic upturns left little scope for countercyclical policies during downturns. However, the era of fiscal dominance appears to have ended in most EMEs.

This study finds that many EMEs have implemented policies that are almost as countercyclical as those of many advanced economies, even if the individual outcomes have varied. Furthermore, the results indicate that the EMEs that leaned more heavily against the business cycle generally relied on both monetary and fiscal policy to do so.

That EMEs are able to pursue countercyclical monetary and fiscal policies is a welcome development. Such policies have certainly benefited EMEs, by reducing their output volatility, and may quite possibly have helped to stabilise the global economy. However, these findings should not be allowed to induce a sense of complacency. A policy that is countercyclical is not always sustainable, as recent experience in the euro area shows. It remains crucial to closely monitor fiscal sustainability and financial imbalances.

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<sup>1</sup> The analysis was first prepared for the Meeting of Emerging Market Deputy Governors (Basel, 16–17 February 2012). The author thanks meeting participants, Claudio Borio, Stephen Cecchetti, Andrew Filardo, Enisse Kharroubi, Zsolt Kuti, Madhusudan Mohanty, Philip Turner, and Christian Upper for useful comments and discussions. Emese Kuruc provided excellent research assistance. The views expressed are those of the author and do not necessarily reflect those of the BIS.

This special feature is organised as follows. The first section outlines how the countercyclicality of monetary and fiscal policies can be measured. The second introduces the empirical estimation strategy and the third presents the results. The fourth highlights some caveats and the final one concludes.

## Measuring countercyclicality

Monetary and fiscal policies can stabilise the business cycle by reining in economic activity during booms and bolstering it during downturns. For monetary policy, this means increasing the real policy rate during booms and lowering it in recessions; for fiscal policy, this means adjusting expenditures and taxes beyond the range that automatic stabilisers would achieve, with the aim of cutting government deficits during booms and increasing them in recessions.

One way to measure how far monetary policy is countercyclical is to estimate the correlation between the business cycle and the real policy interest rate, controlling for other relevant factors. The Taylor (1993) rule offers a straightforward way to do so. The policy rate is modelled as responding to several variables:

$$i = \pi + \alpha(y - y^*) + \beta(\pi - \pi^*) + r^* \quad (1)$$

where  $i$  is the nominal policy interest rate,  $\pi$  is the rate of inflation,  $\pi^*$  is the (explicit or implicit) inflation target,  $y - y^*$  is the output gap,  $r^*$  is the “equilibrium” real interest rate, and  $\alpha$  and  $\beta$  are parameters that represent the degree to which a central bank responds to output and inflation developments, respectively. The intuition behind the Taylor rule is straightforward: a monetary authority should adjust the policy rate one-for-one for changes in inflation ( $\pi$ ) and should respond positively to business cycle fluctuations ( $y - y^*$ ) and the deviation of inflation from the inflation target ( $\pi - \pi^*$ ). In particular, a larger  $\alpha$  captures a more countercyclical monetary policy, while a negative value would imply a procyclical monetary policy.<sup>2</sup>

For fiscal policy, Taylor (2000) provides an analogous approach. The fiscal balance, measured as a percentage of GDP, is split into structural and cyclical factors:

$$b = b^* - \gamma(y - y^*) \quad (2)$$

where  $b$  denotes the general government budget balance as a percentage of GDP,  $b^*$  the cyclically adjusted deficit,  $y - y^*$  the output gap, and  $\gamma$  the degree of sensitivity of budget balance to the output gap. The coefficient  $\gamma$  can be used to measure for the degree of countercyclicality; the larger  $\gamma$  becomes, the more countercyclical is fiscal policy. Similarly, as in the case of monetary policy, a negative  $\gamma$  would imply procyclical fiscal policies.

The Taylor rule captures the countercyclicality of monetary policy ...

... and a similar approach captures that of fiscal policy

<sup>2</sup> Furthermore, a larger  $\beta$  might also signal that monetary policy is more countercyclical in responding to output deviations to the extent that these output deviations also appear in the inflation rate (via, for instance, the relationships captured in the Phillips curve).

The estimation takes policy preferences for smoothing into account

## Estimation

The degree to which monetary and fiscal policies are countercyclical is estimated over the 2000–11 period for a subset of EMEs that have adopted inflation targeting. To better match the data in the EMEs under investigation, equation (1) is extended to include an exchange rate term to reflect EME concerns about exchange rates in monetary policy-setting. In addition, an autoregressive term is added representing the preference of policymakers for smoothing interest rates. The two modifications yield the following empirical specification:

$$i = \phi i_{-1} + (1 - \phi) [\pi^* + \alpha(y - y^*) + \beta(\pi - \pi^*) + \delta(e - e_{-1}) + r^*] + \varepsilon \quad (3)$$

where, in addition to the variables defined in equation (1), the subscript  $(-1)$  denotes one-quarter lagged variables,  $\phi$  is an autoregressive parameter reflecting the preference of a monetary authority to smooth policy rate adjustments over time,  $e$  is the bilateral nominal exchange rate vis-à-vis the US dollar,  $\delta$  is the parameter reflecting the monetary policy response to exchange rate movements, and  $\varepsilon$  is the error term. The time and country subscripts are omitted for ease of representation.<sup>3</sup> Notice that  $\alpha$  remains the parameter of interest, because it captures the long-run countercyclicity of monetary policy.

In an analogous way, equation (2) is also modified to incorporate policy preferences for smoothing:

$$b - b^* = \psi(b - b^*)_{-1} - (1 - \psi)\gamma(y - y^*) + \xi \quad (4)$$

where, in addition to the variables defined in equation (2),  $\psi$  represents the policy-smoothing preference for fiscal policy, and  $\xi$  is the error term. The time and country subscripts are again omitted for ease of representation.<sup>4</sup> As in equation (3),  $\gamma$  remains the parameter of our interest, because it captures the long-run countercyclicity of fiscal policy.

For each inflation-targeting EME, equations (3) and (4) are estimated jointly using the method of seemingly unrelated regression for the 2000–11 period. In order to provide some context, similar estimates – without the exchange rate term in equation (3) – are also obtained for advanced economies.<sup>5</sup> Table A1 in the Appendix shows the estimation details.

<sup>3</sup> Potential output ( $y^*$ ) is estimated on quarterly output data ( $y$ ) between Q1 1999 and IMF projections up to Q4 2013 using the Hodrick-Prescott filter.

<sup>4</sup> Quarterly budget balances are seasonally adjusted and, where not available, are extrapolated from yearly figures. The structural budget balance ( $b^*$ ) is estimated on quarterly budget balance data between Q1 1999 and IMF projections up to Q4 2013 using the Hodrick-Prescott filter on quarterly budget balances ( $b$ ). This proposed  $b^*$  is used because it is available for all countries allowing a consistent methodology. This choice does not seem to affect the results: using instead the OECD estimates, where available, does not materially affect the  $\gamma$  estimates.

<sup>5</sup> The exchange rate term is not used for advanced economies, because exchange rate concerns are less relevant for policymakers there. Importantly, this estimation choice does not materially affect the estimates of  $\alpha$  and thus the conclusions of this special feature.

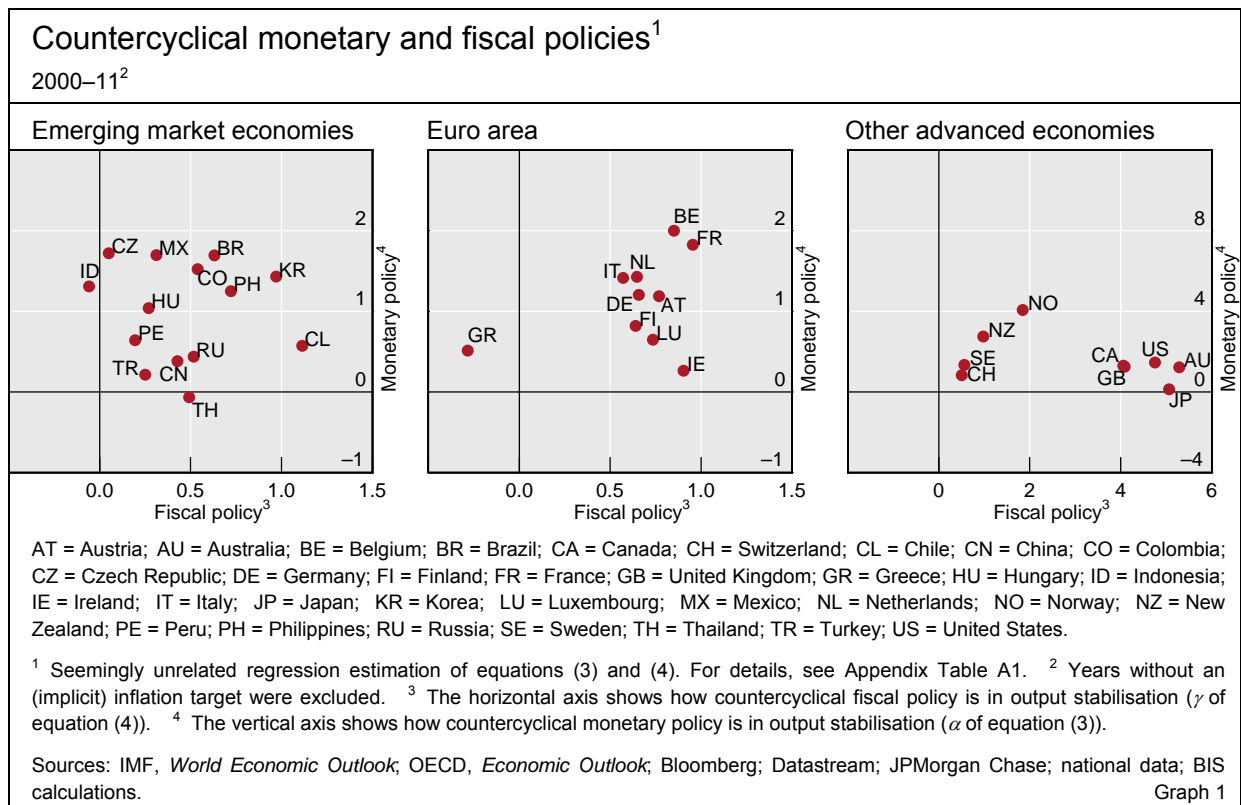
## Results

Graph 1 presents the point estimates of  $\alpha$  and  $\gamma$  and offers a cross-country perspective on the countercyclical characteristics of monetary and fiscal policies during the 2000–11 period. The vertical axis measures  $\alpha$ , the degree of countercyclicity for monetary policy, while the horizontal axis measures  $\gamma$ , the degree of countercyclicity for fiscal policy. Consequently, policies which fall into the first quadrant ( $\alpha > 0$ ,  $\gamma > 0$ ) are countercyclical and policies which fall into the third quadrant ( $\alpha < 0$ ,  $\gamma < 0$ ) are procyclical. Policies in the second ( $\alpha < 0$ ,  $\gamma > 0$ ) and fourth ( $\alpha > 0$ ,  $\gamma < 0$ ) quadrant are ambiguous, and their cyclicity depends on the relative strength of monetary and fiscal policies.

The results show that most EMEs were able to pursue countercyclical policies during the decade, as the dots representing individual economies are in the first quadrant or on its border. This impression is confirmed by statistical analysis. The last column in Table A1 in the Appendix shows the probability that both monetary and fiscal policies were countercyclical (ie  $\alpha > 0$  and  $\gamma > 0$ ). The probabilities are close to unity for around half of the EMEs in the sample, and are below half only in two cases. The evidence suggests that EMEs as a group were able to pursue countercyclical monetary and fiscal policies.

EMEs pursued countercyclical monetary and fiscal policies ...

Naturally, the policy mix varies considerably. While most EMEs used both monetary and fiscal policy to lean against the business cycle, some relied more heavily on one policy. For example, Thailand and Turkey relied heavily on fiscal policy while the Czech Republic and Indonesia looked more to monetary policy. The degree of countercyclicity also varied markedly from country to country. For instance, Chile pursued the most countercyclical fiscal policy among EMEs. This may reflect policy preferences for output stabilisation (as





laid down by Chile's fiscal responsibility law) and also the need to stabilise output in the face of volatile copper prices. Yet fiscal policy is not necessarily dictated by commodity prices: Russia pursued a less countercyclical fiscal policy despite its exposure to oil prices. It seems that policy preferences as well as economic and institutional frameworks have all shaped the policy mix adopted by EMEs over the past decade.

... as did euro area countries ...

To put the EME results into perspective, the centre and the right-hand panels show the results for advanced economies. The centre panel confirms that policies were also countercyclical in the euro area. Not only did the common monetary policy turn out to be countercyclical for all countries for which estimates were possible, but fiscal policy was also countercyclical in all countries except Greece. Interestingly, the estimates show that, on average, countercyclicity in the euro area was similar to that of the EMEs, although slightly stronger. Unfortunately, the further interpretation of the euro area results is not straightforward, as euro area countries are not independent in their monetary policy.

... and other advanced economies

Policies among other advanced economies were so much more countercyclical that the scales needed to be recalibrated in the right-hand panel. In particular, Japan and some English-speaking economies (Australia, Canada, the United Kingdom and the United States) stand out for their markedly countercyclical fiscal policies. For most of these countries, the phenomenon seems to be explained by the huge scale of the fiscal packages adopted after the Lehman failure. In any case, policy, especially fiscal policy, seems to be substantially more countercyclical in most of these economies than in EMEs.

In sum, both monetary and fiscal policy were countercyclical in most EMEs over the past decade. Although the estimates vary from country to country, the degree of countercyclicity compares with that in many advanced economies.

### Some caveats

As one EME can be very different from another, there are concerns whether the results can reflect the full complexity of policy-setting. For instance, the use of non-interest rate monetary policy measures (such as reserve requirements or quantitative measures) might have added noise to the estimates.

More concretely, there are concerns that the estimates might under- or overestimate countercyclicity. On the one hand, the reliance of these estimates on the 2000–11 average might have caused countercyclicity to be underestimated. Evidence from central banks suggests that policies became steadily more countercyclical in a number of EMEs over the past decade. Hence, past averages might show less countercyclicity than current policies.

On the other hand, very low advanced economy interest rates during the global financial crisis might have allowed EME central banks to cut their policy rates more sharply than they could have done otherwise. Thus, the estimates might overstate the degree to which EME monetary policy is countercyclical in the long run. Furthermore, while low advanced economy interest rates helped

countercyclical easing in the current downturn, their prolongation would complicate countercyclical monetary tightening in the future.

## Conclusion

Based on data from the past decade, this special feature finds that fiscal and monetary policies have been broadly countercyclical in EMEs that target inflation. Furthermore, the EMEs that leaned more heavily against the business cycle generally relied on both monetary and fiscal policy to do so. In fact, the degree of countercyclicality is only slightly below that seen in most euro area countries, suggesting that EME policy frameworks have matured substantially – although it must be noted that EMEs vary considerably in their policy preferences, economic issues and institutional frameworks.

These countercyclical policies lay the groundwork for EMEs to stabilise their output and thereby contribute to the stability of the global economy. This represents a major advance and a welcome departure from the era of fiscal dominance. That said, this is no time for complacency. Countercyclicality is a necessary but not a sufficient condition for sound macroeconomic policy. The example of some euro area countries – which pursued countercyclical policies over the past decade yet are nonetheless facing a crisis today – underlines the importance of continuously monitoring financial imbalances and the sustainability of fiscal policies.

Finally, there is ample space for future research on the countercyclicality of EME economic policies. For example, it would be useful to examine the effectiveness of non-interest rate measures in monetary policy and also to make an explicit assessment of sustainability in fiscal policy. This special feature hopes to pave the way for such research – and, more generally, for better understanding of economic policies in EMEs.

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## Appendix

<b>Estimates</b>						
Emerging economies	$\alpha$	$\gamma$	standard error ( $\alpha$ )	standard error ( $\gamma$ )	covariance ( $\alpha, \gamma$ )	probability ( $\gamma > 0, \alpha > 0$ )
Brazil	1.69	0.63	0.96	0.19	-0.01	0.96
Chile	0.57	1.11	0.20	0.20	0.01	1.00
Colombia	1.52	0.54	0.46	0.16	0.02	1.00
Mexico	1.70	0.31	1.00	0.04	0.00	0.95
Peru	0.64	0.20	0.40	0.32	0.03	0.70
Indonesia	1.31	-0.06	1.69	0.43	0.12	0.37
Korea	1.43	0.97	0.36	0.30	0.00	1.00
Philippines	1.25	0.72	1.37	0.43	0.13	0.79
Thailand	-0.06	0.49	0.12	0.31	0.00	0.28
Czech Republic	1.72	0.05	1.15	0.34	0.06	0.53
Hungary	1.04	0.27	1.21	0.77	0.07	0.52
Turkey	0.21	0.25	0.68	0.18	-0.01	0.57
China	0.38	0.43	0.11	0.22	0.00	0.97
Russia	0.44	0.52	0.28	0.29	0.01	0.91
Advanced economies	$\alpha$	$\gamma$	standard error ( $\alpha$ )	standard error ( $\gamma$ )	covariance ( $\alpha, \gamma$ )	probability ( $\gamma > 0, \alpha > 0$ )
Australia	1.22	5.29	0.24	1.44	0.12	1.00
Canada	1.30	4.06	0.35	0.54	0.05	1.00
United Kingdom	1.24	4.09	0.21	0.74	0.04	1.00
Norway	4.06	1.85	3.03	0.59	0.19	0.91
New Zealand	2.75	0.98	0.68	0.44	0.07	0.99
Sweden	1.34	0.56	0.52	0.16	0.00	1.00
Austria	1.19	0.77	0.25	0.19	0.01	1.00
Belgium	2.00	0.85	0.32	0.22	0.01	1.00
Germany	1.20	0.66	0.33	0.15	0.01	1.00
Finland	0.82	0.64	0.20	0.06	0.01	1.00
France	1.82	0.95	0.36	0.11	0.01	1.00
Greece	0.51	-0.28	0.37	0.33	0.03	0.18
Ireland	0.26	0.90	0.07	0.84	-0.01	0.86
Italy	1.41	0.57	0.38	0.10	0.01	1.00
Luxembourg	0.65	0.74	0.17	0.19	0.01	1.00
Netherlands	1.43	0.65	0.81	0.27	0.05	0.95
Switzerland	0.82	0.51	0.15	0.06	0.00	1.00
Japan	0.13	5.07	0.05	0.87	0.00	1.00
United States	1.46	4.75	0.50	0.50	0.07	1.00
<p>Seemingly unrelated regression estimation of equations (3) and (4) (without exchange rate adjustment for advanced economies). Estimates excluded where the null hypothesis that <math>\phi &lt; 1</math> or <math>\psi &lt; 1</math> could not be rejected. Years without (implicit) inflation target were excluded; for China, CPI inflation target set by the Central Economic Working Conference; for euro area countries, euro area inflation target; for the United States, 2%. Probability is calculated assuming normality of distribution.</p> <p>Sources: IMF, <i>World Economic Outlook</i>; OECD, <i>Economic Outlook</i>; Bloomberg; Datastream; JPMorgan Chase; national data; BIS calculations.</p>						



## Eurodollar banking and currency internationalisation<sup>1</sup>

*It is widely held that currencies of surplus countries, such as China, cannot enjoy wide international use. We argue that the eurodollar market has had little to do with the direction of net capital flows or the US current account balance. It has played different roles over the past 38 years, most of all intermediation among non-US residents. Looking at the eurodollar market could help predict the evolution of the offshore renminbi market. Even if it now mainly serves as a conduit of funds to mainland China from abroad, in the future this market, too, could mainly intermediate between non-Chinese residents.*

*JEL classification: E4, E5, F3, F4, G15.*

Wider international use of emerging market currencies, in particular the Chinese renminbi, has revived interest in the role of offshore markets (He and McCauley (2010), Maziad et al (2011), Frankel (2011) and BIS (2011)). In this special feature, we review the patterns of international flows of funds in the eurodollar market, focusing on the importance of residents and non-residents in offshore activity and the market's role as a conduit for capital flows.

Distinguishing gross flows from net flows, we find that most eurodollar flows do not finance the US current account (Borio and Disyatat (2011), Shin (2011)). This finding puts into doubt assertions that international use of the renminbi requires China to run a current account deficit. It also suggests that one-way speculative positioning, taken by some critics (Yu (2011)) as the main impetus for international use of the renminbi, will prove to be temporary.

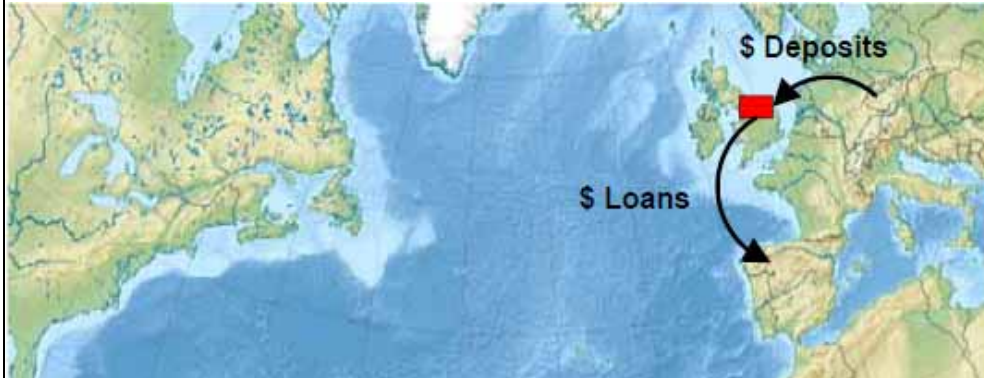
Rather, we expect that the offshore renminbi market will play the usual role of intermediating between non-residents, especially as non-Chinese become willing renminbi borrowers. As He and McCauley (2010) have argued, offshore markets perform essential economic functions, including separation of currency and country risks and the diversification of operational risks.

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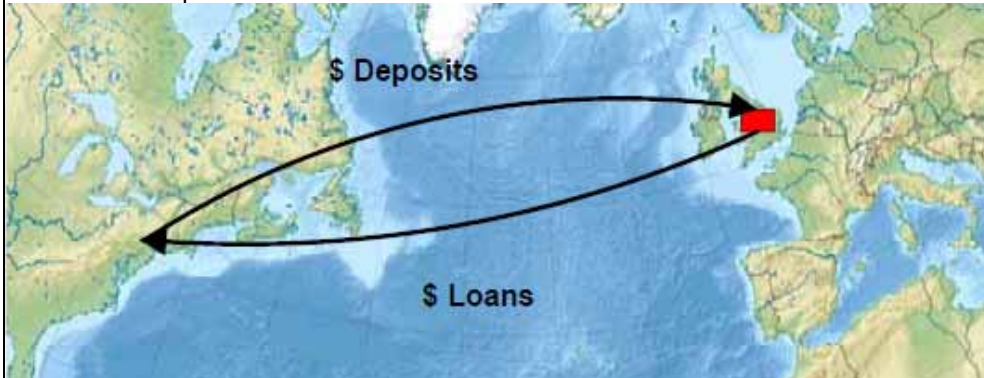
<sup>1</sup> The authors are from the Hong Kong Monetary Authority (HKMA) and the Bank for International Settlements (BIS), respectively. They thank Pablo Garcia-Luna and Karsten von Kleist for research assistance and Claudio Borio, Stephen Cecchetti, Patrick McGuire and Christian Upper for discussion. The views expressed are those of the authors and not necessarily those of the HKMA or the BIS.

## Eurodollar banking transactions

Pure offshore transactions



Pure round-trip transactions



International lending – outflow



International lending – inflow



Source: Authors' adaptation of Dufey and Giddy (1978, p 165; 1994, p 292).

Graph 1

From a residency perspective, offshore markets can feature four types of flows (Graph 1). In *pure offshore* markets, non-residents borrow from and lend to each other in the home currency (in the eurodollar market example in the graph, US dollars). In *round-trip* transactions, residents deposit home currency with banks offshore and residents borrow it back in a loop. Finally, the offshore market can be a conduit for *net flows* in domestic currency between the domestic economy and abroad.

With this typology in hand, we consult BIS data on the eurodollar market, covering 38 years.<sup>2</sup> We find that this market has played all of the roles just sketched, although their relative importance has shifted over time. Generally, the most common transaction involved a non-US borrower sourcing funds from a non-US lender, as in the pure offshore type. That said, the period from the latter 1990s to 2007 also featured a rise in round-tripping, with European banks borrowing dollars from US residents in order to fund claims on them, especially private asset-backed securities. Only to a limited extent has the eurodollar market served as a conduit of funds either from the United States to abroad (into the 1980s) or from abroad to the United States (more recently).

The rest of this feature is organised into four sections. First, we propose a typology of offshore markets in more detail. Second, we show how the eurodollar market has performed various functions over time. Third, we use our typology to analyse the balance sheet of the offshore renminbi market today and to discuss its likely evolution in the future. The final section concludes.

## Typology of the eurodollar banking market

Our typology of eurodollar market financing distinguishes between sources and uses of funds according to residence. In two types, the residence of sources and uses is identical, either both the United States or both offshore. In the other two types, the residence of sources and uses is different, making the offshore market a conduit for international lending inflows or outflows.

### *Pure offshore transactions*

The archetypal transaction in the offshore market of an internationalised currency is one denominated in that currency, that takes place between non-residents, outside the country of issue of the currency and subject to the law of another jurisdiction. Such a transaction, pictured in the top panel of Graph 1, need not register in the capital account or the current account of the currency's home country, although it typically clears and settles through banks in the country of issue.

Consider an example from the 1970s: a Middle East central bank deposits \$10 million in a bank in London, which in turn lends the funds to a Brazilian oil importer. The dollars might go through one or more offshore interbank

The eurodollar market intermediates between non-residents ...

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<sup>2</sup> Unfortunately, we miss the first 15–20 years of the eurodollar market (Schenk (1998)).

transactions that could take place in London or another banking centre, and the interbank counterparties could be arm's length or affiliated.<sup>3</sup>

Another example shows that pure offshore intermediation in the eurodollar market can also function as what Obstfeld and Taylor (2004) call an asset swap. This is a symmetrical exchange of claims that amount to a pair of offsetting *gross* flows but no net flow. A German resident and a French resident exchange dollar claims on each other. Here, they diversify their portfolios in the dimensions of credit (a claim on a foreign rather than domestic resident) and currency (a claim in dollars instead of French francs or Deutsche mark (or, more recently, euros)).<sup>4</sup>

It is important to recognise that ultimately pure offshore intermediation in dollars does not require either sourcing funds, or deploying funds, in the United States. In the example of London's intermediation of dollars between the Middle East oil producer and Brazilian oil importer, the story can be told of the Brazilian firm borrowing dollars in London to buy oil and the Middle East central bank ending up holding the deposit created by the drawdown of the loan. Or the story can be told in the other direction, as described above. Again, while the funds may flow through the US banking system, the residence of the placer of funds, the residence of the borrower of funds, the booking location of the deposit and the loan, and the jurisdiction governing the transaction are all outside the United States.

#### *Pure round-trip transactions*

A pure round-trip transaction is the opposite of a pure offshore transaction, ie both sides of the transactions are residents, not non-residents. In this type, pictured in the second panel of Graph 1, the offshore market serves as a balance sheet through which funds loop from the domestic economy back to it. (Historically, pure eurodollar round-tripping would be better portrayed as linking New York and Caribbean centres, with banks in New York controlling assets and liabilities in their Caribbean branches.)

... or between US residents ...

Pure round-trip transactions can be motivated by regulatory arbitrage (Aliber (1980, 2002)). If domestic deposits attract reserve requirements or incur deposit insurance premiums or pay yields that are capped by interest rate regulation, then depositors willing to hold a deposit in a Caribbean or London branch of a familiar bank can avoid such costs or regulations and receive a higher yield. In some ways, offshore round-tripping of funds responds to the same regulatory incentives as intermediation by non-bank financial institutions within an economy. Institutions such as finance companies, often dubbed "shadow banks", typically are similarly not subject to reserve requirements, deposit insurance or interest rate caps.

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<sup>3</sup> In the 1970s, Middle East oil exporters ran current account surpluses while Brazil ran current account deficits, so this transaction through the eurodollar market exemplifies what Obstfeld and Taylor (2004) dub development finance, involving *net* flows. From the standpoint of the US economy, however, there is no net borrowing or lending.

<sup>4</sup> Note that, in order to diversify credit, the French asset manager must deposit with a non-French bank, so different nationality rather than merely different residence is involved.



Round-tripping can also involve important credit intermediation in which a non-US bank puts its capital at risk. In the 2000s, as we shall see below, European banks attracted dollar funding from risk-averse US residents in order to finance holdings of ultimately risky US asset-backed securities at what seemed to be attractive spreads.

#### *Net international lending through offshore markets*

... and serves as a conduit for net international lending

Both types already considered are, from the standpoint of the United States and the rest of the world, gross flows. Dollars flow from non-residents to non-residents or from residents to residents. In the third and fourth types, the residence of the source and use of funds differs: one is a resident of the United States and the other a non-resident. In the outflow type (Graph 1, third panel), funds flow from US residents into the offshore market, where they are lent to non-residents. In the inflow type (Graph 1, bottom panel), funds flow from non-residents through the offshore market to US residents.<sup>5</sup> This is the realm of net capital flows. For example, we conjecture that offshore Australian dollar deposits placed by non-Australians ultimately fund claims on Australian households and firms.<sup>6</sup> We will see that such is not the case for the eurodollar market, where net international lending between the US and abroad, whether outflows or inflows, has rarely been important compared to gross flows.

### The eurodollar market experience

In this section, we interpret eurodollar banking in relation to these types. We first find that eurodollar banking is large, with intermediation offshore amounting to as much as a quarter or a third of global dollar intermediation. Second, we find that over the long run the eurodollar market has primarily performed pure offshore intermediation among non-residents. However, round-tripping grew to reach a rough balance with pure offshore intermediation by the mid-2000s. Finally, net lending/borrowing has generally remained modest, even as the US economy shifted from a net international creditor to a net international debtor position.

#### *The scale of eurodollar banking*

The eurodollar market is sizeable in relation to domestic US banking

The offshore component of US dollar banking is large, both absolutely and relative to its domestic counterpart. This can be seen in the memorandum items in the last row of Table 1. A quarter of the US dollar balance sheet is located outside the United States, the highest share for any of the currencies for which the BIS data provide a breakdown (McCauley (2010, p 63)).

The offshore share of dollar banking is not only large, but also, until the global financial crisis, it tended to grow in relation to the US banking system. By the fourth quarter of 1974, some 17 years after the birth of the eurodollar market, offshore dollar claims on, and liabilities to, non-banks had grown to 9%

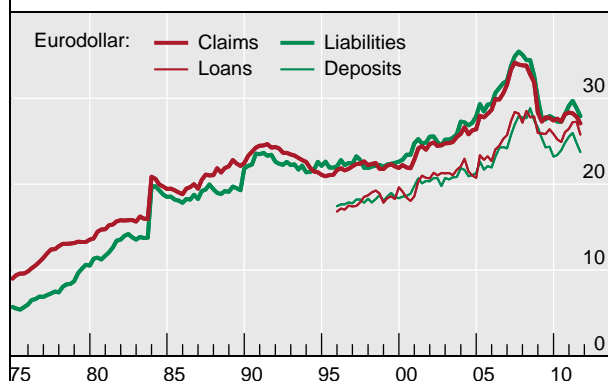
<sup>5</sup> Either corresponds to what Obstfeld and Taylor (2004) call development finance.

<sup>6</sup> See Australian Bureau of Statistics (2001, 2008) and McCauley (2010).

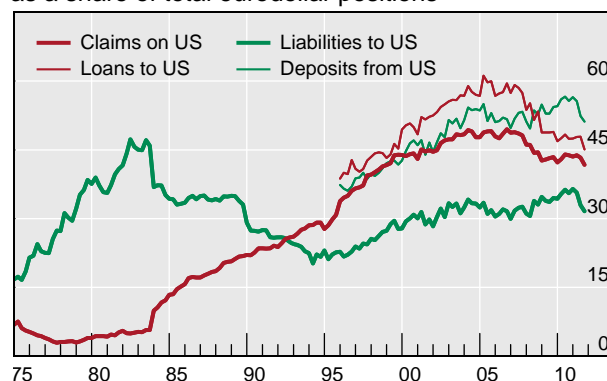
## Eurodollar banking: relative size and importance of US residents

In per cent

Eurodollar share of global dollar banking<sup>1</sup>



Positions against US non-bank residents as a share of total eurodollar positions



<sup>1</sup> Break in series in Q4 1983, when Caribbean centres joined the reporting area.

Sources: Federal Reserve Statistical Release Z.1 (flow of funds); BIS.

Graph 2

and 6% of global dollar claims and liabilities, respectively (Graph 2, left-hand panel). This understated the share of dollar banking outside the United States, since the data did not yet cover the Caribbean booking centres. Their inclusion in the BIS reporting area at the end of 1983 resulted in a jump in this percentage. Then, the proportion of offshore intermediation in global dollar intermediation levelled off in the 1990s after the Federal Reserve lowered reserve requirements on large-denomination domestic deposits to zero, in effect removing its tax on intermediation in the United States. But then, in the 2000s, the offshore proportion went up again despite the absence of reserve requirements and deposit insurance on deposits in the United States, to reach more than a third. The proportion of global dollar intermediation outside the United States has fallen since the global financial crisis. To anticipate our finding below, this rise and fall in the eurodollar market's share in overall dollar bank intermediation was associated with a rise and fall in round-tripping.

### *Pure offshore intermediation and round-tripping*

Most dollar offshore banking corresponded in mid-2010 to the pure offshore type. This can be seen in the assets of banks outside the United States in Table 1. As of mid-2010, total claims booked offshore were \$4.867 trillion, of which \$2.143 trillion were claims on US residents. Thus, some \$2.7 trillion out of the approximately \$4.9 trillion offshore claims sheet represented claims on residents of countries other than the United States. Moreover, pure offshore banking has been regaining importance since the onset of the global financial crisis.

To see the rise and fall of round-tripping, we plot four US shares of the offshore dollar balance sheet (Graph 2, right-hand panel). In this panel, pure offshore banking registers at zero and pure round-tripping at 100%. For instance, the above-mentioned \$2.1 trillion of claims on US non-banks in June 2010 represented 44% of total claims, as plotted by the thick red line for that date. Claims on US residents originally accounted for a single-digit percentage

Pure offshore intermediation is the norm for eurodollar banking ...

of overall offshore claims. It became evident that they were a bit higher when the Caribbean centres joined the reporting area in 1983. This percentage then rose to almost half before the outbreak of the crisis, and has fallen since. US residents accounted for an even larger share of loans, once these were separately identified in the mid-1990s, as shown by the thin red line.

On the liabilities side, the eurodollar market from early on drew considerably on deposits from US residents, with the percentage fluctuating between 20 and 40% as shown by the thick green line in Graph 2, right-hand panel. In the 1970s, dollar interest rates offshore were considerably higher than onshore, since onshore deposits attracted reserve requirements, incurred deposit insurance premiums, and were also subject to an interest rate cap under Regulation Q. As a result, investment in a London or Caribbean dollar deposit produced incremental interest income (Kreicher (1982)). High money market yields in 1979–82 increased the effective cost of reserve requirements and led to rapid growth in placements in the eurodollar market, as money market funds competed for yield by investing more offshore. Some of the subsequent decline in the share of funding from US residents may be an artefact of banks relying more on dollar bonds for funding, given that the residence of holders of their bonds cannot usually be identified. When deposits

Consolidated global US dollar bank balance sheet, June 2010			
In billions of US dollars			
Banks in the United States vis-à-vis non-banks			
Assets		Liabilities	
Cash and reserves at the Fed	956	Cash	.
Loans	6,837	Deposits	8,274
Of which: to rest of world	101	Of which: from rest of world (including currency)	590
Securities	2,576	Credit market instruments	1,923
Miscellaneous assets	4,117	Miscellaneous liabilities and tax payable	2,549
<b>Total onshore</b>	<b>14,487</b>	<b>Total onshore</b>	<b>12,747</b>
Banks outside the United States vis-à-vis non-banks			
Assets		Liabilities	
Loans	2,246	Deposits	2,588
Of which: to US residents	1,086	Of which: from US residents	1,465
Other claims	2,621	Other liabilities	1,519
<b>Total claims offshore</b>	<b>4,867</b>	<b>Total liabilities offshore</b>	<b>4,108</b>
Of which: on US residents	2,143	Of which: to US residents	1,491
<b>Grand total onshore + offshore</b>	<b>19,354</b>	<b>Grand total onshore + offshore</b>	<b>16,855</b>
<i>Memo: outside US as % of grand total</i>	25.1	<i>Memo: outside US as % of grand total</i>	24.4
<p>The US data consolidate US-chartered banks, foreign branches of foreign-chartered banks and bank holding companies. For the US data, loans include bank loans, mortgages, consumer credit, security credit and customers' liability on acceptances; securities equal total bank credit less loans; miscellaneous assets exclude investment in bank subsidiaries of bank holding companies; deposits include all deposits and federal funds and security repos; securities include open market paper, corporate bonds and other loans and advances; miscellaneous liabilities exclude investment by bank holding companies in US-chartered banks. In general, assets can exceed liabilities owing to equity and owing to the use of foreign exchange swaps to produce dollar funding.</p> <p>Sources: Authors' compilation based on Federal Reserve Statistical Release Z.1 (flow of funds), Tables L.107 and L.110–112; BIS international banking statistics.</p>			

Table 1

were separately identified in the mid-1990s, as shown in the thin green line in Graph 2, right-hand panel, the proportion of US residents among eurodollar depositors, at around 40%, resembled the level and the shape of the share of US residents among borrowers in the loan market.

Stepping back, it is evident that over time the eurodollar market shifted from pure offshore to a rough balance between intermediation for the rest of the world and for US residents. At first blush, this is strange: by the 2000s the original regulatory incentives for round-tripping – namely, Fed reserve requirements on large-denomination certificates of deposit and FDIC insurance assessments on domestic but not offshore deposits – had disappeared.

... but round-tripping gained importance until 2007 ...

The rise in round-tripping has been interpreted as a result of regulatory arbitrage. In their ill-fated dollar intermediation, European banks borrowed dollars from US money market funds, among others (McGuire and von Peter (2009), Baba et al (2009)), and invested in private asset-backed securities (Bernanke et al (2011), Bertaut et al (2012)). While US and Canadian banks were subject to minimum capital/asset ratios as well as capital/risk-weighted asset ratios, European banks, like US securities firms, were not.<sup>7</sup> Thus, European banks could gear up their equity by 30 or 40 times, investing in assets with low risk weights, including well rated private mortgage-backed securities. Of course, European banks could use affiliates in the United States to borrow dollars and to invest in such securities; but many used affiliates outside the United States, thereby contributing to round-tripping. As European banks continue to deleverage their dollar balance sheets after the crisis, one can expect round-tripping in the eurodollar market to continue to subside.

... owing to regulatory arbitrage

### *Net international lending*

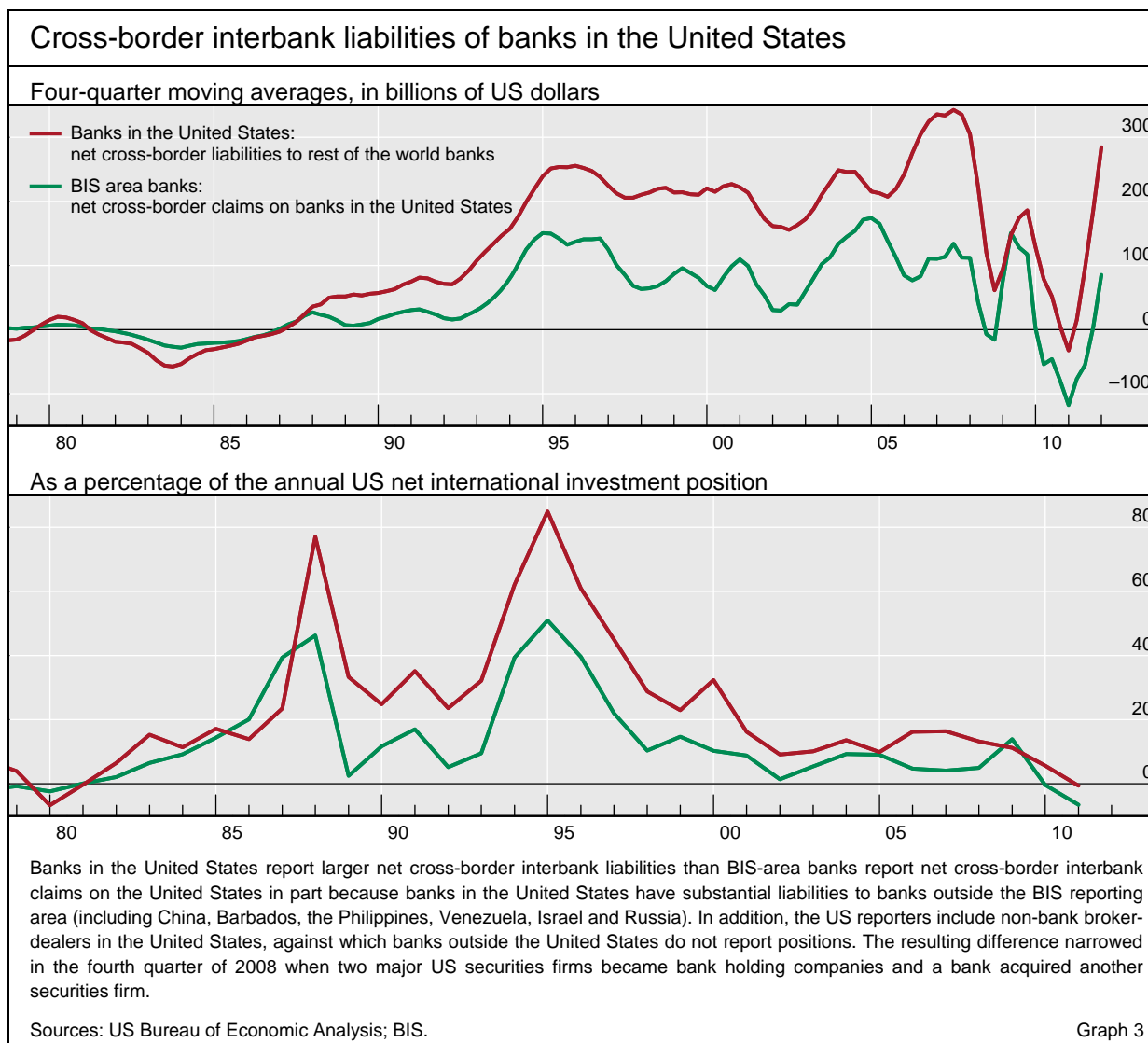
The eurodollar market served as conduit for net flows of funds between the United States and the rest of the world only to a limited extent. Given the importance of the banking system as a conduit for capital flows, one might expect on macroeconomic grounds that, as the US net international investment position went from positive to negative with the chronic current account deficits of the 1980s, banks in the United States might have shifted from supplying dollars to banks offshore to drawing in dollars from them.<sup>8</sup> Qualitatively, this expectation was realised; but quantitatively, not much or for long. To be sure, the net claim of banks in the United States turned into a consistent net liability on cue when the US net international investment position turned negative in

Net international lending generally remained relatively small

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<sup>7</sup> This will change with the implementation of Basel III, which includes a new unweighted leverage ratio. The limitations in Basel II that became evident were addressed by the Basel Committee on Banking Supervision (2009; 2010, pp 5–6) revisions of the capital requirements for the trading book as well as the new unweighted leverage ratio. See also the discussion in Bernanke et al (2011) and UBS (2008).

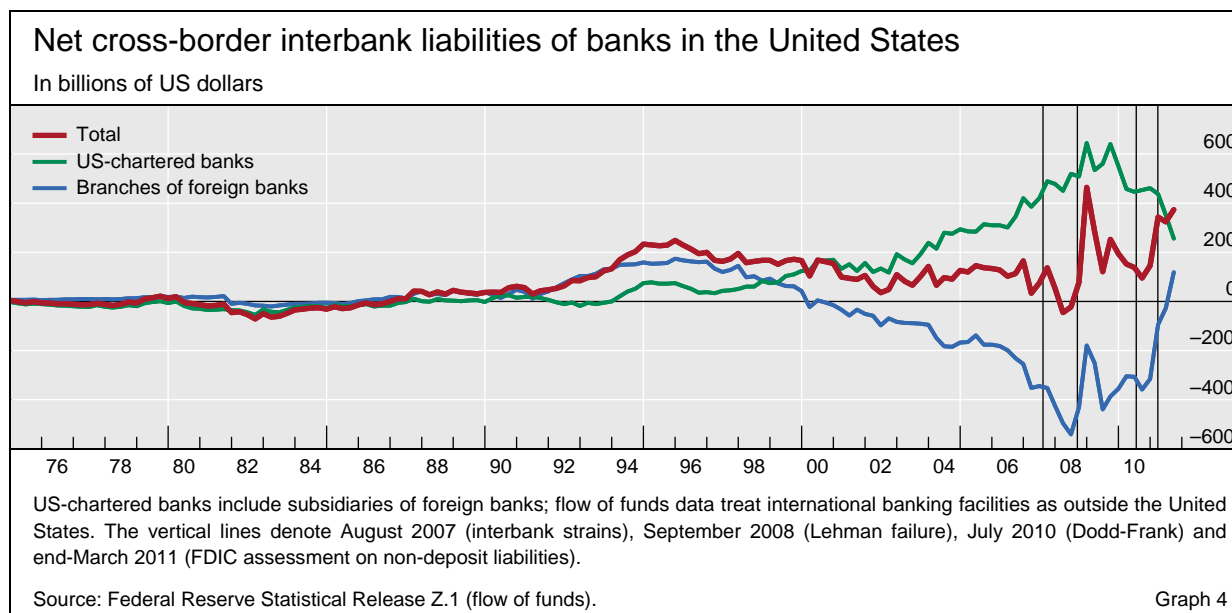
<sup>8</sup> In Table 1, claims on US non-bank residents of banks outside the United States (\$2.143 trillion) exceed liabilities to them (\$1.491 trillion), suggesting a possible net inflow, quite apart from the interbank flow. However, on the liabilities side, banks outside the United States generally cannot identify the residence of their bondholders. However, US Treasury et al (2011, p 23) report \$0.7 trillion holdings by US residents of long-term bonds issued by foreign firms in the financial industry. Taking most of this to be bank bonds, it is not clear that there is any net dollar lending by banks outside the United States to US non-banks.



1986 (Graph 3, top panel). However, this net claim accounted for a substantial fraction of the US net debt only into the mid-1990s (Graph 3, bottom panel). If one juxtaposes the scale of the top panel in Graph 3 – *hundreds of billions of dollars* – with the *trillions of dollars* in Table 1, it is evident that net interbank flows remained small in relation to the overall size of the eurodollar market.

Thus, while the interbank channel shunted dollars from the United States to the rest of the world when the United States was a net creditor and has on balance brought in dollars since the United States became a net debtor, the channel was never very large. On this showing, the eurodollar market has struck a shifting balance between *gross* flows (strictly offshore intermediation and round-tripping) more than serving as a conduit for *net* international lending.

Net bank flows between the rest of the world and the United States remained small because they were subject to strong cross-currents (Shin (2011)). In the 2000s, while US-owned banks were drawing on their foreign affiliates in order to fund their US operations (Graph 4, green line),



foreign-owned banks borrowed in the United States and forwarded the proceeds to their offices abroad (Graph 4, blue line).<sup>9</sup>

In summary, the eurodollar banking market has played various roles in international finance over time. Most characteristically, it has served as an intermediary between non-US placers of dollars and non-US borrowers of dollars. The element of round-tripping between US depositors and US borrowers grew over time and peaked at close to half the market in 2007. Net interbank flows have remained modest, even as the US economy shifted from a net international asset position to a net international liability position. The eurodollar market has intermediated funds mainly between borrowers and lenders outside the United States and to a lesser extent between borrowers and lenders within the United States, but hardly at all between borrowers in the United States and lenders abroad. This experience provides useful perspective on the current role of the offshore renminbi market.

### Lessons for renminbi offshore banking

At present, the renminbi balance sheet of banks in Hong Kong SAR serves as a conduit for net renminbi lending from the rest of the world to the mainland. Through it, non-residents stake renminbi claims on mainland China. Deposits in renminbi by residents of Hong Kong and the rest of the world outside the mainland comprise the main source of funds. On the uses side, banks have claims on entities on the mainland, including the central bank, and some interbank claims and investments in government and corporate bonds.

Renminbi bonds issued by non-banks and held outside the banking system, which are not captured in Table 2, tend also to result in a net renminbi claim of the rest of the world on China. The government, government agencies,

<sup>9</sup> Recently, these positions have fallen in absolute value under the combined influence of Dodd-Frank's change in the assessment base for FDIC insurance and the Federal Reserve's second round of US Treasury purchases (Kreicher et al (2012)).

banks and firms resident on the mainland probably account for the majority of the ultimate renminbi obligations associated with \$40 billion equivalent of renminbi bonds issued by others than banks resident in Hong Kong.<sup>10</sup>

Pure offshore intermediation is a minority of offshore renminbi market activity...

As things stand, pure offshore intermediation in the renminbi offshore market accounts for a minority of activity there. At the end of 2011, loans and advances in renminbi booked by banks in Hong Kong were only CNY 31 billion, about 3% of total assets, and in addition a good part of the CNY 222 billion in negotiable debt instruments comprised trade claims on non-banks resident outside the mainland. Their sum, which can be taken as the upper limit of pure offshore intermediation, remains well below the CNY 588 billion in deposits (Table 2).<sup>11</sup> If the renminbi offshore market were to follow the eurodollar market, this pure offshore intermediation would rise. Indeed, loans and advances in renminbi booked by Hong Kong banks grew rapidly in the first quarter of 2012.

For its part, pure round-tripping accounts for little, if any, activity in the renminbi offshore market. As the offshore yields on renminbi deposits and bonds have been significantly lower than onshore, there is little incentive for mainland residents to invest in offshore renminbi assets. Rather, their interest lies in issuing renminbi liabilities offshore.

... reflecting current policy

This structure of bank balance sheets and bond issuance and holdings, however, reflects factors that are likely to prove temporary. In particular, the mainland Chinese authorities have only started to open the domestic capital market to participation by non-residents, and have retained significant

Renminbi balance sheet of banks in Hong Kong SAR, end-2011			
In billions of renminbi			
Assets		Liabilities	
Due from banks	665.4	Deposits	588.5
Of which: due from overseas banks	121.7	Personal	174.0
Loans and advances	31.0	Corporate	414.5
Negotiable debt instruments	222.3	Negotiable debt instruments	78.5
Other assets	62.6	Due to banks	184.2
		Of which: due to overseas banks	116.4
		Other liabilities	130.4
<b>Total</b>	<b>981.6</b>	<b>Total</b>	<b>981.6</b>
<b>Memo: US dollar equivalent</b>	<b>151.8</b>		
<p>"Overseas banks" means banks from areas outside Hong Kong SAR and mainland China. Other assets/other liabilities include items such as amount receivable/payable under reverse repos/repos, unrealised mark-to-market gains/loss of derivatives and the amount to balance a single currency balance sheet, which is a subset of the balance sheet of all currencies. The end-2011 renminbi/dollar rate was 6.463, according to the Federal Reserve G.5A release.</p> <p>Source: Hong Kong Monetary Authority.</p>			

Table 2

<sup>10</sup> According to BIS international securities data, three quarters of renminbi offshore bonds are sold by issuers of Chinese nationality, including issuers incorporated outside China but with beneficial ownership by Chinese entities.

<sup>11</sup> Note that offshore renminbi deposits are still tiny compared to onshore deposits. Onshore deposits amounted to CNY 78 trillion at the end of 2011. In other words, offshore renminbi deposits were less than 1% of onshore deposits.

restrictions on capital flows, particularly on outflows (McCauley (2011)). Expectations of a sharp renminbi appreciation have also dampened the willingness of non-residents to borrow in renminbi.

Looking forward, the offshore renminbi market could evolve to play different roles. Capital flows can be expected to become two-way and more balanced with capital account liberalisation (He et al (2012)).<sup>12</sup> The expected path of the renminbi exchange rate shows much less consistent appreciation, even as the Chinese current account surplus has narrowed. Thus, non-resident borrowing in the renminbi looks to be less discouraged by one-way expectations on the exchange rate.<sup>13</sup> In this case, the renminbi offshore market in Hong Kong (and in other financial centres) can be expected to evolve along the paths of the other types of offshore markets.

## Conclusions

The eurodollar market has played different roles over the last 38 years. Originally, although US residents held net dollar claims on the rest of the world through it and round-tripped dollar funds through it, it mostly intermediated between non-US residents. The eurodollar market reached its maximum size relative to domestic US intermediation before the recent global financial crisis on the strength of round-tripping, as European banks sold US investors low-risk placements and bought risky US debts. As European banks deleverage, this round-tripping is shrinking as a share of eurodollar banking, restoring intermediation between non-US residents as the increasingly characteristic eurodollar banking transaction.

An inference is that the current role of the offshore renminbi market as a conduit of funds from the rest of the world to the mainland may not be its last role. Over time, the renminbi offshore market is likely to play above all the role of intermediary between non-mainland borrowers and lenders.

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<sup>12</sup> High levels of required reserves on deposits in mainland banks could with more openness encourage round-tripping, but the central bank's practice of remunerating required reserves would limit the incentive to round-trip. See Ma et al (2011)).

<sup>13</sup> Cheung et al (2011) argue that a payoff to China from renminbi internationalisation would come from non-residents borrowing renminbi and thereby sharing China's short renminbi, long foreign currency position and its associated risk.



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## The expansion of central bank balance sheets in emerging Asia: what are the risks?<sup>1</sup>

*Central bank balance sheets in emerging Asia expanded rapidly over the past decade because of the unprecedented rise in foreign reserve assets. The corresponding expansion of the central banks' liabilities has created dangers – risks of inflation and financial instability and financial market distortions – that require attention.*

*JEL classification: E58, E61.*

What risks arise from the rapid expansion of central bank balance sheets in emerging Asia? This question has been attracting great interest in recent years because of the past decade's rapid increase of balance sheets to record levels. Most of the balance sheet growth has been in foreign exchange reserve assets, which to some extent reflects efforts to bolster such reserves in the aftermath of the late 1990s Asian financial crisis. Increasingly, however, the foreign reserve accumulation has been the by-product of resistance to appreciation of the domestic currency. Central banks have funded this asset accumulation in a variety of ways, including the extensive use of required reserves and remunerated excess reserves and the issuance of central bank paper.

This special feature explores whether the expansion of central bank balance sheets may contribute to risks of inflation and financial instability and to financial market distortions. The first section highlights the salient trends in central bank assets and liabilities in emerging Asia. The second discusses some of the policy risks that the expansion of central bank balance sheets may pose for the region. The third considers the policy challenges ahead.

### The expansion of central bank balance sheets in emerging Asia

The size of central bank balance sheets in emerging Asia has reached historically high levels over the past decade (Graph 1). For the nine Asian

Central bank  
balance sheets  
have grown rapidly

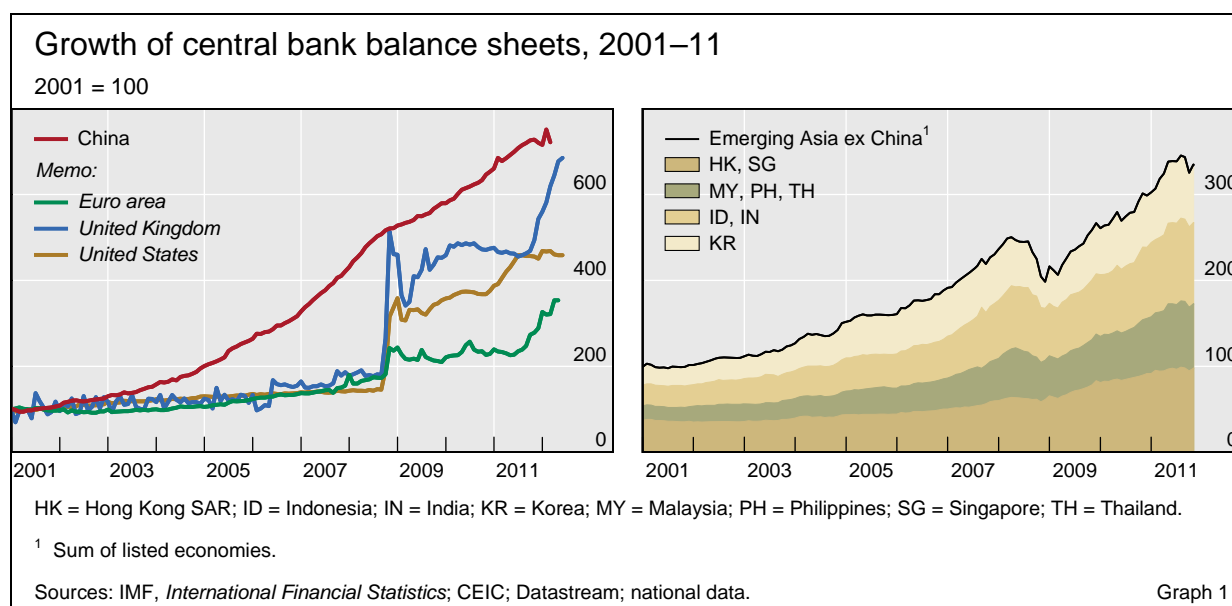
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<sup>1</sup> This article draws heavily on the presentations at the Bank of Thailand-BIS Research Conference entitled "Central bank balance sheets in Asia and the Pacific: the policy challenges ahead", held in Chiang Mai, Thailand, on 12–13 December 2011 (see [www.bis.org/events/cbbsap.htm](http://www.bis.org/events/cbbsap.htm) and *BIS Papers*, no 66 (2012)). The views expressed in this article are those of the authors and do not necessarily reflect those of the BIS. We are grateful to Claudio Borio, Stephen Cecchetti, Dietrich Domanski, Robert McCauley, Philip Turner and Christian Upper for comments and to Lillie Lam for research assistance.

emerging economies in Graph 1, the combined size of the balance sheets increased from USD 1.1 trillion in 2001 to 6.4 trillion in 2011. China has clearly contributed to this trend, but the upward trajectory has been widespread across the region. In both Hong Kong SAR and Singapore, for example, the central bank balance sheet is now close to 100% of GDP; in China, Malaysia and Thailand, it is around 50%; and for the region as a whole, it is about 35% (Graph 2). Further, the ratios as a share of GDP in emerging Asia generally exceed those in advanced economies even after the substantial expansion in the latter following the recent crisis.<sup>2</sup>

To better understand the causes and implications of the balance sheet expansion, it is useful to consider the general asset and liability structure of a central bank (Table 1): assets consist of domestic and foreign assets, and liabilities comprise currency in circulation, bank reserves, central bank securities, government deposits, other non-monetary liabilities, and equity capital. Equity capital represents accumulated profits as well as paid-in capital. Policies that increase the size of central bank assets entail corresponding increases in liabilities – which can have important implications for the financial system.<sup>3</sup>

In recent years, central banks in emerging market economies, particularly in Asia, have used their balance sheets in a distinctly different way from those in advanced economies. In many advanced economies, central banks have purchased domestic assets to ease monetary conditions, and the increase in



<sup>2</sup> We should be careful not to over-interpret differences in the size of central bank balance sheets as a percentage of GDP. Central bank balance sheets reflect in many ways the structure of particular financial systems, a characteristic that varies widely across the economies in Graph 1. For example, Hong Kong SAR and Singapore are highly open international financial centres, and the advanced economies are generally larger and have higher degrees of financial development and currency internationalisation than the emerging economies.

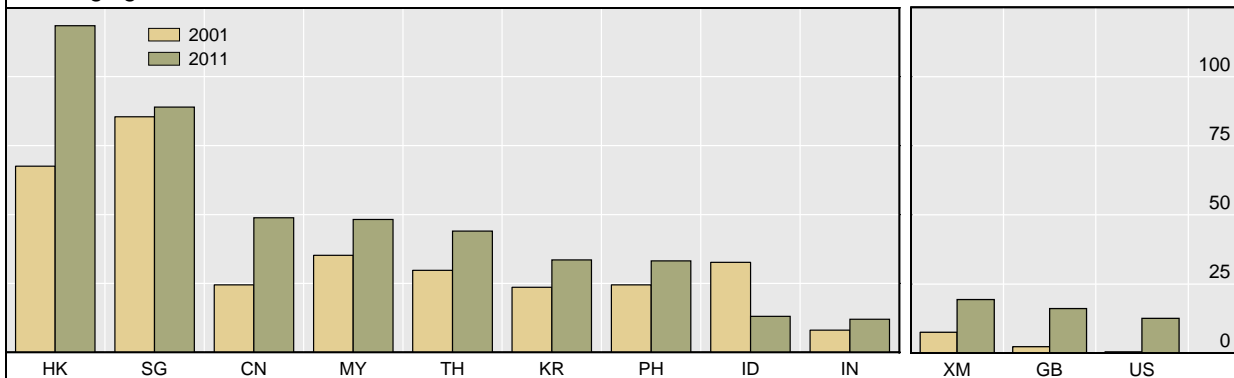
<sup>3</sup> Mohanty and Turner (2006) argue that even if the large-scale expansion of central bank foreign exchange assets did not create near-term financial risks, it could aggravate financial system risks and make financial intermediation less efficient.

## GDP share of central bank assets, 2001 and 2011<sup>1</sup>

In per cent

Emerging Asia

*Memo: advanced economies*



CN = China; GB = United Kingdom; HK = Hong Kong SAR; ID = Indonesia; IN = India; KR = Korea; MY = Malaysia; PH = Philippines; SG = Singapore; TH = Thailand; US = United States; XM = euro area.

<sup>1</sup> Total assets net of currency in circulation.

Sources: IMF, *International Financial Statistics*; CEIC; Datastream; national data.

Graph 2

central bank assets has been accompanied by a corresponding increase in central bank liabilities, mainly in the form of bank reserves. In contrast, central banks in the Asian emerging market economies have intervened heavily in foreign exchange markets and accumulated foreign reserve assets. The financing of this accumulation (as seen on the liabilities side of the central bank balance sheet) has been achieved via the expansion of monetary liabilities (eg increasing bank reserves) and of non-monetary liabilities (eg greater issuance of central bank securities).

The ability of central banks to significantly alter the size of their balance sheets reflects their special public policy role and the powerful flexibility they have to use both their assets and liabilities to achieve policy goals. Traditionally, central banks have used the power of their balance sheets to act as lenders of last resort. The evolving roles of central banks have led them to make additional use of the balance sheet, not least to more actively pursue price and financial stability (Bernanke (2012)). However, the use of central bank balance sheets to effect change can also create unintended risks, as we will explore.

A central bank balance sheet	
Assets	Liabilities
Foreign assets	Monetary liabilities
Domestic assets	Currency in circulation
	Bank reserves
	Non-monetary liabilities
	Central bank securities
	Government deposits
	Other liabilities
	Equity capital

Table 1

The remainder of this section further examines recent changes in central bank balance sheets in emerging Asia.

### Assets

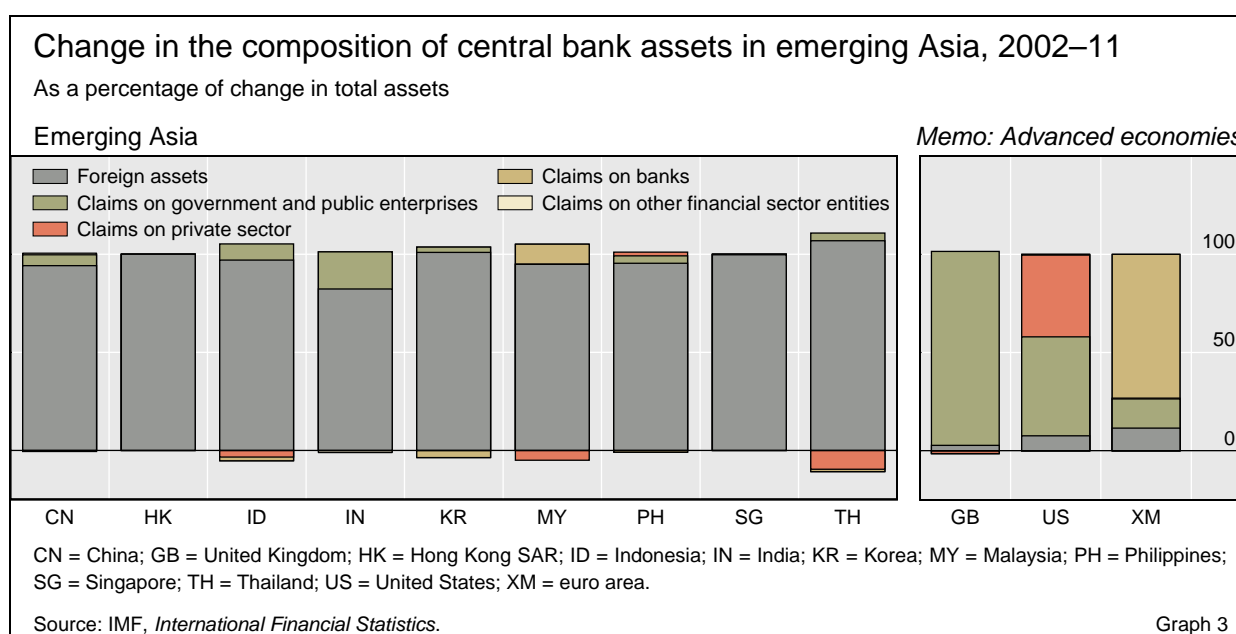
The remarkable increase in emerging Asia central bank assets has been dominated by the growth in foreign exchange reserve assets (Graph 3), mostly denominated in US dollars.<sup>4</sup> But the main policy factors driving the growth of foreign exchange assets have changed over time.

Accumulation of foreign exchange reserves accounts for the bulk of the asset expansion

In the aftermath of the 1997–98 Asian financial crisis, policymakers took to heart the importance of having large foreign exchange reserves that could be used in the event of a run on their currencies. By helping to reassure markets that the exchange rate regime was sound and resilient, the reserve buffers lowered the likelihood of a run. And ample reserves remain a key factor determining an economy’s credit rating and thus its borrowing costs. By the second half of the 2000s, central banks in the region boosted reserves to a level that generally exceeded conventional import and external debt metrics of reserve adequacy.

Since the mid-2000s, the accumulation of foreign exchange reserve assets has been primarily a by-product of a policy that has resisted the currency appreciation pressures generated by trade and capital flows in the region. Central banks have tended to intervene in currency spot markets, buying foreign assets (predominantly US dollar-denominated) to ease the pressures.

In this regard as well, economic history in the region weighed on the minds of policymakers. One of the central lessons of the Asian financial crisis was that fixed exchange rates are hard to defend in the face of large and volatile capital flows and substantial changes in sentiment. Authorities also understood from



<sup>4</sup> In contrast, the expansion of central bank balance sheets in the major advanced economies has largely consisted of the expansion of domestic currency assets, as Graph 3 indicates. See Table A1 in the Appendix for more detail.

historical experience that fully flexible exchange rate regimes can destabilise emerging economies. Against this backdrop, policymakers generally chose a middle ground of flexible but managed exchange rates. Although there were phases of heavy intervention to resist sharp depreciations, the more typical mode has been “leaning against the wind” in the face of appreciation pressure.

In theory, central banks could have accumulated foreign reserve assets by drawing down the domestic assets on their balance sheets and thereby limiting overall balance sheet growth. Indeed, in the years preceding the past decade, the large stock of government bonds on central bank balance sheets made selling government bonds a feasible option. Over the past decade, however, holdings of government bonds shrank relative to the growing size of foreign exchange reserve assets, causing central banks to increasingly finance asset accumulation via the expansion of liabilities.

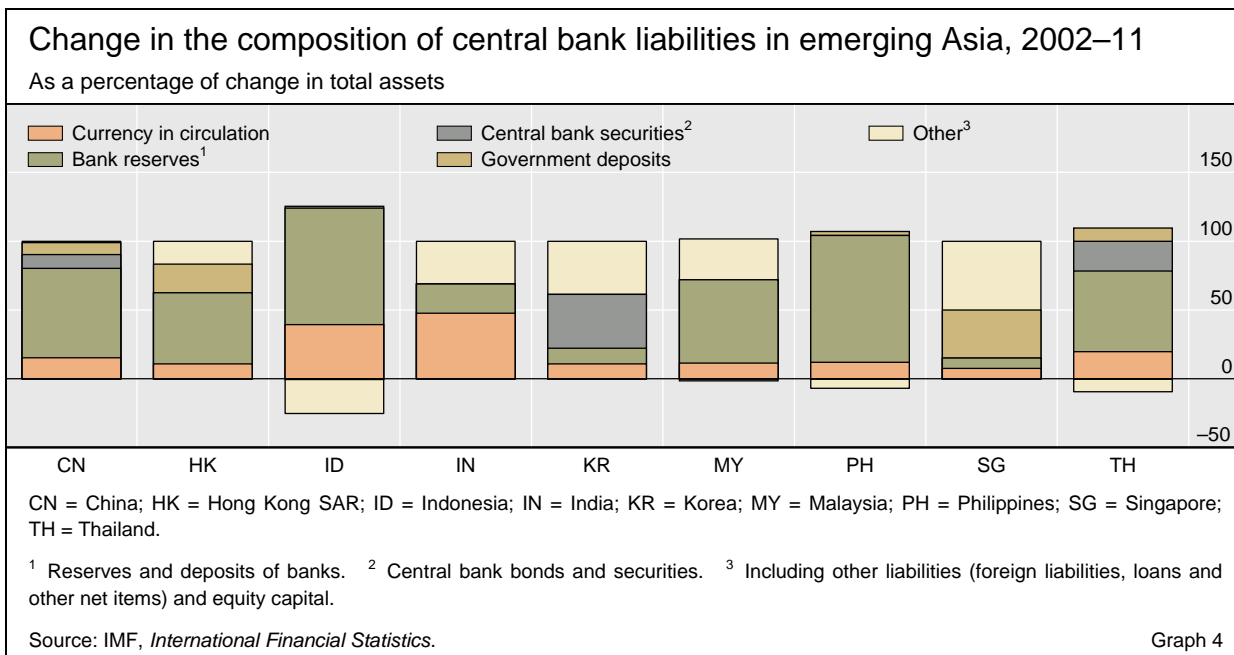
### Liabilities

On the liabilities side, the composition of the expansion has been more varied

While the growth rate of the region’s central bank liabilities has mirrored that of its assets, the composition of the liabilities side has become relatively more diverse (Graph 4).<sup>5</sup>

Currency and bank reserves have risen sharply across most of emerging Asia. In part, this growth is due to financial deepening and strong underlying economic growth in the region. In addition, in several economies where strong credit growth and frothy asset prices have been an issue, central banks have imposed higher reserve requirements to curb the growth of bank lending.

Changes in government deposits have also been an important factor in some economies. These changes reflect both the role of the central bank as the

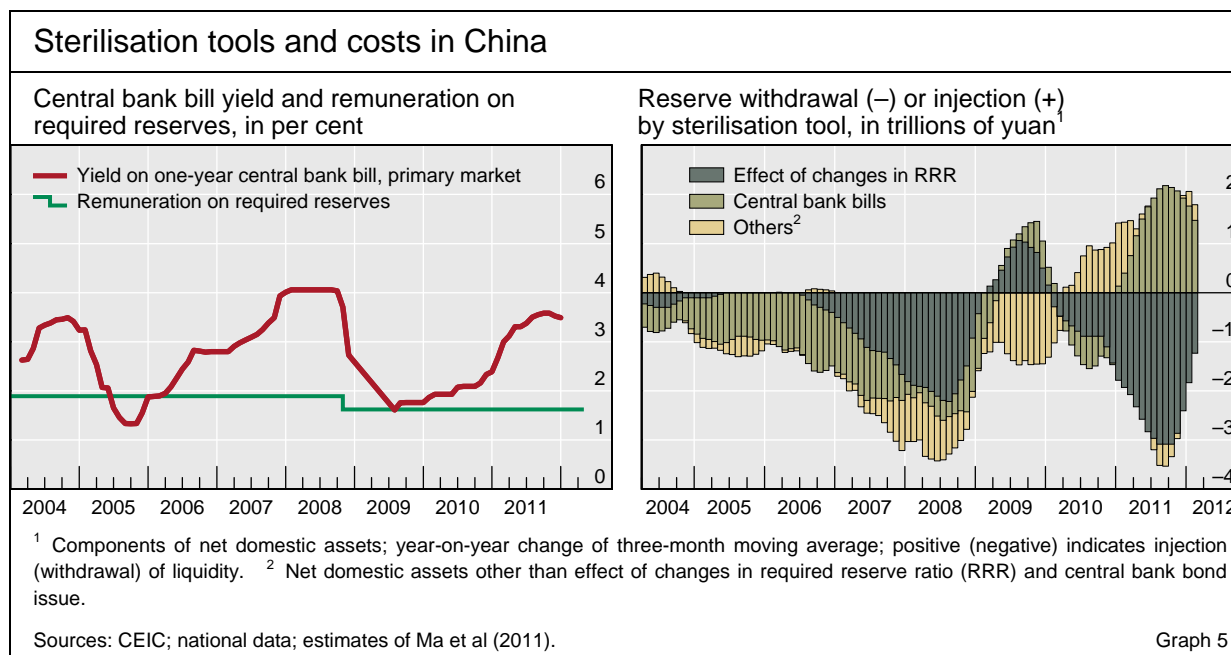


<sup>5</sup> See Table A2 in the Appendix for more detail. BIS (2005) provides several country analyses of changes in central bank balance sheets in the emerging markets in the wake of foreign exchange intervention.

government's banker and its active use of government deposits as a means to sterilise foreign exchange intervention. The issuance of central bank paper and the use of remunerated excess reserves or deposit facilities, such as the special deposit accounts at Bangko Sentral ng Pilipinas, have also played an important role.<sup>6</sup>

The diversity in the structure of central bank liabilities reflects both the historical use of particular tools in a given jurisdiction and their relative cost (BIS (2005)). For example, two commonly used instruments are required reserve ratios and the issuance of sterilisation securities. These tools have different costs and benefits. Compared with issuing central bank securities, increasing reserve requirements tends to remove reserves from the banking system on a more permanent basis, and it is typically a low-cost option for central banks because the central banks pay little or no interest. In China, for example, this trade-off is apparent. In periods when the spread between the yield on central bank bills and the rate of remuneration on required reserves widened (eg in 2008 and 2011; Graph 5, left-hand panel), the People's Bank of China tended to rely more heavily on reserve requirements, instead of central bank bills, to withdraw reserves from the banking system (Graph 5, right-hand panel) (Ma et al (2011)). When the issuance of central bank bills was relatively less expensive, as was the case in the mid-2000s, the People's Bank of China used them instead.

Nonetheless, below-market remuneration on required reserves acts as a tax on domestic banks and thereby promotes the growth of shadow banking, ie the unregulated banking system. A related concern is that high-quality borrowers are the most likely to find alternatives to banks as sources of funding, which could lead over time to a decline in the credit quality of banks' loan portfolios.



<sup>6</sup> In the case of India, the central bank and the government have an agreement under which the government issues the bonds and places the proceeds on deposit with the central bank. From a monetary policy perspective, this is equivalent to the central bank issuing the securities itself.



## Risks

The size and structure of central bank balance sheets generate worrisome dangers, including ...

The size and structure of central bank balance sheets can create a number of policy risks and, in his keynote address at the recent Bank of Thailand-BIS conference, the General Manager of the BIS identified a number of them (Caruana (2011)). He argued, however, that because the materialisation of such risks is not inevitable, prudence dictates caution and vigilance. We provide some historical evidence to assess the growing threats in Asia from three sources: inflation risks, financial instability risks and the dangers arising from financial market distortions.

### *Inflation*

... inflation ...

Traditionally, the rapid expansion of central bank balance sheets has been viewed as leading to growth in the monetary aggregates and, eventually, to higher inflation. In this view, however, the problem is not the size of the balance sheet per se; rather, it is the *rate of increase* in its size that matters. A high rate of increase can push the expansion of monetary liabilities beyond the ability of the financial system to absorb them in a manner consistent with balanced growth; at that point, inflationary pressures will be generated. Central banks may, however, be able to offset the effect on monetary liabilities by relying on the expansion of the non-monetary liabilities of the central bank.

In fact, the data suggest that the expansion of central bank balance sheets in emerging Asia does not pose an imminent risk of higher inflation. Central bank accumulations of foreign exchange reserves have reduced inflation pressures by sterilising the foreign exchange purchases via non-monetary liabilities and higher required bank reserves. The combination of this sterilisation and active monetary policy preserved price stability over the past decade and avoided excessive growth of base money despite the rapid accumulation of foreign exchange reserve assets. The effect can be seen by comparing the change in central bank assets with inflation from 2001 to 2011 (Graph 6), which indicates no statistical relationship between the two. The strong reputation for price stability built up over the past two decades by the region's central banks has also helped by keeping inflation expectations well anchored. Thus, inflation risks have been contained even in periods when the growth of broad money and credit accompanied the accumulation of foreign exchange assets.<sup>7</sup>

Moreover, the near-term inflation risks posed by expanding central bank balance sheets are generally hard to assess because of the well known long and variable lags in the effects of monetary policy. But two considerations point to the need for continued vigilance. First, the near-term unpredictability notwithstanding, a stable, positive longer-term correlation between central bank monetary liabilities and inflation still appears to hold.<sup>8</sup> Second, the recent good performance of the region's central banks does not guarantee their future

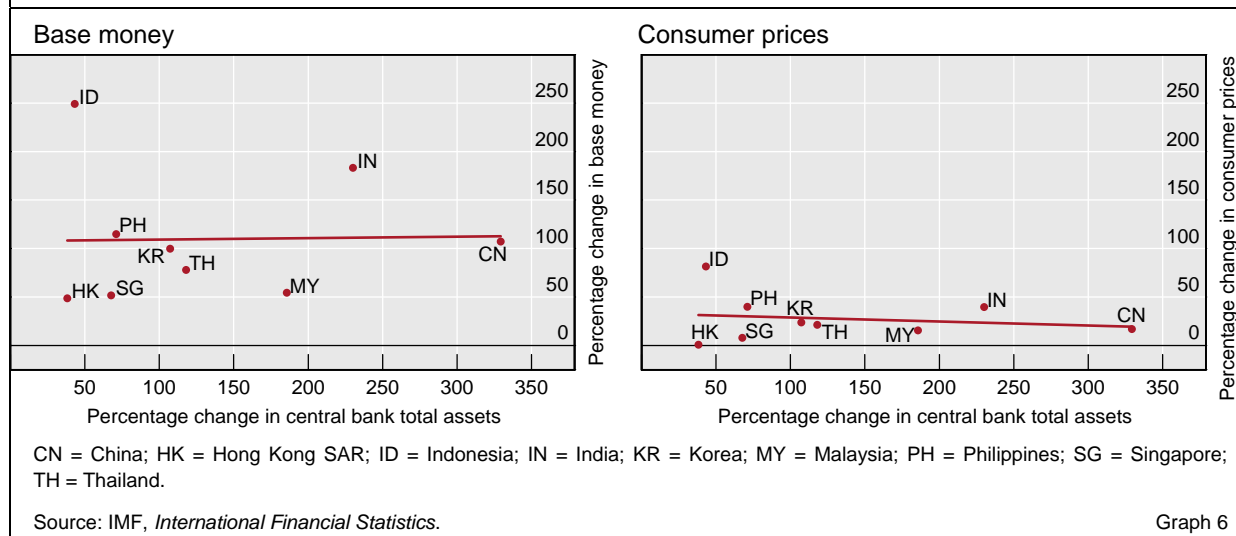
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<sup>7</sup> This is consistent with the analysis of Borio and Disyatat (2010).

<sup>8</sup> See Friedman and Schwartz (1982) for historical examples. BIS (2007, Graph IV.12, p 75) demonstrates that while correlations between money, credit and prices may be weak over short time horizons, it may be too soon to dismiss the relationships over long horizons.

## Growth of central bank assets relative to the growth of money and consumer prices

2001–07



success. History contains numerous cases in which strong growth of central bank liabilities boosted price increases, such as the hyperinflation episodes that followed attempts to override fiscal constraints (Cagan (1956)). Thus, there is no room for complacency.

### Financial instability

One of the risks posed by the accumulation of foreign reserves is that it will crowd out domestic lending. Cook and Yetman (2012) find evidence of this effect over the past decade in the balance sheets of 55 banks in Indonesia, Korea, Malaysia, the Philippines and Thailand. They find that a 1% increase in the level of foreign exchange reserves led to approximately a 1.3% decline in the growth rate of total loans made by banks over 2003–07.<sup>9</sup> The effect arises because the banks ultimately increase their reserve holdings at the central bank and purchase more central bank sterilisation bills. This suggests that significant short-term run-ups of foreign asset reserve holdings would drain resources available for making loans, thereby contributing to domestic, regional and even global macroeconomic volatility in some cases.

... financial instability ...

Another risk is that the persistent expansion of central bank balance sheets may eventually lead private banks to rapidly expand credit, which could be destabilising. Over time, the massive accumulation of foreign exchange reserve assets at the central bank will generally result in an increase in low-yielding assets on the books of the private sector banks (assets that are sometimes called “lazy assets” because the commercial banks earn an interest margin on them without much effort). The composition of the lazy assets will depend on how the central bank finances its accumulation of foreign reserve assets. For

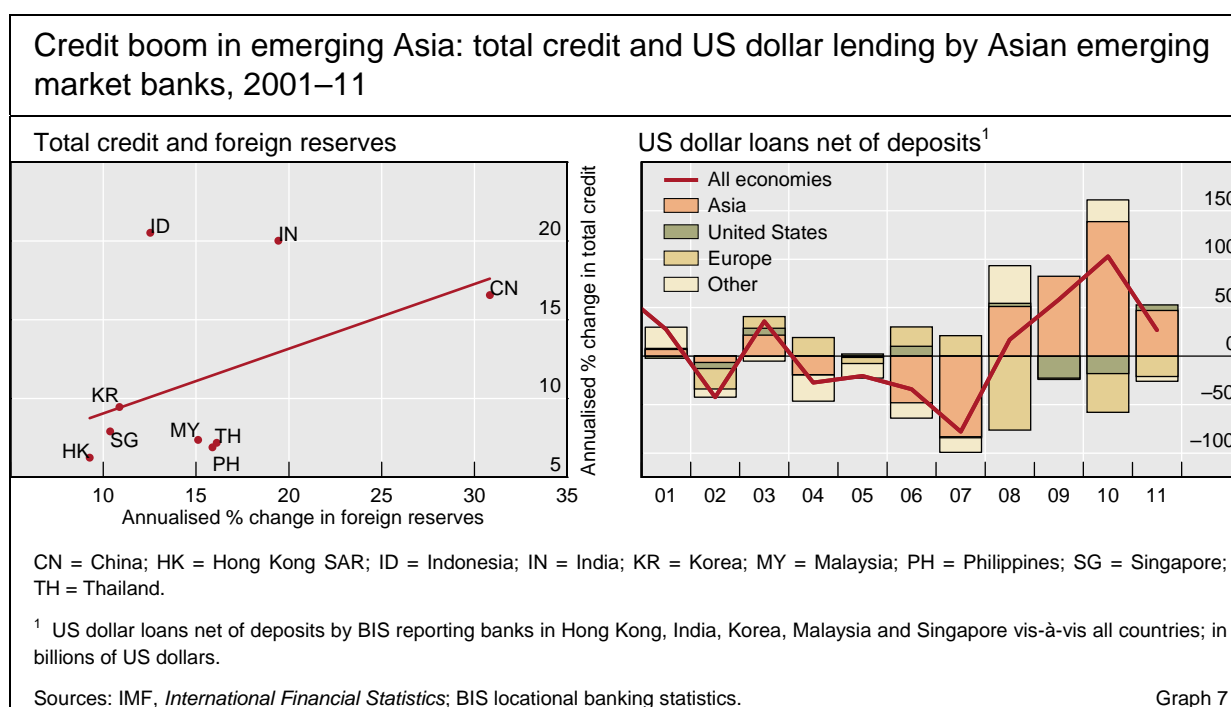
<sup>9</sup> Similarly, Ho and McCauley (2008) report a negative relationship between reserve accumulation and the change in the loan-to-deposit ratios in Asia. This leaves open the question as to whether loans or deposits are driving the change. The results in Cook and Yetman (2012) suggest that declining loans are the primary driver.

example, central bank bills in emerging markets typically wind up on the balance sheets of the private sector banks.

The willingness of banks to hold these central bank securities will vary according to the macroeconomic and financial environment. When risk aversion is high, as it has been in emerging Asia for some time now, banks may find themselves being quite content to sit on these lazy assets. But as economic and financial conditions change, so will the willingness of banks to keep low-yielding assets on their balance sheets. The concern is that, at the time that the global recovery begins to gain traction and global risk aversion falls, these emerging market banks will attempt to either sell low-yielding assets to increase more profitable bank loans or leverage up to increase their return on equity. This search for yield would tend to amplify the boom phase of the recovery and eventually raise concerns of unsustainable lending and asset price growth.

Some evidence on credit growth from the region may be consistent with such dynamics: the rate of credit growth has been rapid in several economies where foreign reserves have also grown rapidly, particularly China and India (Graph 7, left-hand panel).<sup>10</sup>

The US dollar exposures of emerging Asian banks also display a worrisome trend consistent with a credit boom. These banks have been very active in extending US dollar loans without a corresponding increase in US dollar deposits in recent years (Graph 7, right-hand panel).<sup>11</sup> The willingness of central banks to resist currency appreciation appears to have encouraged private banks to take



<sup>10</sup> Given the evidence in Graph 7, the causality between credit growth and foreign reserve asset accumulation could go either way. Rapid domestic credit growth leading to increased asset price returns would tend to draw increased capital inflows and hence foreign exchange reserve accumulation if authorities resist currency appreciation.

<sup>11</sup> See also Borio et al (2011) for further evidence on cross-border lending behaviour in Asia.

on additional foreign exchange rate risks (in the form of either currency mismatch risks or – if the banks swap out the foreign exchange rate risk in financial markets – counterparty risks).

To mitigate this risk of excessive credit growth, central banks could always rely on their domestic policy tools. To date, however, the stance of monetary policy in emerging Asia has remained distinctly accommodative: real policy interest rates are very low, and in some cases negative, despite shrinking output gaps. Moreover, the policy response may prove to be too cautious (Hannoun (2012)), in which case central banks may find themselves behind the curve. This is more likely to be the case if central banks find themselves focusing too much on the short-run costs of tightening monetary policy and too little on the risks associated with burgeoning balance sheets. For example, raising yields on sterilisation bills would increase the cost to central banks of sterilising the impact of past foreign reserve asset purchases. And a rapid increase in policy interest rates may be seen as disproportionately affecting the interest-sensitive sectors of the economy. History contains many instances of central banks struggling to limit bank credit expansion when the balance sheets of private sector banks are unusually liquid. Too rapid an expansion would have well known negative consequences for economic and financial instability.<sup>12</sup>

#### *Financial market distortions*

Another concern relates to distortions in financial markets. When an emerging market central bank finances its accumulation of foreign exchange assets with local currency assets traded in markets that are relatively thin, it tends to become the dominant player in the market.<sup>13</sup> In those cases, distortions can arise from various sources.

... and financial market distortions

First, in pricing securities, central banks can have objectives that differ from those of the private sector, so their operations may distort interest rates and impair the efficient allocation of savings.<sup>14</sup> Second, market participants may underweight private signals, so prices will tend to respond primarily to the expected moves of the central bank rather than to economic developments. Third, the sheer size of some central bank operations may displace the private

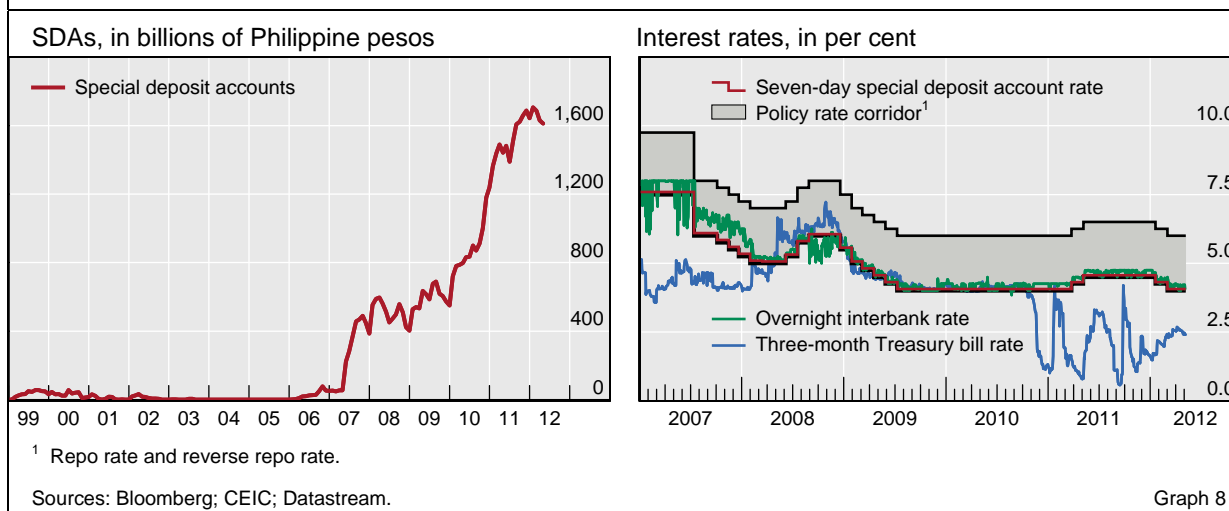
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<sup>12</sup> Note also that the massive expansion of central bank balance sheets in the western advanced economies, conducted as part of their response to the international financial crisis, may be contributing to financial stability risks in emerging Asia. Chen et al (2012) find evidence that large-scale asset purchases by the US Federal Reserve lowered yield curves in Asia as well as in the United States. The lower interest rates have driven up credit and asset prices in a number of Asian economies. For a further discussion of the issues associated with the transmission of central bank balance sheet expansions, see Iwata and Takenaka (2012), who emphasise the exchange rate and terms of trade channels. For a more positive perspective on the role of central bank balance sheet policies, see Chadha et al (2012).

<sup>13</sup> Mehrotra (2012) notes that the outstanding stock of central bank paper in some Asian economies now exceeds 10% of GDP. But it is also true that, because central bank operations in local currency assets help banks manage their reserves more effectively, the operations over time should encourage the deepening of domestic financial markets.

<sup>14</sup> Sometimes, however, central banks want to use balance sheet expansions to directly influence private sector incentives. For example, quantitative easing in the advanced economies is explicitly intended to alter the yield curve and hence the allocation of savings from what would otherwise be the case.

## Special deposit accounts and interest rates of the Philippines



sector in financial intermediation. Finally, heavy reliance on the central bank in the financial intermediation process can stifle financial market development, especially in emerging market economies.<sup>15</sup>

One interesting example of distortion is currently playing out in the Philippines. The aggregate size of the central bank's special deposit accounts (SDAs),<sup>16</sup> introduced to withdraw excess liquidity from the market, has skyrocketed since 2007 (Graph 8, left-hand panel); they are now approximately twice as large as the total required reserves of depository institutions. One result has been the convergence of the overnight interest rate to the SDA rate, which runs slightly above the floor of the policy rate corridor (Graph 8, right-hand panel). The expansion of the SDAs has been associated with greater reliance on the SDA rate, rather than the short-term Treasury bill rate, as a benchmark for pricing fixed income instruments; the three-month Treasury bill rate has been quite volatile since late 2010.

### Additional policy challenges ahead

Large balance sheets pose a number of other ongoing challenges for monetary policy.

#### *Central bank finances, independence and credibility*

Large balance sheets are weakening central bank finances in Asia

Large balance sheets leave central banks vulnerable to large financial losses (Filardo and Grenville (2012)). These potential losses can mount in a variety of ways. First, the central bank's return on its foreign assets is typically less than

<sup>15</sup> Monetary policy operations can also play a positive role in certain circumstances. McCauley (2008) discusses how monetary policy operations can contribute to financial market development and Durré and Pill (2012) emphasise how operations can help overcome market distortions during crisis periods.

<sup>16</sup> SDAs are fixed-term investment deposits available to banks and trust entities of financial institutions supervised by the Philippine central bank, which in turn uses the accounts to manage the reserves of the banking system.

the running cost of financing these foreign assets. That is, the assets may yield less than the costs of central bank bills and the interest rate paid on excess reserves. Second, the central bank incurs losses on the domestic value of its foreign exchange reserve assets when its domestic currency appreciates. Third, the assets on the balance sheets of central banks may be subject to mark-to-market losses as creditworthiness deteriorates and market interest rates rise. In some cases, losses could also be realised because of a credit event.

Admittedly, such losses can affect the profit and loss statement of a central bank and reduce its capital without directly threatening its ability to achieve policy goals; indeed, the losses may be fully consistent with those goals. But the accumulation of losses can have indirect effects. A particular concern is the reporting of large losses; the news could raise questions about the reputation of the central bank, and if a central bank has to go cap in hand to the treasury or legislature for an injection of capital, it may find its independence at risk. A recent BIS report analyses the implications of financial risks for central bank governance arrangements.<sup>17</sup>

### *Exit strategies*

The three risks outlined above – inflation, financial instability and market distortions – need to be carefully managed and thus merit further analysis. Serious consideration should also be given to capping and then shrinking the size of central bank balance sheets. Indeed, the central banks of India, Korea and Malaysia reduced their holdings of foreign assets during the international financial crisis (Graph 9) in response to extreme exchange rate volatility and capital outflows. Other central banks, including those of the Philippines and Thailand, were reluctant to allow their long positions to decrease during the crisis because of concerns about the potential for credit rating downgrades and their knock-on effects. In recent months, outright and net forward positions have declined somewhat further in some regional economies.

Exit strategies  
entail difficult policy  
choices

Limiting the expansion of central bank balance sheets may be easier said than done. After all, the massive expansion in Asia in recent years was often the by-product of exchange rate regimes that resisted exchange rate pressures. Greater tolerance of currency appreciation over time could be a key element of a framework to limit further accumulation of foreign assets.<sup>18</sup> The economics that would guide the pullback and the central bank operations to achieve it are both fairly straightforward, but the political economy issues are more complex.

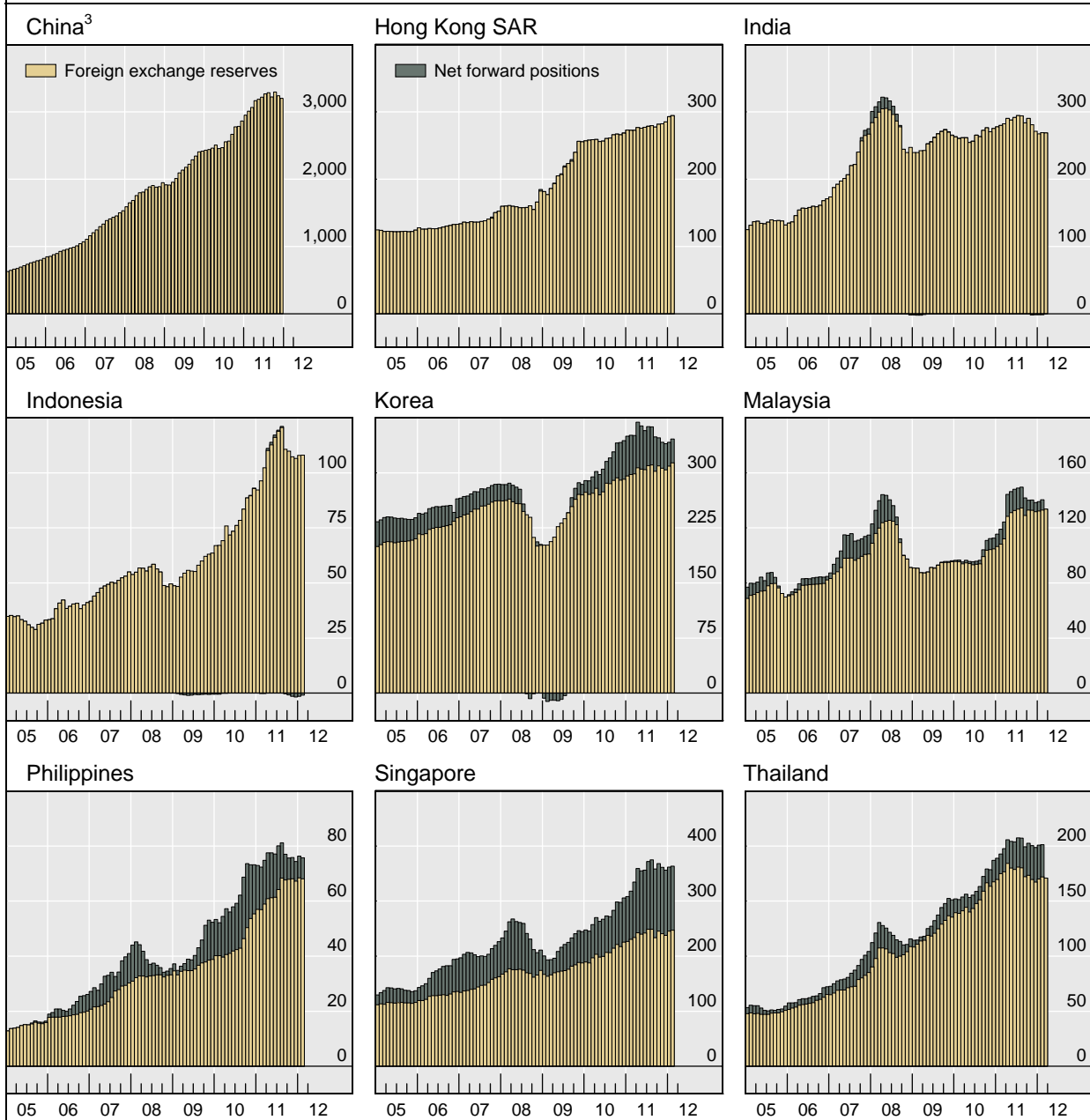
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<sup>17</sup> BIS (2011, pp 45–7). See also Trairatvorakul (2012) for a discussion of the various economic and political costs associated with the build-up of foreign reserves.

<sup>18</sup> In addition, Gagnon (2012) argues that the large accumulation of foreign exchange assets at central banks has driven a substantial portion of global current account imbalances. Hence, exiting would contribute significantly to the global economic recovery.

## Foreign exchange reserves<sup>1</sup> and net forward positions<sup>2</sup>

In billions of US dollars



<sup>1</sup> Official reserves excluding gold. Includes SDR and reserve positions in the IMF. <sup>2</sup> Long positions in forwards and futures in foreign currencies vis-à-vis the domestic currency, minus short positions. <sup>3</sup> Data of net forward positions are not available for China.

Sources: IMF, *International Financial Statistics* and *International Reserves and Foreign Currency Liquidity*; national data.

Graph 9

## Conclusions

The rapid expansion of central bank balance sheets arising from many years of foreign exchange reserve accumulation in emerging Asia is raising concerns about inflation, financial instability and financial market distortions. Serious deterioration in these areas has not yet materialised, but analysis highlights the need for a further careful assessment of both the historical record and current institutional arrangements. The recent Bank of Thailand-BIS conference made some progress in clarifying the implications of these developments. Further

analysis is needed. Financial stability risks can take many forms and must not be underestimated. Credit developments in emerging Asia might be more worrying in light of the soaring central bank balance sheets. At the operational level, the management of ballooning central bank balance sheets raises concerns about distortions in financial markets and implications of central bank losses.

The temptation to look only at the size and composition of central bank balance sheets should be tempered by the fact that they are a by-product of underlying public policies and the choice of instruments to implement those policies. To improve the health of the balance sheets, central banks and governments would have to reflect on how they should alter such policies. The approach to exchange rate management by countries in emerging Asia is a critical factor, and various reform efforts are currently being considered. Although such efforts are largely driven by the implications of exchange rate management for global imbalances and growth, the risks associated with the size and structure of central bank balance sheets should not be overlooked.



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## Appendix: Composition of central bank assets and liabilities in Asian emerging economies

<b>Assets</b>								
In billions of US dollars								
	Foreign assets		Claims on financial sector		Claims on public sector		Other claims	
	2002	2011	2002	2011	2002	2011	2002	2011
China	280.80	3,775.62	235.92	331.56	34.60	244.40	2.50	0.40
Hong Kong SAR	106.81	280.47	...	...	...	...	...	...
India	70.36	285.67	2.25	1.73	24.78	84.84	...	...
Indonesia	32.86	110.37	1.89	0.49	34.32	36.39	4.11	1.33
Korea	130.97	308.61	5.77	3.50	8.29	13.98	...	...
Malaysia	34.58	133.29	1.66	11.34	0.16	0.63	6.28	3.47
Philippines	16.42	75.77	0.61	0.67	3.96	6.77	1.08	1.83
Singapore	82.19	237.20	...	...	3.34	5.24	...	...
Thailand	39.29	176.89	1.93	...	2.50	8.84	10.14	...

Source: IMF, *International Financial Statistics*. Table A1

<b>Liabilities</b>										
In billions of US dollars										
	Currency in circulation		Bank reserves <sup>1</sup>		Central bank securities <sup>2</sup>		Government deposits		Other liabilities	
	2002	2011	2002	2011	2002	2011	2002	2011	2002	2011
China	208.74	805.42	336.59	2,774.24	17.97	370.37	37.28	360.80	-49.41	37.68
Hong Kong SAR	14.49	31.94	17.07	106.62	...	...	38.69	85.44	-5.40	-16.67
India	54.34	183.63	17.25	78.14	...	...	0.03	0.03	24.39	109.17
Indonesia	11.01	41.13	17.82	83.20	...	1.03	12.85	9.88	17.97	4.61
Korea	16.75	36.19	15.29	33.36	88.46	153.59	9.42	6.39	3.15	93.78
Malaysia	7.14	19.48	24.31	84.31	...	...	1.96	6.31	1.31	27.94
Philippines	5.12	12.79	4.78	59.72	...	...	1.49	3.68	6.24	...
Singapore	7.12	18.98	4.38	15.95	...	...	54.36	110.80	19.67	96.72
Thailand	12.96	39.40	5.85	80.28	2.60	29.88	1.55	12.55	-6.81	5.01

<sup>1</sup> Reserves and deposits of banks. <sup>2</sup> Including central bank bonds.  
Source: IMF, *International Financial Statistics*. Table A2