BANK FOR INTERNATIONAL SETTLEMENTS

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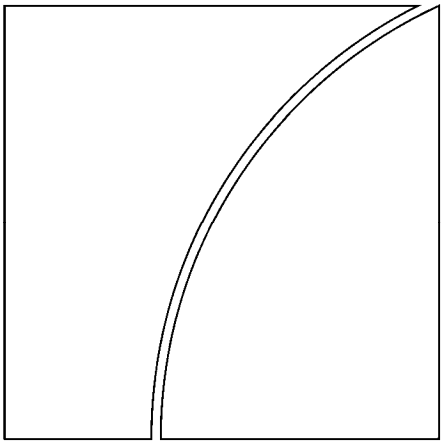
September 2011



International banking and financial market developments

BIS Quarterly Review
Monetary and Economic Department

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Special features

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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Global growth and sovereign debt concerns drive markets[1]

Sharp downward revisions to the strength of recovery in several major economies, particularly in the developed world, drove down the prices of growth-sensitive assets during the review period. Market participants' concerns about growth were amplified by perceptions that monetary and fiscal policies had only limited scope to stimulate the global economy. The negative news about macroeconomic conditions was compounded by concerns about euro area sovereign debt spreading from Greece, Ireland and Portugal to Italy and Spain. This led to tighter funding conditions for European banks and even affected pricing in euro area core sovereign debt markets. All of these developments led to flows into safe haven assets. Table 1 summarises the major events that affected expectations for global growth and sovereign debt markets during the review period.

Scope for policy support questioned as recoveries falter

Signs of faltering growth drive risky asset prices lower ...

Developments in financial markets during the period under review largely reflected substantial downward revisions of market participants' expectations of growth in several major economies. Over this period, global equity prices declined by 11% on average, with larger falls in Europe and slightly smaller falls in emerging market economies (EMEs). Large declines in prices of cyclically sensitive assets pulled down average prices (Graph 1, left-hand panel). Corporate credit spreads generally widened, with greater increases for lower-rated debt, which is more vulnerable to non-payment in a downturn (Graph 1, centre panel). In addition, reflecting expectations of weaker demand for these key production inputs, prices of energy and industrial metals decreased sharply (Graph 1, right-hand panel).

... particularly between late July and mid-August

Much of the reassessment of growth trajectories occurred between late July and mid-August. Growth-sensitive asset prices dropped particularly sharply during this period. On 29 July, new US GDP figures showed not only that growth in the second quarter was weaker than expected, but also that the level of GDP was around 1% lower than previously recorded. In Europe, growth

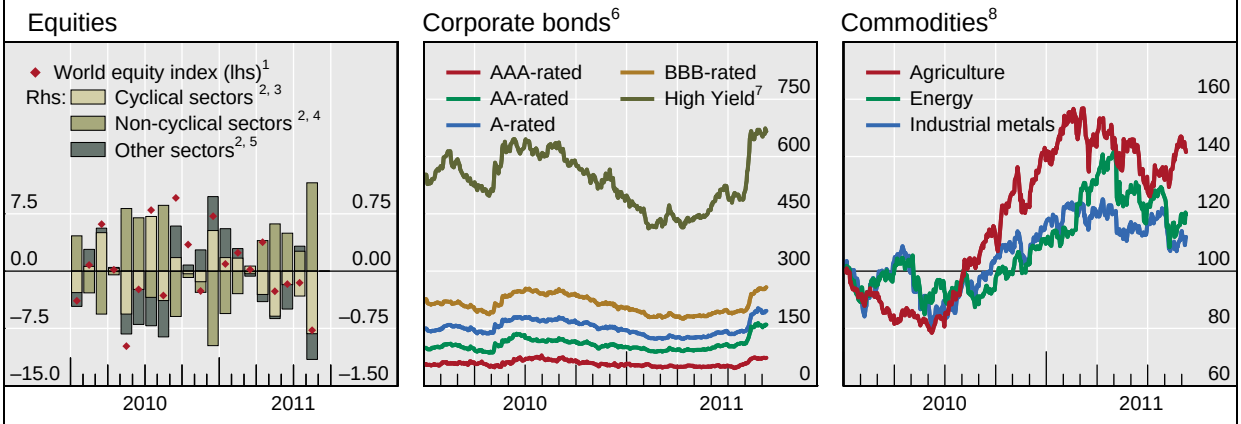
[1] This article was produced by the BIS Monetary and Economic Department. The analysis covers the period to 8 September 2011. Questions about the article can be addressed to nick.vause@bis.org or goetz.vonpeter@bis.org. Questions about data and graphs should be addressed to magdalena.erdem@bis.org and garry.tang@bis.org.

Major events that drove developments in financial markets	
07 Jul	The ECB raises its main policy rate by 25 basis points to 1.5%.
13 Jul	Fitch downgrades its sovereign credit rating for Greece from B+ to CCC.
15 Jul	The European Banking Authority publishes the results of stress tests for 90 banks.
21 Jul	A euro area summit agrees a new financial assistance package for Greece and lower interest rates on loans from the European Financial Stability Facility for Greece, Ireland and Portugal.
25 Jul	Moody's downgrades its sovereign credit rating for Greece from Caa1 to Ca.
27 Jul	Brazil introduces a 1% transaction tax on certain foreign exchange derivatives trades.
	Standard & Poor's downgrades its sovereign credit rating for Greece from CCC from CC, maintaining a "negative outlook".
29 Jul	Weaker than expected US GDP data are released.
01 Aug	Weak surveys of purchasing managers in Asia, Europe and the United States are published.
02 Aug	The US Congress agrees to raise the limit on federal government debt on the date by which the US Treasury had forecast it could be reached.
03 Aug	The Swiss National Bank narrows its target rate for three-month CHF Libor and announces a significant increase in the supply of Swiss francs to the money market.
04 Aug	The Bank of Japan announces a ¥10 trillion expansion of its asset buying programme and intervenes in the foreign exchange market, selling yen.
	The ECB announces a special facility to supply six-month funds and resumes purchases of euro area sovereign bonds.
05 Aug	US Treasury bill yields fall to negative values as Bank of New York Mellon announces deposit charges.
08 Aug	Traders report that the Eurosystem bought Italian and Spanish government bonds.
09 Aug	The Federal Reserve declares its intention to hold its policy rate exceptionally low until at least mid-2013.
12 Aug	Selective bans on short selling are introduced in four euro area countries.
16 Aug	Weak second quarter EU GDP data are released.
26 Aug	Chairman Bernanke's Jackson Hole speech notes that additional tools for US monetary stimulus are still available.
	Chinese banks report that they will need to include margin deposits in their reserve requirements at the central bank.
01 Sep	More weak surveys of purchasing managers in Asia, Europe and the United States are published.
02 Sep	Weaker than expected US employment data are released.
06 Sep	The Swiss National Bank starts intervening in the foreign exchange market, selling Swiss francs to target a value of the currency no stronger than CHF 1.20 per EUR.
07 Sep	The German constitutional court rejects challenges to the Greek rescue package, and France, Italy and Spain approve budget savings, tax increases and deficit limits, respectively.
08 Sep	President Obama proposes a $447 billion fiscal stimulus package to Congress.

Table 1

slowed markedly in the second quarter, according to data published on 16 August, with a particularly sharp deceleration in Germany. Furthermore, survey-based indicators pointed to an additional slowdown in the third quarter. For example, purchasing manager surveys published on 1 August indicated that growth in manufacturing activity had slowed across Asia, Europe and the United States in July. Global equity prices fell by 2% on average on the following day. The S&P 500 Index of US equity prices then declined by 4.5% on 18 August, when a measure of US manufacturing activity in August published by the Federal Reserve Bank of Philadelphia plunged to levels only

Growth-sensitive asset prices



[1] Monthly changes in Datastream World Equity Index, in per cent. [2] Sectoral contributions to changes in world equity index relative to overall monthly changes, in percentage points. [3] Basic materials, finance, industrials and oil & gas sectors. [4] Consumer goods, consumer services, telecommunications and utilities sectors. [5] Health care and technology sectors. [6] Corporate bond asset swap spreads over Libor, in basis points. [7] Bank of America Merrill Lynch High Yield Master II index. [8] S&P GSCI price indices, 4 January 2010 = 100.

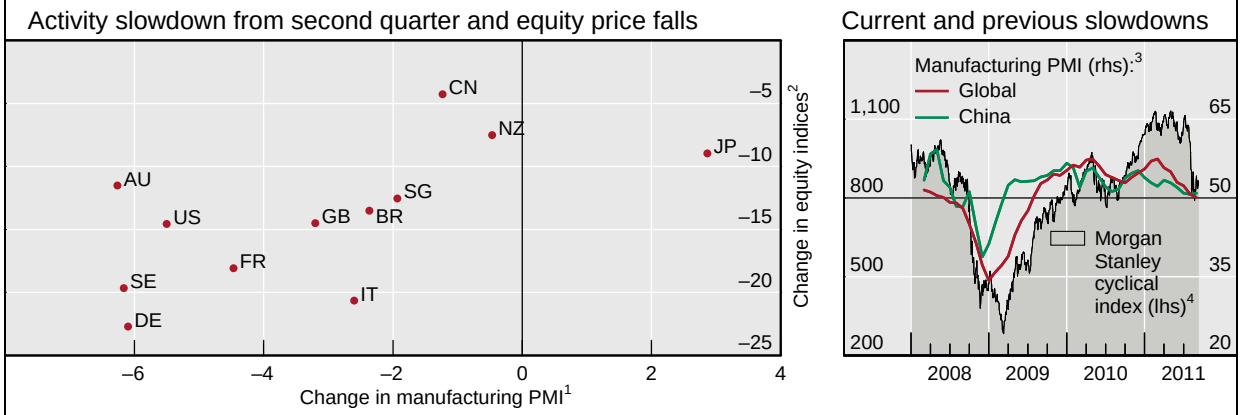
Sources: Bloomberg; Datastream; Merrill Lynch; BIS calculations. Graph 1

previously recorded shortly before or during recessions. Throughout the late July to mid-August period, some of the largest falls in equity prices occurred in countries for which survey-based indicators pointed to the sharpest third quarter growth slowdowns (Graph 2, left-hand panel).

Prices fall sharply due to perceived limits for growth stimulus …

It may be recalled that economic growth also appeared to be faltering in mid-2010. But growth-sensitive asset prices did not fall as sharply then as they have in the past few months (Graph 2, right-hand panel). In mid-2010, market participants expected that additional monetary and fiscal easing would support growth. And, those expectations turned out to be correct, as US authorities cut

Survey-based indicators of economic activity and equity prices



AU = Australia; BR = Brazil; CN = China; DE = Germany; FR = France; GB = United Kingdom; IT = Italy; JP = Japan; NZ = New Zealand; SE = Sweden; SG = Singapore; US = United States.

[1] Change in manufacturing purchasing managers index (PMI) between the July reading and the average reading in the second quarter of 2011. [2] Percentage change in Datastream equity indices between 26 July 2011 and 18 August 2011. [3] Levels above 50 indicate an expansion of activity, while levels below 50 indicate a contraction of activity. [4] Index of equity prices of 30 cyclical US companies.

Sources: Bloomberg; Datastream; BIS calculations. Graph 2

payroll taxes, extended the duration of income tax cuts and unemployment benefits, and launched a second round of quantitative easing. At the same time, local governments in China provided more financing for infrastructure and housing developments.

In contrast, market participants currently report that they see only limited scope for macroeconomic easing to support growth, including in some EMEs. As a result, they do not expect EMEs to drive global growth as strongly as previously. With all of this in mind, forecasters marked down their projections of growth in several major economies for 2012 and 2013, as well as the remainder of 2011. Prices of cyclically sensitive equities fell more sharply than they did in mid-2010 (Graph 2, right-hand panel).

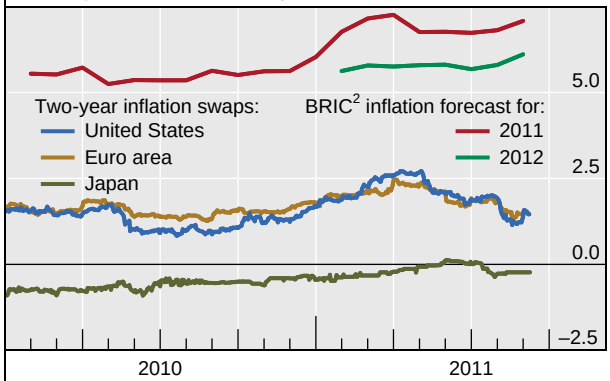
... from both monetary policy ...

Given that major developed economy central banks have had little or no scope for further policy interest rate cuts for some time, market participants watched for signals that authorities would engage in alternative forms of monetary stimulus. Expectations of such measures increased as some inflation pressures diminished during the review period. Many commodity prices fell, for example, leading to lower inflation expectations implied by swap contracts for some major developed economies (Graph 3, left-hand panel).

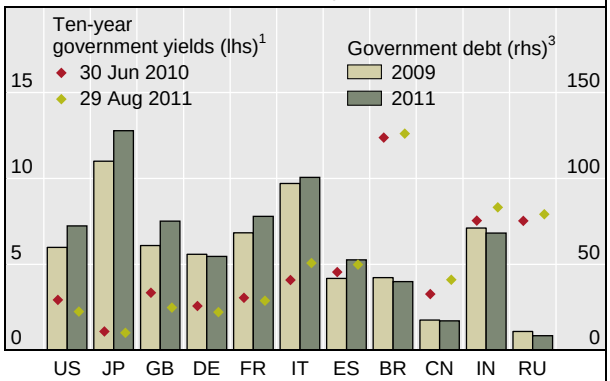
In the United States, the Federal Reserve announced on 9 August that it expected to keep its policy rate at exceptionally low levels until at least mid-2013. This pushed down federal funds futures rates (Graph 4, left-hand panel) and, hence, longer-term interest rates and boosted US and international equity prices. Equity prices also increased somewhat after Chairman Bernanke's Jackson Hole speech on 26 August. This noted that a range of tools to provide additional monetary stimulus remained available to the Federal Reserve, use of which would be discussed at an extended monetary policy meeting towards the end of September.

Factors affecting the scope for monetary and fiscal stimulus

Two-year inflation swap rates[1]



Government debt stocks and yields



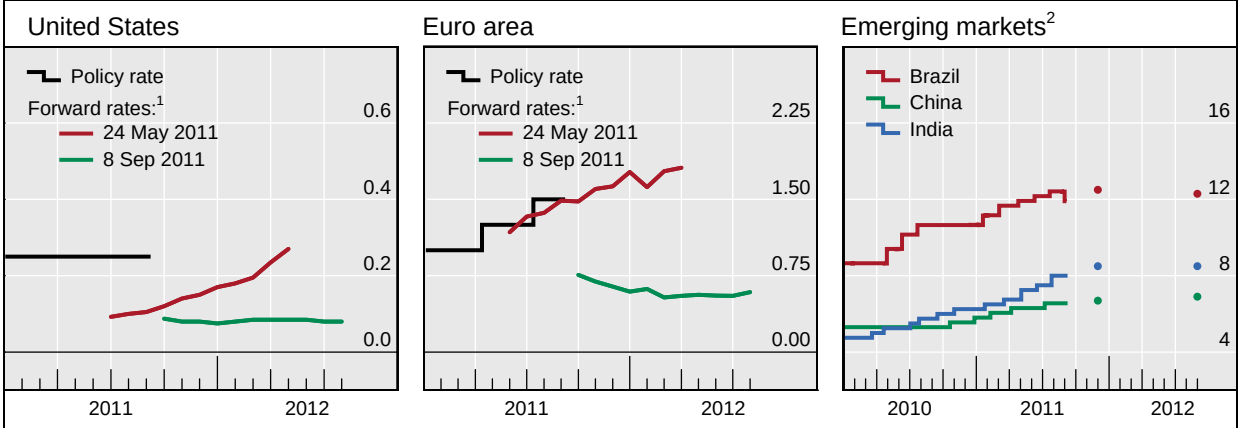
BR = Brazil; CN = China; DE = Germany; ES = Spain; FR = France; GB = United Kingdom; IN = India; IT = Italy; JP = Japan; RU = Russia; US = United States.

[1] In per cent. [2] Simple average of inflation forecasts for Brazil, China, India and Russia. [3] Net general government debt as a percentage of GDP; for China, India and Russia, gross government debt as a percentage of GDP. End-of-year values. Forecast for 2011.

Sources: IMF, *World Economic Outlook*; Bloomberg; © Consensus Economics; BIS calculations. Graph 3

Short-term interest rates

In per cent



[1] For the United States, federal funds futures; for the euro area, one-month EONIA forward rates implied by overnight index swaps. [2] For Brazil, SELIC rate; for China, one-year lending rate for working capital; for India, repo rate. Dots indicate latest forecasts as reported by Consensus Economics.

Sources: Bloomberg; © Consensus Economics; JPMorgan Chase. Graph 4

Meanwhile, on 4 August the Bank of Japan announced a ¥10 trillion expansion of its asset buying programme, with the TOPIX index of Japanese equity prices subsequently maintaining its value amid sharp falls in other major international equity price indices.

Investors also reassessed the prospects for monetary policy in the euro area and in EMEs. The ECB raised its main policy rate by 25 basis points to 1.5% on 7 July to help anchor inflation expectations. In response to news about weakening economic activity, however, prices of futures on short-term interest rates in the euro area started to decline shortly afterwards (Graph 4, centre panel). Some EME central banks also raised policy interest rates during the period under review, including in China and India. The People's Bank of China further tightened monetary policy by broadening the scope of reserve requirements to cover margin deposits after inflation reached a three-year high of 6.5% in July. In contrast, the central banks of Brazil and Turkey cut policy rates in reaction to signs of slower growth. But with expectations of inflation in the major EMEs remaining elevated (Graph 3, left-hand panel), forecasters predict that short-term interest rates in these countries will stay close to current levels through to the second half of 2012 (Graph 4, right-hand panel).

... and fiscal policy

With high and rising stocks of government debt, market participants also reported that they perceived less scope for advanced economies' fiscal policies to be loosened than had been the case in mid-2010 (Graph 3, right-hand panel). In the euro area, IMF-EU programmes tied some heavily indebted governments to fiscal consolidation, while others followed the same course due to the high compensation demanded by investors to hold their bonds (Graph 3, right-hand panel). In contrast, investors were willing to finance deficits of the US government at ever lower interest rates. However, few expected additional fiscal stimulus, at least during the early part of the review period. Indeed, President Obama signed an agreement on 2 August to cut planned spending while raising the statutory ceiling on government debt. Investors then

interpreted Standard & Poor's credit rating downgrade of US long-term debt from AAA to AA+, which took place on 5 August, as increasing the urgency of fiscal consolidation, which would weigh on medium-term growth. This contributed to a fall of over 6% in the S&P 500 Index on the next business day. By early September, however, further signs of weakness in the US economy led the US President to propose a $447 billion fiscal stimulus package to Congress, although the reaction of equity markets was muted.

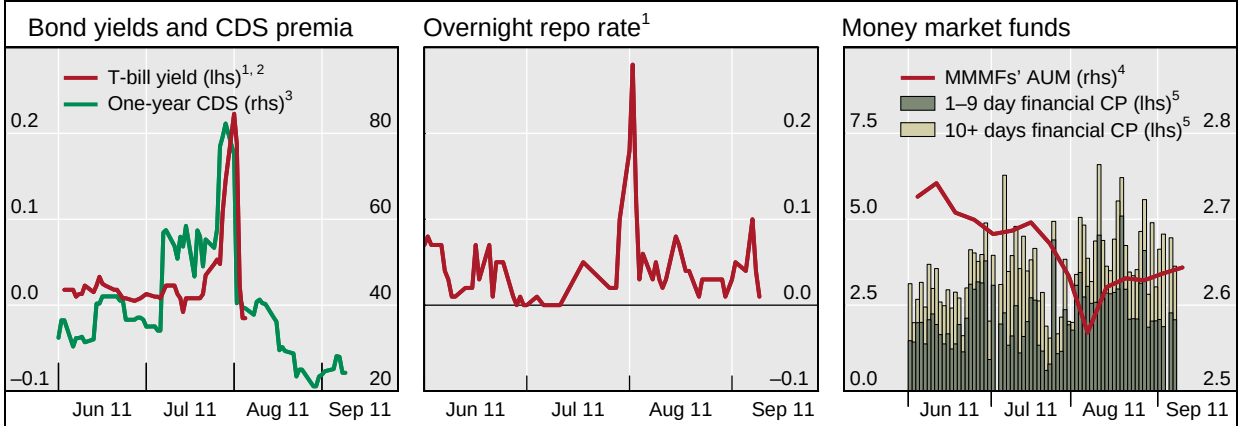
Market participants also thought that additional fiscal stimulus was unlikely to be introduced in the near term in many EMEs. Although debt stocks are in several cases lower than in advanced economies, fiscal stimulus would put upward pressure on exchange rates, which have appreciated further during the review period in a number of EMEs.

No lasting effects of the US debt ceiling negotiations and downgrade

The near breach of the US debt ceiling generates some short-lived stresses in money markets ...

The US debt ceiling negotiations generated some short-lived stresses in money markets. Reaching the ceiling would have forced the federal government to choose whom it would pay. This politically extremely unappealing prospect led most market participants to expect that an agreement would be reached to allow the debt ceiling to be raised. Such an agreement was signed on 2 August, the day that the US Treasury had estimated its ability to borrow would otherwise have been exhausted. During the preceding days of negotiations, securities and derivatives prices had begun to reflect a non-negligible probability that the US government would default. The yield on the US Treasury bill maturing on 4 August, for example, jumped from close to zero to over 20 basis points, while premia on credit default swaps (CDS) offering insurance against US default within a year increased from around 30 to almost 80 basis points (Graph 5, left-hand panel). Interest rates on overnight repos, typically used by banks to raise a significant portion of their funding,

Effects of the US debt ceiling negotiations on money markets



[1] In per cent. [2] For bills maturing on 4 August 2011. [3] Euro-denominated, in basis points. [4] US money market mutual funds' assets under management, in trillions of US dollars. [5] Issuance of AA-rated commercial paper by financial institutions with maturities between 1 and 9 days and of 10+ days, respectively, in billions of US dollars.

Sources: Federal Reserve Board; Bloomberg; Investment Company Institute; Markit. Graph 5

climbed suddenly from around zero to almost 30 basis points (Graph 5, centre panel). US money market funds, which invest heavily in US Treasury securities, experienced redemptions, although they had prepared by substituting cash for less liquid assets, such as financial commercial paper (CP), in their portfolios (Graph 5, right-hand panel). Once the debt ceiling was raised, these effects quickly dissipated.

... while the sovereign downgrade leads to little forced selling

The decision of Standard & Poor's to downgrade US long-term debt did not appear to trigger mechanisms that could have led to sharp falls in the prices of US Treasury securities and other assets. Haircuts on US Treasury securities accepted in repurchase agreements, for example, did not increase to the extent of forcing borrowers to sell assets that they were no longer able to finance. Indeed, the Depository Trust & Clearing Corporation did not change haircuts on the repurchase agreements that it clears. Similarly, US banks were not forced to liquidate assets, because federal regulators held constant the risk weight applied to securities issued or guaranteed by the US Treasury, its agencies or sponsored enterprises in determining regulatory capital ratios. There was little forced selling by asset managers, as mandates to hold only AAA-rated securities are very rare. Finally, few institutions were forced to find alternative collateral to support positions in other securities or derivatives.

The euro area sovereign debt crisis intensifies

The concerns over a worldwide growth slowdown added fuel to the euro area sovereign debt crisis. A broad-based global recovery had been viewed as an important avenue for reducing public debt burdens. Following disappointing macroeconomic releases from around the world, the focus turned to the question of where the necessary growth might come from at a time when policymakers were running out of ammunition. With a US slowdown, faltering growth in France and Germany and declining momentum from emerging markets, market participants followed euro area developments with increasing anxiety amid political uncertainty.

Renewed tensions in the euro area periphery ...

Market prices reflected the concern that the sovereign debt crisis was spreading progressively from the periphery to the core of the euro area. Reassessments of the repayment capacities of Greece, Ireland and Portugal, and increasing doubts over their ability to return to bond markets in the time specified in official support programmes, continued to drive the price of sovereign debt (Graph 6, left-hand panels). CDS spreads referencing the three sovereigns rose from April to June, spiking up in July, until the euro area summit on 21 July brought them down from record levels.

The support measures announced at the summit were at the top end of market expectations. They included a second Greek rescue package of €109 billion from the European Financial Stability Facility (EFSF) and the IMF. A relief rally reduced the two-year bond yields of Greece and the other programme countries by hundreds of basis points, with less movement at longer maturities. Lower interest rates and longer maturities on future EFSF loans and a bond exchange involving private investors lowered the future debt servicing burden, although the extent of private sector involvement depended

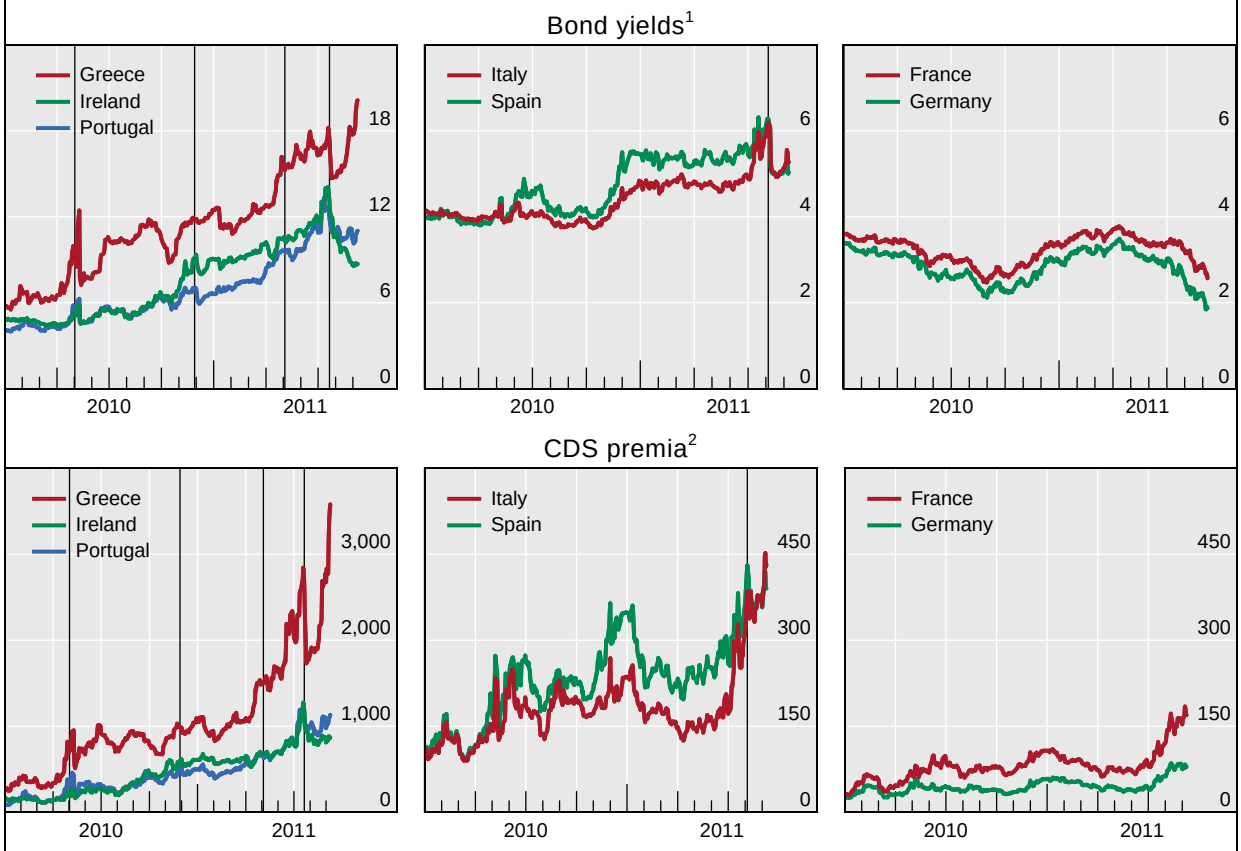
on which of the several options were finally chosen. Even though the voluntary nature of the exchange meant, according to the International Swaps and Derivatives Association, that it would not trigger a credit event, rating agencies interpreted the exchange as a selective default and continued to downgrade Greece's sovereign rating.

... spill over to Italy and Spain ...

From July through August, contagion spread to the large southern European countries on concerns over growth and the limited size of the EFSF. Perceptions that planned EFSF reforms could prove insufficient should more countries lose access to market funding led to a widening of Italian and Spanish yield spreads. The rises in yields and in the cost of credit protection on government debt (Graph 6, centre panels) began to undermine the previous belief that Italy and Spain had decoupled from tensions in the euro area periphery. The self-perpetuating dynamics gathered pace through July, with bondholders selling in anticipation of future losses in their portfolios, thereby raising volatility and perceived risk, which led to further selling. As a result, on 4 August, yields on Italian and Spanish government bonds spiked to 6.2%.

Against the backdrop of growing contagion, the Eurosystem reactivated its Securities Market Programme. Of particular significance was the understanding

Euro area sovereign bonds and CDS



The vertical lines in the left-hand panels indicate the dates on which the financial assistance packages were agreed for Greece (2 May 2010), Ireland (28 November 2010), Portugal (4 May 2011) and Greece again (21 July 2011). The vertical line in the centre panels indicates the first date on which the Eurosystem was reported to have bought Italian and Spanish government bonds (8 August 2011).

[1] Ten-year government bond yields, in per cent. [2] Five-year CDS premia, in basis points.

Sources: Bloomberg; Markit. Graph 6

among market participants that the intervention on 8 August involved purchases of Italian and Spanish government bonds for the first time. The scale of purchases, at €22 billion in the week ending 12 August, represented the largest intervention to date, albeit small relative to outstanding stocks of Italian, Spanish and peripheral sovereign bonds. Yet market participants interpreted the intervention as an important signal that the Eurosystem, which many regarded as the most credible buyer at that juncture, would bridge the gap until the EFSF was authorised to purchase debt on the secondary market in the autumn. Over the following days, Italian and Spanish 10-year benchmark yields declined by over 100 basis points to settle below 5%. Actual financing costs came to 5.22% when Italy issued 10-year bonds on 30 August, after backtracking on proposed fiscal consolidation plans. Two days later, Spain was able to issue five-year bonds at a yield of 4.49%, 38 basis points lower than in the previous auction, after the main political parties had agreed on a constitutional deficit limit proposal the week before.

... and affect core markets

Given a deteriorating macroeconomic outlook, fears of contagion also left a mark on euro area core sovereign debt markets. Beginning in July, the cost of credit protection on French and German government debt increased noticeably (Graph 6, right-hand panels). The 10-year spread of French over German bonds rose from 35 basis points at end-May to 89 basis points on 8 August, before falling back to around 65 basis points. These moves tested France's AAA rating following the US credit rating downgrade, as investors fretted about France's structural deficit, low growth rate and potential contingent liabilities to the EFSF in the event of a major sovereign default. German markets also witnessed higher volatility. In one incident on 25 August, the German stock market index plunged 4% within 15 minutes on rumours concerning Germany's AAA rating and over a possible extension of short-selling bans to German markets.

Amid disappointing revisions to growth in the core economies, the French and German leaders' joint statement on 16 August in support of the euro was met with scepticism. In the days that followed, CDS spreads soon returned to their previous levels, and the DAX and CAC equity indices declined by 7% on growth concerns. Market participants considered the proposed measures – which included closer coordination of economic policies, a financial transaction tax and constitutional deficit rules – as lacking in detail and as insufficient for addressing the underlying debt problems. Investors were also disappointed that an expansion of EFSF guarantee commitments beyond €440 billion and the introduction of collectively guaranteed euro bonds had been ruled out in the joint statement. After continued deterioration up to 6 September, markets recorded a short-lived rebound on 7–8 September. Bond yields and CDS spreads fell, while major European equity indices recovered 4%, when France, Italy and Spain demonstrated renewed resolve to implement austerity measures and the German constitutional court rejected challenges to the Greek rescue package and the establishment of the EFSF.

Bank funding conditions deteriorate

The deterioration in sovereign creditworthiness continued to adversely affect banks' funding costs and market access. Sovereign debt problems can affect banks in various ways, ranging from direct losses on sovereign holdings and lower collateral values for wholesale and central bank funding, to the reduced benefits that banks derive from government guarantees, including lower bank ratings.[2] Market participants remained concerned about sovereign exposures after the European Banking Authority (EBA) published the results of its second round of bank stress tests. Market reactions on 18 July were muted, despite improvements in terms of quality, severity and cross-checking relative to last year's exercise. The EBA identified capital shortfalls in eight out of 90 major banks, and recommended capital raising for another 16 banks that had passed the test within 1 percentage point of the 5% core Tier 1 capital threshold.[3] The broad market impact of the release was limited but indicated somewhat greater differentiation across banks. CDS spreads edged up for Greek and Spanish banks, and eased for Irish and Portuguese banks. Analysts focused on the disclosures of sovereign exposures accompanying the official results to run their own sovereign default scenarios. In most cases, these suggested that market-implied haircuts on peripheral European debt would cut capital ratios, but to manageable levels.

Investors sell off bank exposures …

However, fears that serious debt strains would spill over to Italy and Spain led to a broad-based sell-off of bank stocks and bonds. Selling pressure went from banks in Italy and Spain to those in Belgium and France, and later extended to banks across the entire continent, including those headquartered in the Nordic countries. Bank equity valuations plunged as asset managers reportedly lowered their overall allocations to bank equity as an asset class. This caused bank equity to sharply underperform an already declining broader market, and drove up CDS spreads across the banking industry (Graph 7, left-hand panel).

By early September, bank valuations had tested new depths on both sides of the Atlantic. In the United States, new lawsuits over subprime mortgages compounded the pressure on bank equity resulting from negative growth revisions. The market's outlook on the banking industry as a whole remained clouded by growth concerns and sovereign risk as well as low interest rates and regulatory changes, a combination that left investors unsettled about the industry's future course and earnings potential.

… compounding bank funding challenges

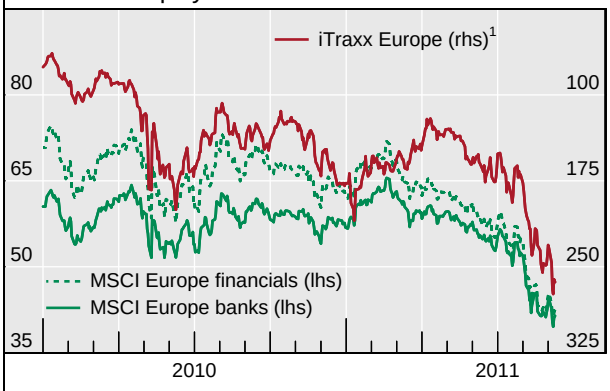
These developments went hand in hand with tensions in bank funding markets. The senior unsecured term funding segment had been difficult to access for some time, but issuance declined further in July and August. Euro area banks' bond issuance fell sharply, to $20 billion in July, along with a shortening of maturities (Graph 7, right-hand panel). Many European banks

[2] See the special feature by Michael Davies and Timothy Ng in this issue of the *BIS Quarterly Review*.

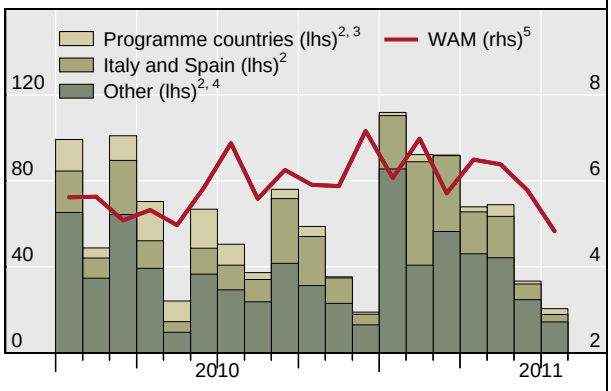
[3] Most banks that narrowly passed last year's European bank stress test have sought recapitalisations since.

Spillover to European banks

CDS and equity indices



Bank bond issuance



[1] Europe five-year senior financial CDS index, inverted scale, in basis points. [2] Syndicated domestic and international gross issuance of bonds of maturities of one year or more, issued by banks headquartered in the euro area, immediate issuer basis, in billions of US dollars. Preliminary data for August 2011 (not shown) indicate low issuance, mostly in collateralised instruments. [3] Banks headquartered in Greece, Ireland and Portugal. [4] Banks headquartered in other euro area countries (excluding Italy, Spain and the programme countries). [5] Weighted average maturity of fixed rate issuance, in years.

Sources: Bloomberg; Datastream; Dealogic; BIS calculations. Graph 7

faced difficulties in raising long-term funding in the past few months, and market participants became increasingly concerned about prohibitive pricing. US money market mutual funds (MMMFs), traditionally an important funding source, substantially reduced their banking exposures, especially those vis-à-vis European banks. Fitch Ratings reports that the 10 largest prime MMMFs cut back their European bank holdings by 20% (approximately $79 billion) between end-May and end-July, and by 97% vis-à-vis banks from Italy and Spain, to protect themselves against banks facing writedowns on their holdings of debt issued by their home sovereign. On related concerns, several major French banks faced intense pressure and scrutiny over their short-term funding profile.

In the absence of market funding, banks headquartered in countries associated with sovereign debt problems continued to rely on Eurosystem liquidity to fund a significant share of their balance sheet. For Greek banks, central bank funding accounted for €96 billion (end-July) plus emergency liquidity; for Irish and Portuguese banks, the corresponding figures were €98 billion and €46 billion (August), respectively.[4] In July alone, banks in Italy doubled their borrowing from the Eurosystem to €80 billion (€85 billion in August). However, industry research indicates that most large European banks have already funded some 90% of their 2011 term funding targets and even prefunded for 2012.[5]

The rise in funding spreads reflects several factors

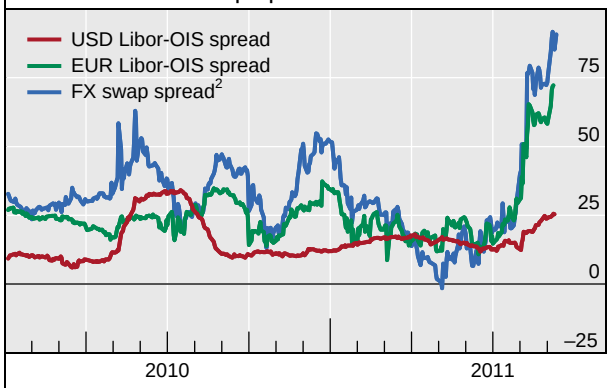
Bank funding spreads rose noticeably in August, but remained far below the levels reached in the aftermath of the Lehman Brothers bankruptcy. Some signs suggested that banks had grown more reluctant to lend to each other and had placed funds at the central bank instead. The use of the ECB's overnight

[4] See also Graph 2 in the special feature on sovereign risk in this *Quarterly Review*.

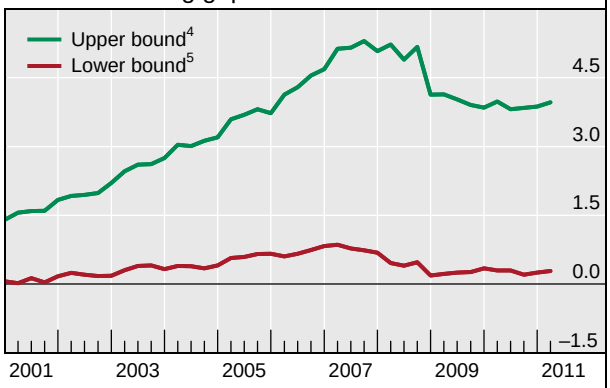
[5] Morgan Stanley Research, "European Banks: the stress in bank funding and policy options", 15 August 2011.

Spreads and dollar funding needs among European banks

Interbank and swap spreads[1]



US dollar funding gap estimates[3]



[1] In basis points. [2] Spread between three-month FX swap implied dollar rate and three-month US dollar Libor; the FX swap implied rate is the implied cost of raising US dollars via FX swaps using euros. [3] Estimates are constructed by aggregating the worldwide on-balance sheet cross-border and local positions reported by internationally active banks headquartered in Germany, the Netherlands, Switzerland and the United Kingdom, four major European banking systems with on-balance sheet US dollar assets exceeding their US dollar liabilities at the start of the crisis. Measures of US dollar funding gaps were developed in P McGuire and G von Peter, "The US dollar shortage in global banking and the international policy response", *BIS Working Papers*, no 291, 2009 and refined in I Fender and P McGuire, "European banks' US dollar funding pressures", *BIS Quarterly Review*, June 2010. [4] Gross US dollar positions vis-à-vis non-banks plus local positions vis-à-vis US residents (all sectors) booked by banks' offices in the United States, all assumed to be long-term and backed by short-term borrowing. [5] Gross positions, as defined above, minus liabilities vis-à-vis non-banks, assumed to be long-term.

Sources: Bloomberg; BIS consolidated banking statistics (immediate borrower basis); BIS locational statistics by nationality; BIS calculations. Graph 8

deposit facility reached a 12-month high of €145 billion on 8 August, and nearly €173 billion on 8 September. From early August, Libor-OIS spreads increased sharply; the three-month euro spread widened to 72 basis points, well beyond the dollar spread (Graph 8, left-hand panel).

At the same time, signs of renewed US dollar funding pressures resurfaced. FX swap spreads, which represent the premium paid by financial institutions for swapping euros into dollars, jumped to 92 basis points at a time when US money market mutual funds were reducing their exposure to European bank debt. By contrast, dollar Libor has risen only modestly since July. That said, Libor is calculated from quotes rather than from actual transactions, so there is no information on the volume of lending that takes place at this rate. Estimates of US dollar funding gaps among European banks suggest that funding needs remained sizeable, although they have come down substantially from their 2007–08 peaks (Graph 8, right-hand panel). Renewed dollar funding needs prompted the first uptakes in six months of US dollars at Swiss National Bank and ECB dollar auctions, on 11 and 17 August respectively. However, current swap spreads and the minimal use of international dollar swap lines remained far below the extremes witnessed in the autumn of 2008.

Safe haven assets in demand

Prices of safe haven assets rise as investors avoid risk ...

Fears of recession in some mature economies and serious strains in the euro area sovereign bond markets increased the demand for traditional safe haven assets. As a result, yields on some of the most highly rated and liquid

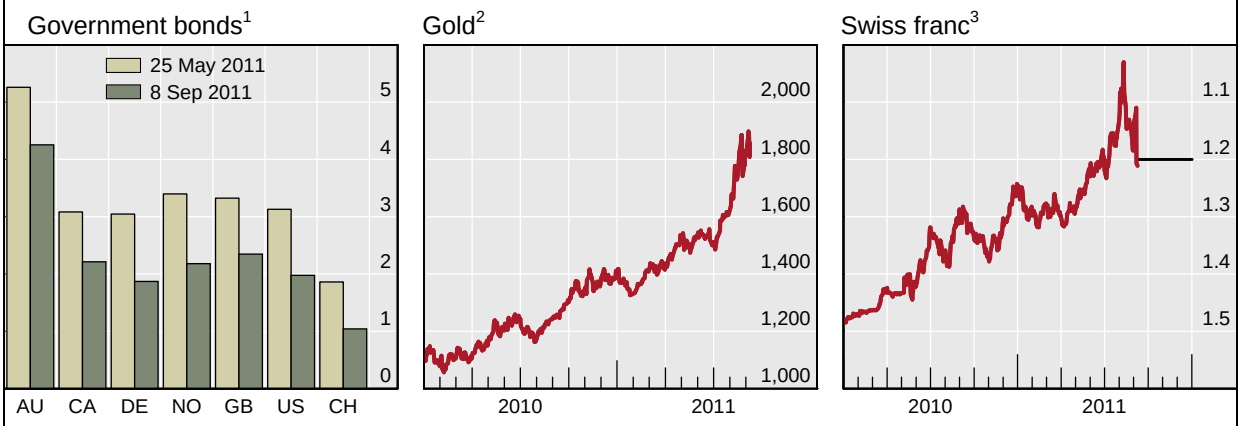
sovereign bonds fell markedly during the period under review (Graph 9, left-hand panel). Ten-year yields on US, German and Swiss government debt fell below 2%, while real interest rates on long-term US and UK inflation-linked bonds entered negative territory. Nominal yields on some short-dated US Treasury bills even fell below zero in early August, although this coincided with Bank of New York Mellon's announcement that it would begin charging fees on large deposits. Also, the price of gold set new historic records (Graph 9, centre panel) and the Swiss franc appreciated sharply as investors moved into Swiss assets (Graph 9, right-hand panel). These included Swiss government bonds, which had negative yields out to two-year maturities for much of August.

... causing some currencies to appreciate and authorities to intervene

The Swiss National Bank (SNB) reacted strongly to the appreciation of its currency. On 3 August, the SNB announced that it would cut its target interest rate to "as close to zero as possible". It also boosted the amount that it lends in the interbank market from CHF 30 billion to CHF 200 billion, reducing interbank borrowing rates at all maturities. This contributed to a decline in the value of the Swiss franc of over 10% against the euro. It began to appreciate again at the beginning of September, however, prompting the SNB to state on 6 September that: "With immediate effect, it will no longer tolerate a EUR/CHF exchange rate below the minimum rate of CHF 1.20. The SNB will enforce this minimum rate with the utmost determination and is prepared to buy foreign currency in unlimited quantities."

Other countries also introduced measures to counter upward pressure on the value of their currencies. In Japan, for example, the authorities sold yen in the foreign exchange markets from early August. After a short-lived depreciation of around 2%, the value of the yen stabilised against the dollar for the remainder of August and into September. And the Brazilian government introduced on 27 July a 1% transaction tax on onshore foreign exchange derivatives trades that result in US dollar short positions over $10 million. Since then, the Brazilian real has depreciated by around 5% against the dollar.

Prices of safe haven assets



AU = Australia; CA = Canada; CH = Switzerland; DE = Germany; GB = United Kingdom; NO = Norway; US = United States.

[1] Ten-year yields, in per cent. [2] In US dollars per troy ounce. [3] Against the euro. The horizontal line shows the maximum value of the Swiss currency that the Swiss National Bank will "tolerate" as of 6 September 2011.

Sources: Bloomberg; Datastream; BIS calculations. Graph 9

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Highlights of the BIS international statistics

The BIS, in cooperation with central banks and monetary authorities worldwide, compiles and disseminates several datasets on activity in international banking and financial markets. The latest available data on the international banking market refer to the first quarter of 2011. The discussion of international debt securities and exchange-traded derivatives draws on data for the second quarter of 2011. The first of three boxes in this chapter discusses the relationship between the category "guarantees extended" in the BIS consolidated banking statistics and the amount of CDS sold by BIS reporting banks. The second analyses the use of covenants as a measure of risk-taking in the syndicated loan market. The third focuses on the collateralisation of counterparty credit risk in the OTC derivatives market.

The international banking market in the first quarter of 2011[1]

The aggregate cross-border claims of BIS reporting banks rose during the *first quarter of 2011*, mainly as a result of a significant increase in lending to residents of the United States. At the same time, cross-border claims on residents of emerging market economies went up for the eighth quarter in a row. By contrast, aggregate exchange rate-adjusted foreign claims on the euro zone fell by $51 billion (0.7%). As of March 2011, euro area banks had a much lower share of their total foreign claims exposed to the US public sector than did their peers from the rest of the world. The opposite was true for foreign claims on the public sectors of Greece, Ireland, Italy, Portugal and Spain.

Aggregate cross-border claims expand[2]

The aggregate cross-border claims of BIS reporting banks rose during the first quarter of 2011 (Graph 1, left-hand panel). The $491 billion (1.6%) expansion was roughly evenly split between increases in interbank claims ($254 billion or 1.3%) and lending to non-banks ($237 billion or 2.2%).

Cross-border claims on the United States expand

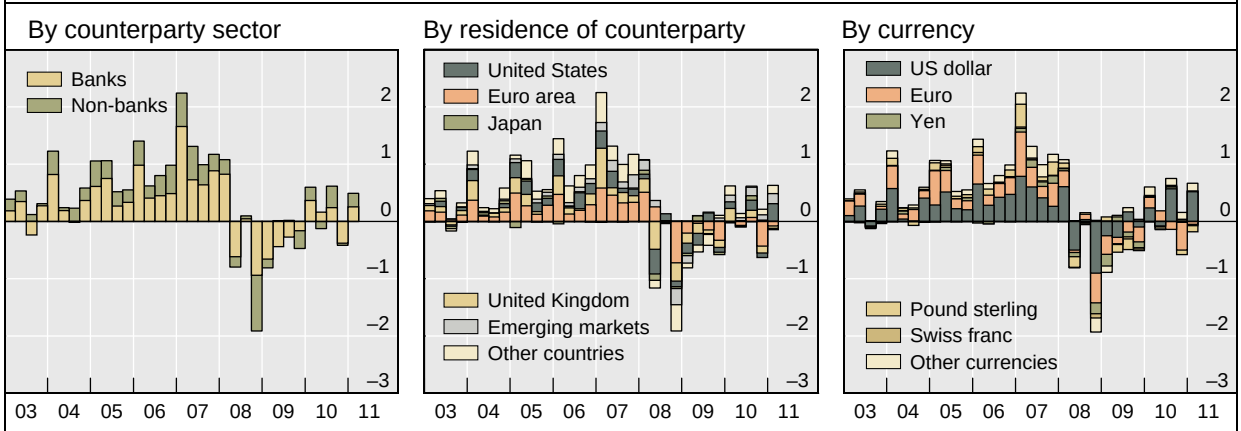
Cross-border lending to the United States grew the most (Graph 1, centre panel). In absolute terms, the $309 billion (5.9%) expansion in claims on

[1] Queries concerning the banking statistics should be addressed to Stefan Avdjiev.

[2] The analysis in this and the following subsection is based on the BIS locational banking statistics by residence. In this dataset, 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 fluctuation and breaks in series.

Changes in gross cross-border claims[1]

In trillions of US dollars



[1] BIS reporting banks' cross-border claims include inter-office claims.

Source: BIS locational banking statistics by residence. Graph 1

residents of the country was the largest on record. By contrast, BIS reporting banks reduced their claims on the euro area (by $78 billion or 0.8%) and the United Kingdom (by $43 billion or 0.9%). Nevertheless, both of these declines were significantly smaller than the respective ones in the previous quarter. At the same time, claims on Japan contracted for the first time in a year (by $20 billion or 2.5%) against the backdrop of the powerful earthquake and tsunami that hit the country in March.

The overall rise in cross-border claims during the quarter was led by a substantial increase in US dollar lending (Graph 1, right-hand panel). Claims in that currency expanded by $521 billion (4.2%), bringing the overall increase in US dollar-denominated cross-border claims between June 2010 and March 2011 to $1.1 trillion (9.0%). Approximately 60% ($315 billion) of the increase in US dollar lending during the first quarter of 2011 was directed towards US residents, while close to 11% ($56 billion) went to emerging market economies. By contrast, cross-border claims denominated in sterling (–$103 billion or –6.7%), euros (–$52 billion or –0.5%) and yen (–$23 billion or –1.9%) all fell during the quarter.

Cross-border claims on emerging markets surge

BIS reporting banks increased their cross-border claims on residents of emerging market economies for the eighth consecutive quarter. The $178 billion (6.3%) expansion was the largest since the fourth quarter of 2007. It was the result of a $147 billion (10%) rise in interbank claims and a $31 billion (2.3%) increase in claims on non-banks. Cross-border claims went up in all four major developing regions.

Lending to Asia-Pacific …

Cross-border claims on Asia-Pacific continued to grow at a very rapid pace (Graph 2, top left-hand panel). Almost two thirds of the unprecedented $126 billion (12%) increase in lending to the region was due to an $80 billion (24%) surge in claims on China. Banks also reported significant increases in their claims on Malaysia ($11 billion or 25%), India ($9.3 billion or 5.0%) and Korea ($8.8 billion or 4.5%).

... and to Latin America and the Caribbean continues to grow

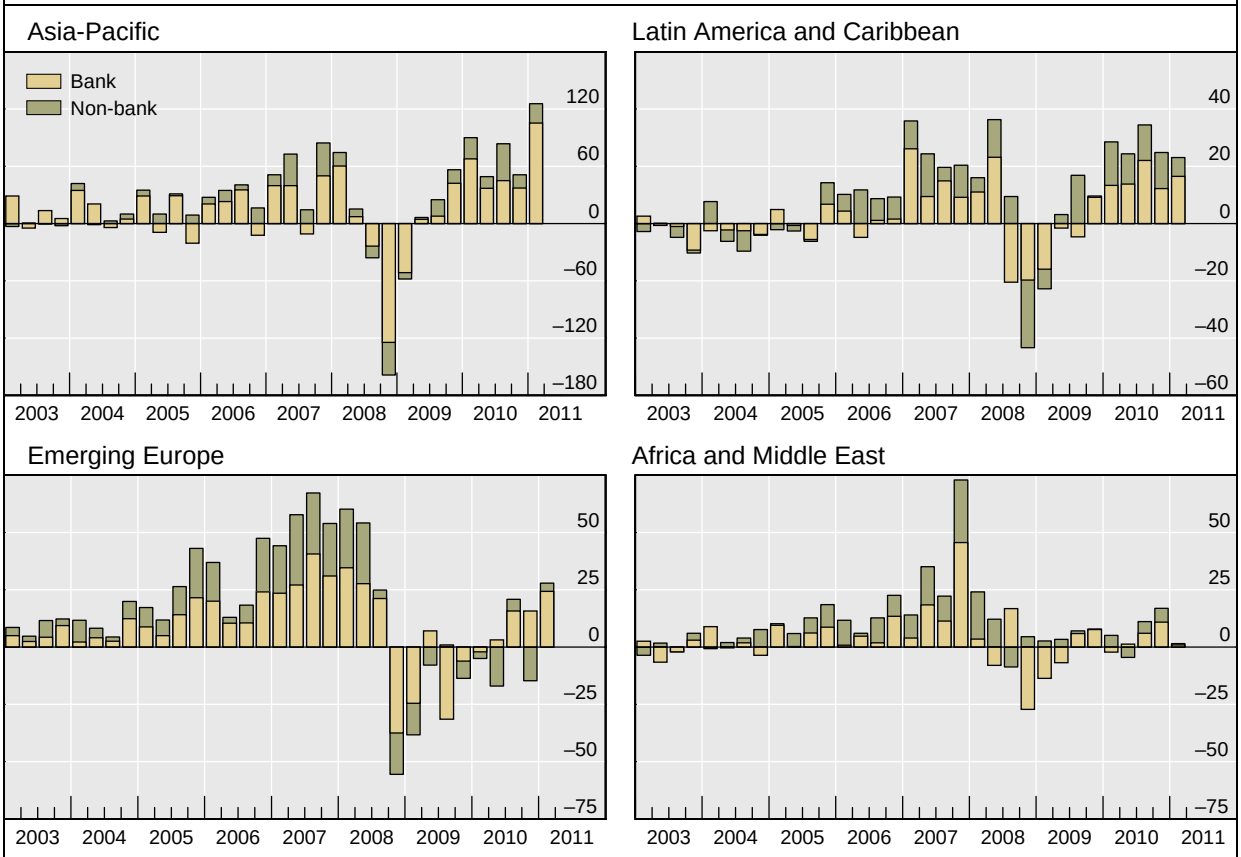
Cross-border claims on residents of Latin America and the Caribbean continued to expand (Graph 2, top right-hand panel). More than half of the $23 billion (4.4%) rise in lending to the region was explained by the eighth consecutive increase in claims on Brazil ($13 billion or 5.3%). Claims on Mexico also rose significantly (by $4.3 billion or 3.8%). By contrast, claims on Uruguay declined by $1.8 billion (34%).

Lending to emerging Europe expanded during the first quarter of 2011 (Graph 2, bottom left-hand panel). The $28 billion (3.7%) overall increase was mainly driven by a $24 billion (6.1%) rise in interbank claims. Claims on residents of Poland increased by $13 billion (11%). Cross-border lending to residents of Turkey also grew considerably ($9.4 billion or 6.1%), despite the measures imposed by local policymakers in an effort to discourage further capital inflows and to slow down credit growth. Claims on Hungary (+$3.1 billion or +4.2%), Russia (+$2.0 billion or +1.4%) and Croatia (+$1.9 billion or +4.7%) also increased noticeably.

Cross-border claims on residents of Africa and the Middle East also recorded an expansion, albeit a much more modest one than those in the other three emerging market regions (Graph 2, bottom right-hand panel). Against the backdrop of the sociopolitical turmoil that engulfed a large part of the region during the first quarter of 2011, overall cross-border lending increased slightly

Changes in cross-border claims on residents of emerging markets[1]

By counterparty sector, in billions of US dollars



[1] BIS reporting banks' cross-border claims (including inter-office claims) in all currencies.

Source: BIS locational banking statistics by residence. Graph 2

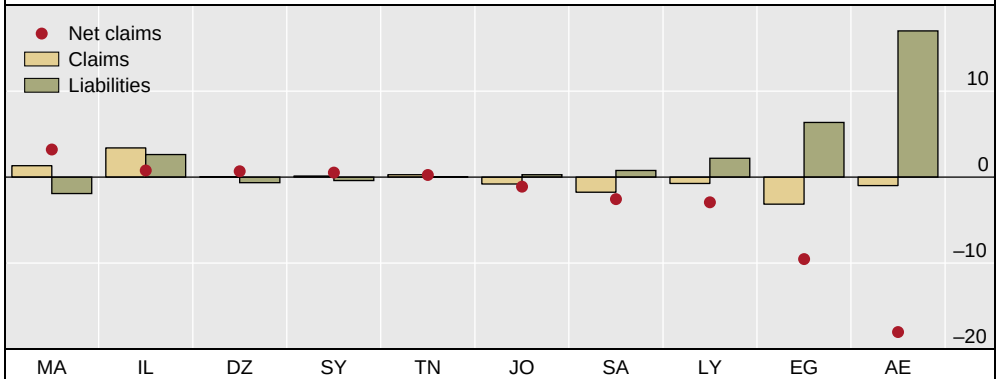
(by $1.5 billion or 0.3%). The relatively modest aggregate change in claims masks significant variation at the country level (Graph 3, brown bars). For example, claims on Egypt, which was shaken by a popular uprising that resulted in a regime change, shrank by $3.2 billion (14%). Similarly, claims on Libya, where a civil war erupted during the same period, contracted by $0.7 billion (37%). Considerable declines were also seen in lending to Saudi Arabia ($1.8 billion or 2.0%), the United Arab Emirates ($1.0 billion or 1.0%) and Jordan ($0.8 billion or 17%). By contrast, internationally active banks reported substantial increases in their claims on Israel ($3.4 billion or 17%) and Morocco ($1.3 billion or 14%). Claims on Tunisia, which was the first country in the region to go through mass protests and a change in political leadership, also increased (by $0.3 billion or 7.1%).

There were several noteworthy developments in the flow of liabilities of BIS reporting banks to residents of the Middle East and North Africa (Graph 3, green bars). Internationally active banks reported the largest single-quarter increase in liabilities to residents of Egypt ($6.4 billion or 26%). Liabilities to residents of Libya also increased considerably (by $2.2 billion or 3.7%). These developments most likely reflected domestic funds being moved out of the two countries as a result of the elevated levels of political and economic uncertainty.[3] Meanwhile, against the backdrop of rapidly growing oil prices, banks reported a surge in liabilities to residents of the United Arab Emirates ($17 billion or 23%). The rise was the largest since the fourth quarter of 2007. Liabilities to residents of Saudi Arabia also rose, but by a much more modest amount ($0.8 billion or 0.5%).

Changes in cross-border positions[1]

Q1 2011, in billions of US dollars

Selected countries in the Middle East and North Africa



AE = United Arab Emirates; DZ = Algeria; EG = Egypt; IL = Israel; JO = Jordan; LY = Libya; MA = Morocco; SA = Saudi Arabia; SY = Syria; TN = Tunisia.

[1] BIS reporting banks' cross-border positions (including inter-office positions) vis-à-vis all sectors. Net claims are defined as claims minus liabilities.

Source: BIS locational banking statistics by residence. Graph 3

[3] The financial sanctions that many countries imposed on Libya in the first quarter of 2011 may have also affected the flow of liabilities of BIS reporting banks to residents of the country.

Foreign claims on the euro area decline on an exchange rate-adjusted basis[4]

Exchange rate-adjusted foreign claims on the euro area decline

BIS reporting banks' total *consolidated* foreign claims[5] on residents of the euro area stood at $7,979 billion as of the end of the first quarter of 2011. According to our estimates, at constant exchange rates,[6] aggregate foreign claims on the euro zone fell by $51 billion (0.7%) during the first quarter of 2011.[7] The overall decline was primarily caused by a $69 billion (3.1%) contraction in interbank claims (Graph 4). By contrast, claims on the public sector rose (by $21 billion or 1.4%), while those on the non-bank private sector remained virtually unchanged. All of these changes were fairly modest in magnitude relative to the average historical variability of each of the series.

Among individual countries, exchange rate-adjusted foreign claims on France fell the most. The overall reduction ($33 billion or 2.7%) was led by a $31 billion (5.0%) decrease in interbank claims. Foreign claims on the country's public and non-bank private sectors also declined slightly (by $1.0 billion or 0.5% and by $0.5 billion or 0.1%, respectively). Foreign claims on Germany also contracted during the first quarter of 2011. Just as in the case of France, the overall decline ($15 billion or 0.9%) was led by a $29 billion (5.4%) reduction in interbank claims. Foreign claims on the German non-bank private sector also fell, but by a much smaller amount ($0.5 billion or 0.1%). In contrast, claims on the country's public sector rose by $15 billion (3.1%) during the quarter.

Foreign claims on Spain, Ireland and Greece also shrank during the first quarter of 2011. The overall contractions in claims on Spain and Ireland ($24 billion or 3.4% and $17 billion or 3.7%, respectively) were led by declines in interbank claims ($23 billion or 10% and $11 billion or 13%, respectively). By contrast, the $7.7 billion (5.6%) reduction in foreign claims on Greece was primarily caused by falls in claims on the country's public and non-bank private sectors ($4.1 billion or 8.8% and $3.2 billion or 3.9%, respectively).

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[4] The analysis in this and the following subsection is based on the BIS consolidated international banking statistics on an ultimate risk basis. In this dataset, 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 (see the box on pages 16–17 in the March 2011 *BIS Quarterly Review* for a more detailed discussion and examples of risk transfers).

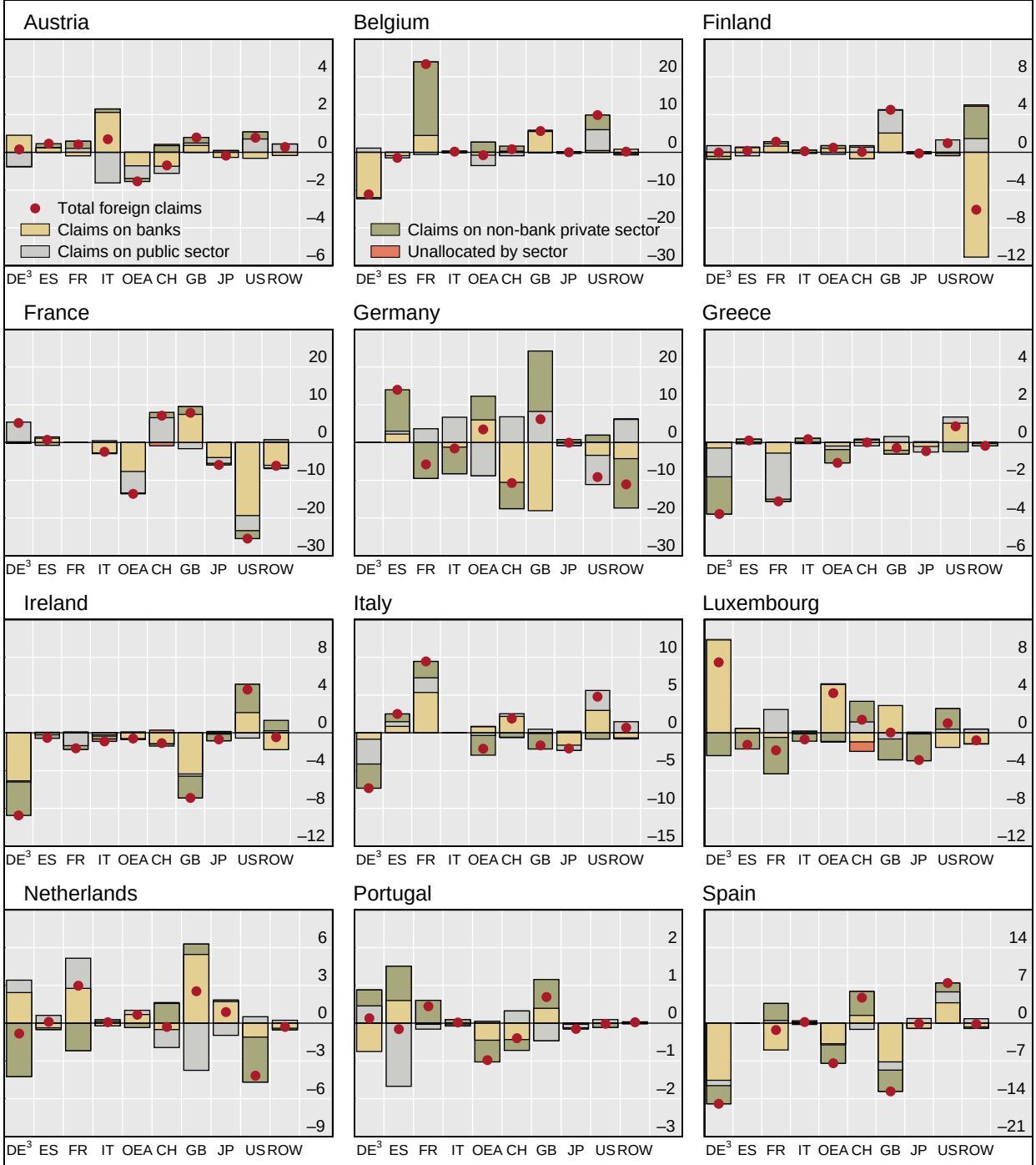
[5] *Foreign claims* consist of cross-border claims (ie claims on entities located in a country other than the country of residence of the reporting banking office) and local claims (ie claims on entities located in the country of residence of the reporting banking office) of foreign affiliates (ie branches and subsidiaries located outside the country in which the reporting bank is headquartered). Foreign claims do *not* include foreign currency claims on residents of the country in which the reporting bank is headquartered.

[6] In order to adjust for the currency fluctuations that took place during the period, we make the (admittedly imperfect) assumption that all foreign claims on residents of the euro area are denominated in euros.

[7] All flow figures have been adjusted for breaks in series.

Estimated changes in foreign claims[1] on selected countries, Q1 2011

By bank nationality at constant end-Q1 2011 exchange rates,[2] in billions of US dollars



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.

[1] Foreign claims consist of cross-border claims and local claims of foreign affiliates. Claims of banks headquartered in the respective country are not included, as these are not foreign claims. [2] All claims are assumed to be denominated in euros. [3] Claims of German banks are on an immediate borrower basis, except claims on the Greek public sector, which are on an ultimate risk basis.

Source: BIS consolidated banking statistics (ultimate risk basis). Graph 4

BIS reporting banks' foreign claims on the public sectors of the GIIPS countries and the United States

The latest fiscal developments in a number of euro area economies (Greece, Ireland, Italy, Portugal and Spain – "GIIPS" hereafter) and in the United States have generated interest in the shares of major banking systems' foreign portfolios that are invested in the public sectors of those countries. The BIS consolidated banking statistics on an ultimate risk basis allow us to quantify those shares (Graph 5, top panel) and to track their evolution over the past several years (Graph 5, bottom four panels). Several facts stand out.

The foreign public sector allocations of euro area banks differ significantly from those of banks from the rest of the world

First, as of the end of the first quarter of 2011, there was a strong geographical pattern in BIS reporting banks' relative holdings of claims on the public sectors of the GIIPS countries and the United States (Graph 5, top panel). Namely, the banking systems with the highest shares of foreign claims on the GIIPS public sectors were all from the euro area (Belgium, France, Germany and Ireland). Conversely, the banking systems whose foreign portfolios were most heavily biased towards the US public sector were all from outside the euro area (Canada, Japan, Switzerland and the United Kingdom). The fact that euro area banks have a tendency to hold more of the public sector debt of the GIIPS countries than banks from the rest of the world is not surprising. It could be explained by a variety of factors such as currency risk considerations, institutional arrangements, regulatory requirements and informational asymmetries. What is more surprising is that euro zone banks tend to hold substantially smaller shares of foreign claims on the US public sector than their peers from the rest of the world.

Second, there were no major banking systems that had substantial portions of their foreign portfolios invested in both the US public sector and the public sectors of the GIIPS countries (ie there were no banking systems in the top-right quadrant of the top panel of Graph 5). For example, Belgian, French and German banks had relatively high shares of foreign claims on the public sectors of the GIIPS countries (6.6%, 5.0% and 3.4%, respectively) but were significantly less exposed to the US public sector (3.3%, 2.9% and 0.8%, respectively). Conversely, even though the weights of the US public sector in the foreign portfolios of Canadian and Japanese banks were fairly high (20% and 15%, respectively), these two banking systems had very little exposure to the public sectors of the GIIPS countries (0.7% and 1.6%, respectively). Swiss banks and UK banks were in similar situations.

Third, the evolution of the shares of BIS reporting banks' foreign portfolios dedicated to the public sectors of the United States and the GIIPS countries over the past four years can be split into two periods (Graph 5, middle left-hand panel). During the first one, which begins with the onset of the global financial crisis in the third quarter of 2007 and lasts until the third quarter of 2009, internationally active banks increased the shares of claims on the public

Box 1: Exploring the relationship between "guarantees extended" and CDS sold

Stefan Avdjiev

Recently, there has been a substantial amount of interest in the extent to which the category "guarantees extended"[1] of the BIS consolidated banking statistics on an ultimate risk basis could be used as a proxy for the *credit default swap (CDS) exposures* of various banking systems to individual countries. Several important caveats apply to such an approximation.

First, while the contingent liabilities of the protection seller of credit derivatives contracts are a part of the category "guarantees extended", they are not the only item included in it. In addition to CDS contracts sold by BIS reporting banks, this category also includes secured, bid and performance bonds, warranties and indemnities, confirmed documentary credits, irrevocable and standby letters of credit, acceptances and endorsements. Therefore, the fact that US banks, for instance, had $37 billion worth of guarantees exposures to Greece as of the end of Q1 2011 (Table 9E in the BIS Statistical Annex) does not imply that US banks had sold $37 billion worth of CDS protection on entities located in Greece.

Second, banks are not the only institutions that buy and sell CDS contracts. Other financial enterprises, such as insurance companies and hedge funds, also actively participate in the CDS market. As a result, not all CDS written on entities located in a given country are included in the category "guarantees extended" of the BIS consolidated banking statistics. Thus, US banks' $37 billion worth of guarantees exposures to Greece from the above example is not the correct ceiling on the total amount of CDS written on Greek entities by US institutions.

Third, in the category "guarantees extended" of the BIS consolidated banking statistics, CDS sold are reported at *notional* values, not at fair values. In order to illustrate that point, suppose that a French bank sells a CDS to a Spanish bank on $1 billion worth of securities issued by the Greek government. Suppose further that, at the time of reporting, the CDS has a positive fair value of $100 million from the seller's perspective (ie the French bank). According to the *Guide to the BIS consolidated banking statistics*, the French bank should report $1 billion (ie the *notional* amount of CDS sold) worth of "guarantees extended" to Greece.

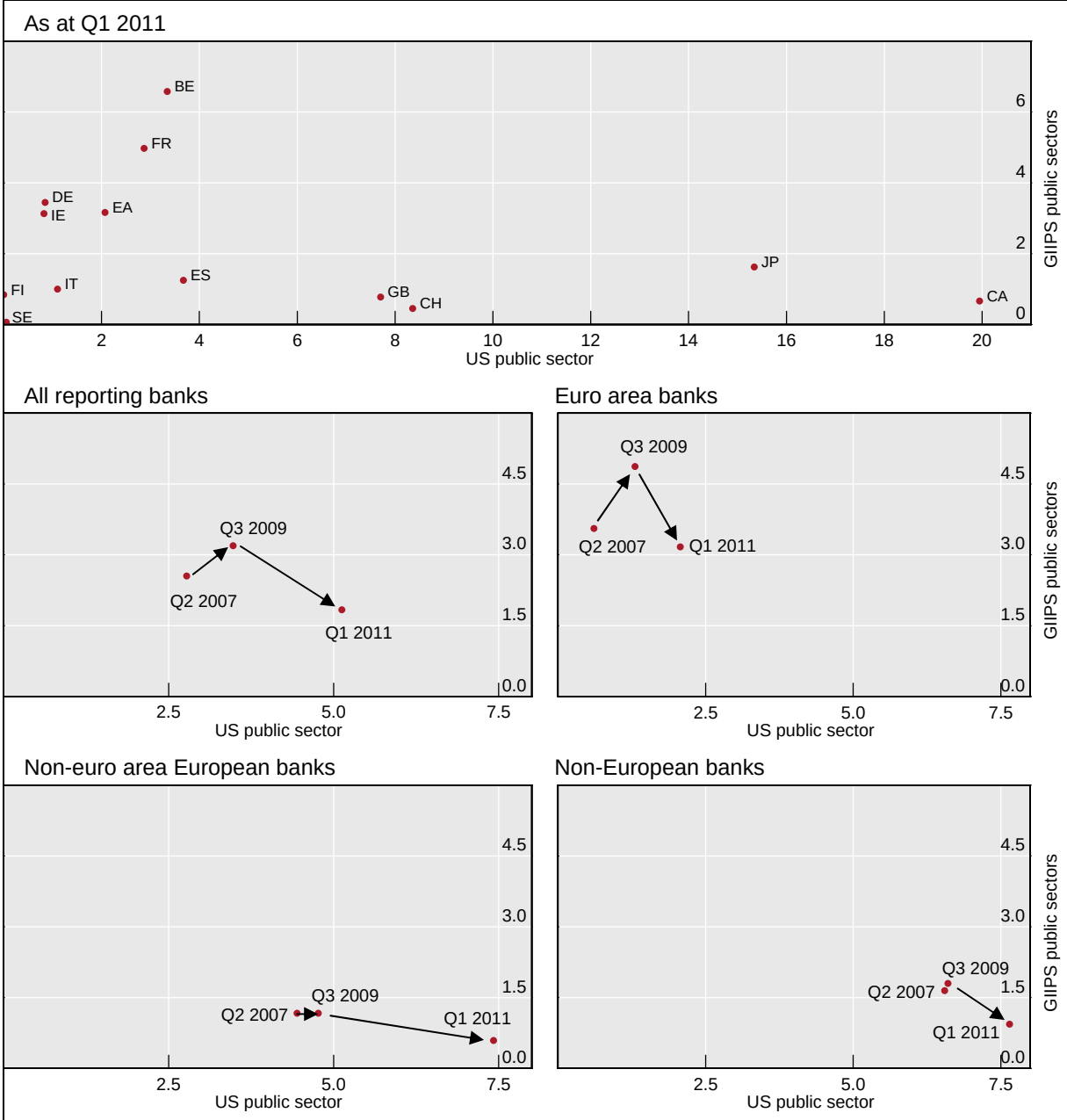
Fourth, in the category "guarantees extended" of the BIS consolidated banking statistics, CDS sold are generally reported at *gross (not net)* values. To illustrate this, suppose that the French bank from the above example sells a CDS to a Spanish bank on $1 billion worth of securities issued by the Greek government and simultaneously buys a CDS on the same set of securities from an Italian bank. If these were the only two transactions the French bank engaged in during the period, it would report $1 billion (ie the *gross* notional amount of CDS sold) worth of "guarantees extended" to Greece, despite the fact that it has also bought a CDS on the same contract from a third party (in this example, from the Italian bank).

Finally, CDS bought by banks are *not* reported in the category "guarantees extended". Their treatment in the BIS consolidated banking statistics depends on whether the reporting bank that purchased the CDS contract owns the underlying security or not. Suppose that the CDS contract that the French bank bought from the Italian bank in the above example has a positive fair value of $100 million from the buyer's perspective (ie from the perspective of the French bank). If the French bank does not own the underlying security, it should report $100 million (ie the *positive fair value* of CDS bought) worth of "derivatives" exposures to Italy. If, on the other hand, the French bank owns the underlying security, it should report a risk transfer of $1 billion out of the Greek public sector into the Italian banking sector (ie on an immediate borrower basis, the French bank will report $1 billion worth of foreign claims on the Greek public sector; on an ultimate risk basis, it will report $1 billion worth of foreign claims on the Italian banking sector).

[1] The *Guide to the BIS consolidated banking statistics* defines guarantees as "contingent liabilities arising from an irrevocable obligation to pay a third-party beneficiary when a client fails to perform some contractual obligation".

Consolidated foreign claims on the public sectors of the GIIPS[1] countries and the US

By bank nationality, as a percentage of banks' total foreign claims



BE = Belgium; CA = Canada; CH = Switzerland; DE = Germany; EA = euro area; ES = Spain; FI = Finland; FR = France; GB = United Kingdom; IE = Ireland; IT = Italy; JP = Japan; SE = Sweden; US = United States.

[1] GIIPS = Greece, Ireland, Italy, Portugal, Spain. Claims of banks headquartered in Ireland, Italy and Spain on their respective home country's public sector are not included, as these are not foreign claims.

Source: BIS consolidated banking statistics (ultimate risk basis). Graph 5

sectors of both the United States and the GIIPS countries in their foreign portfolios (from 2.5% to 3.2% and from 2.8% to 3.5%, respectively).[8] These increases were part of a global rebalancing of BIS reporting banks' foreign

[8] Even though some of the above changes may partially reflect exchange rate fluctuations that took place during the period, our estimates indicate, on a wide range of assumptions, that these were not the main drivers of the above movements.

portfolios towards the public sector. The share of those claims in aggregate foreign claims increased from 14.5% to 18.5% during the same period. The second period begins in the fourth quarter of 2009, when the first more serious signs of fiscal problems in the euro zone began to emerge, and ends in the first quarter of 2011, which is the quarter to which the latest available data refer. During that period, the share of the US public sector continued to increase (from 3.5% to 5.1%), while that of the GIIPS public sectors shrank to a level that was much lower than at the start of the financial crisis (from 3.2% to 1.8%). During the same time, the global share of foreign claims on the public sector increased again, but by much less than during the first period (from 18.5% to 19.8%).

Fourth, euro area banks entered the financial crisis with very different foreign public sector allocations than banks from the rest of the world. In the middle of 2007, euro zone banks had 3.6% of their total foreign claims invested in the public sectors of the GIIPS countries and only 0.6% in the US public sector (Graph 5, middle right-hand panel). By contrast, European banks from outside the euro area (Graph 5, bottom left-hand panel) and non-European banks (Graph 5, bottom right-hand panel) had allocated substantially lower shares to the public sectors of the GIIPS countries (1.2% and 1.7%, respectively) and significantly higher shares to the US public sector (4.4% and 6.6%, respectively).

Finally, the foreign public sector portfolios of euro area banks evolved in a different manner than those of their peers from the rest of the world in the first of the two periods discussed above, but moved in roughly the same direction during the second one (Graph 5, middle right-hand and bottom panels). Between the end of the second quarter of 2007 and the end of the third quarter of 2009, euro area banks considerably increased the weights of the public sectors of the GIIPS countries (from 3.6% to 4.9%) and the US public sector (from 0.6% to 1.3%) in their foreign portfolios. By contrast, the respective shares for European banks from outside the euro area and non-European banks changed very little during the same time. In the second period, all three groups reported sharp declines in the shares of the GIIPS public sectors and substantial increases in the shares of the US public sector in their respective foreign portfolios.

International debt securities issuance in the second quarter of 2011[9]

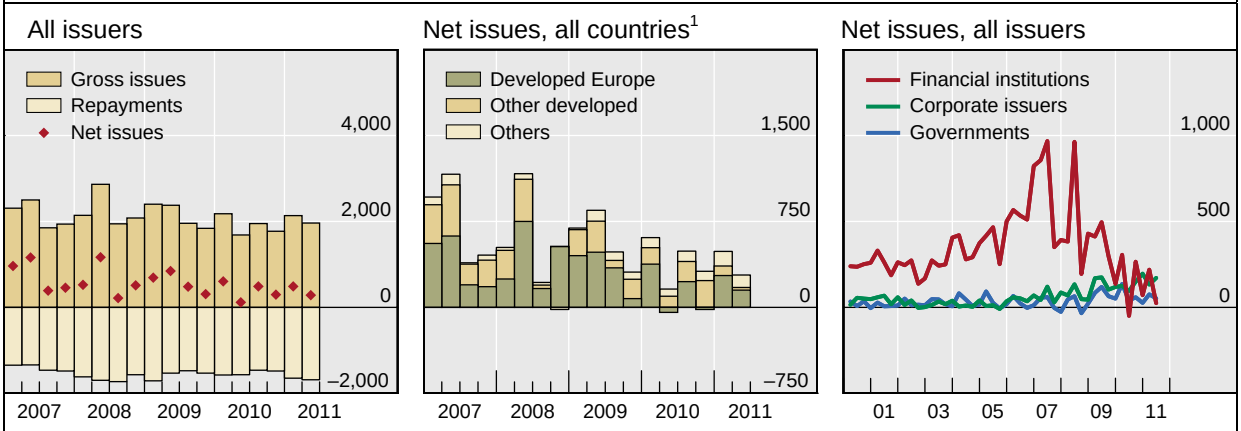
Declining issuance in the international debt securities market …

Activity in the primary market for international debt securities retreated in the *second quarter of 2011* (Graph 6, left-hand panel). Completed worldwide gross issuance stood at $1,965 billion, 8% lower than in the previous quarter. In combination with stable repayments, this resulted in a fall in net issuance to $283 billion, from $489 billion in the first quarter.

[9] Queries concerning international debt securities should be directed to Andreas Schrimpf.

International debt securities issuance

In billions of US dollars



[1] By nationality of issuer.

Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS. Graph 6

... driven mainly by lower US issuance

Low activity by borrowers of US nationality was the main driver behind the drop in global issuance. US borrowers raised a mere $1 billion via international debt securities during the second quarter of 2011, compared with an average of $142 billion per quarter over the period Q1 2004–Q1 2011.[10] Borrowers from other non-European developed markets sold international debt securities amounting to $22 billion (net). This contrasts with strong issuance by European entities, who tapped the market with $151 billion of net issues (just over half the world total). Emerging market issuers, international institutions and issuers from offshore centres raised $70 billion, $34 billion and $6 billion, respectively, on a net basis.

Issuance by non-financial corporates outstrips that by financials

Continuing a trend that started in late 2008, non-financial corporate issuance outstripped new borrowing by financial institutions. Non-financials raised $172 billion net of repayments, compared with financial issuance of $25 billion, the second lowest level since 2000. The low issuance by financial institutions was primarily the result of net repayments by US firms ($114 billion) and lower borrowing by European financial institutions ($81 billion, after $187 billion in the first quarter). In Europe, French financial institutions cut their issuance to $16 billion, down from $97 billion in the first quarter. Spanish financial institutions were also less active in the market, raising $11 billion in new issues compared with $47 billion in the first quarter. Borrowing by Dutch financial institutions remained strong, at $27 billion (Graph 7, left-hand panel). Financial institutions from Ireland and Austria actually paid back funds on a net basis, with respective repayments of $11 billion and $10 billion.

[10] Note, however, that the major market for US borrowers is the domestic debt securities market, which is quantitatively clearly more important than the international market segment discussed here. Aggregate issuance of US debt securities in the domestic market was still fairly robust in the first quarter of 2011 (the latest available figure in the BIS domestic debt securities data) and was mostly driven by the government and the corporate sector (see changes in stocks, Tables 16A and 16B in the Statistical Annex).

Box 2: Have lenders become complacent in the market for syndicated loans? Evidence from covenants

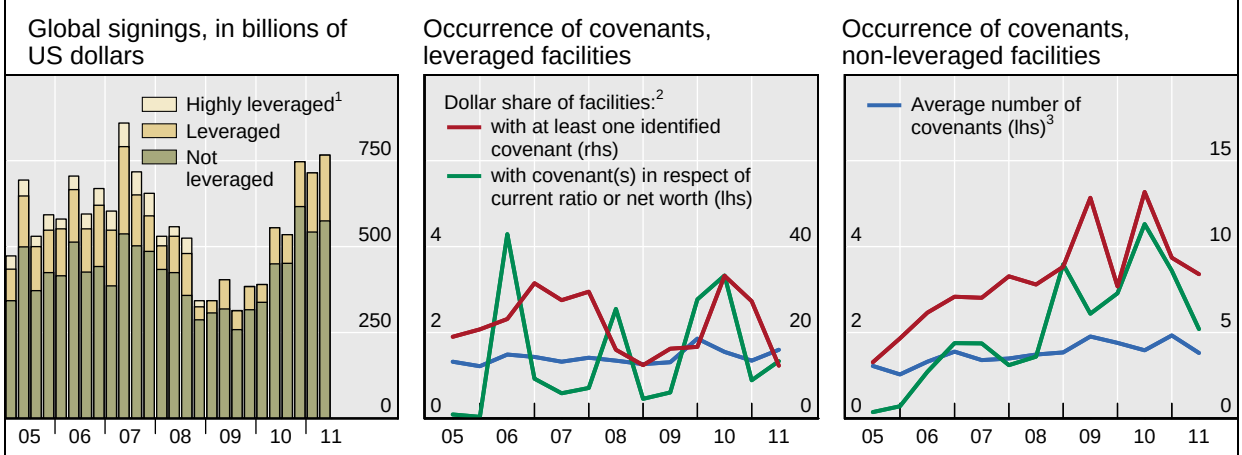
Blaise Gadanecz

The market for syndicated loans, a very significant source of funding for corporate borrowers, has recovered from its collapse during the financial crisis. By early 2011, financing was available at close to pre-crisis conditions.

Syndicated loan signing volumes bounced back from the nadir reached in the aftermath of the crisis, rising from $314 billion in the third quarter of 2009 to $766 billion in the second quarter of 2011 (Graph A, left-hand panel). Refinancings generated $405 billion of signings in the second quarter of 2011, or 53% of the total, as borrowers sought to replace facilities obtained during the crisis at less attractive conditions. Issuance of leveraged loans,[①] which had dropped sharply, has also rebounded. A number of large banks have resumed lending, as emergency liquidity and rescue operations helped alleviate funding constraints and shore up bank balance sheets. Activity on secondary markets also revived, suggesting that investors are willing to absorb larger amounts of loan exposure.

Syndicated lending, 2005–11

Signings and occurrence of covenants



[1] Dealogic Loan Analytics does not distinguish between highly leveraged and leveraged for loans signed after 2008. From 2009 onwards, only leveraged versus non-leveraged status is reported. The highly leveraged category used to apply to facilities carrying spreads above a certain benchmark. [2] In per cent. [3] Weighted by facility sizes; only for facilities with at least one covenant.

Source: Dealogic Loan Analytics. Graph A

A number of measures indicate that financing conditions in the syndicated loan market have become looser since 2009 and are now comparable to or more favourable than the pre-crisis terms observed from the early 2000s.

First, spreads over Libor have declined, average maturities have lengthened and facility sizes have increased. The dollar share of collateralised tranches has also fallen slightly. Leveraged borrowers worldwide paid an average spread (weighted by tranche sizes) over Libor of 339 basis points in the second quarter of 2011, non-leveraged borrowers 144 basis points. That is still 100–150 basis points above the extraordinarily low pre-crisis levels, but only about half as high as the peaks reached during the crisis. These trends can be consistently observed for a number of different leverage classes, currencies, ratings classes and regions.

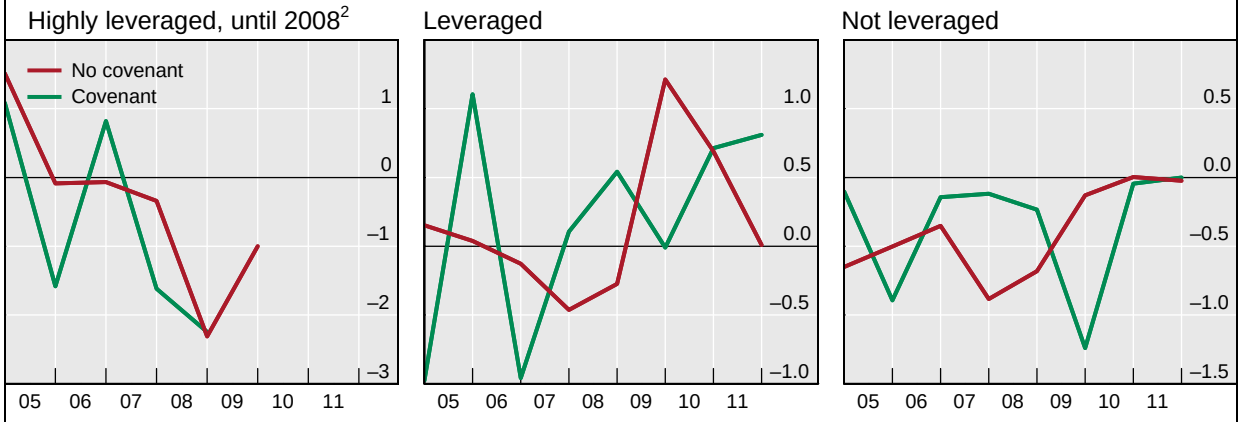
Second, "covenant-lite" loans have accounted for an increasing share of signings. Covenants are contract clauses that entitle lenders to impose penalties (eg a surcharge in the spread) or to accelerate the repayment of the loan if the borrower undertakes actions that might diminish the value of the collateral (such as selling or transferring assets), or fails to keep commitments (such as paying on time or keeping certain financial ratios above a given threshold). In a covenant-lite facility, the lender waives these clauses, thus enjoying less protection if the borrower meets with financial difficulties. As covenants can take many forms, aggregating them into a single measure is difficult. Nonetheless, based on the literature, it is possible to construct a number of indicators for

covenant intensity: the share as a percentage of total dollar amounts of facilities with at least one identifiable covenant (Graph A, red lines in the centre and right-hand panels); the average number of different financial covenants per facility[②] (for those facilities which have at least one covenant, blue lines); and the dollar share of facilities with at least one covenant requiring the borrower's current ratio,[③] net worth or tangible net worth to remain above a certain threshold (green lines).[④] Admittedly, these indicators are rather noisy, showing large fluctuations within a year, particularly during crises when issuance is low. That said, all three indicators point to a drop in covenant usage in recent quarters, after an increase between 2008 and 2010 that followed a steady decline during the pre-crisis years. This has happened across regions and leverage classes.

Borrowers that were granted covenant-lite facilities during the height of the crisis have (for now) performed relatively well. Graph B shows better post-signing borrower ratings performance since 2009 for facilities without covenants (red lines) than for loans with covenants (green lines). Leveraged covenant-lites were associated with more borrower upgrades and non-leveraged covenant-lites with fewer downgrades. That said, this trend has recently started to reverse, which is reminiscent of the pre-crisis phase between 2000 and 2007–08 when covenant-lites exhibited a worse performance than facilities with covenants. While these comparisons need to be interpreted with caution, it is fair to conclude that, during crisis times, lenders are more likely to discriminate in favour of the better risks when waiving covenants. Besides, covenant-lite structures can help borrowers survive financial troubles, in that fewer defaults and penalties are mechanically triggered.

Post-signing ratings performance[1]

Average borrower ratings changes between signing date and present



[1] Average notch changes in the ratings of the borrower (weighted by tranche sizes) between the loan signing date and the current date. For instance, minus 2 means a two-notch average downgrade (e.g. from B+ to B–) between the time of signing and the current date. [2] See Graph A, footnote 1.

Sources: Dealogic Loan Analytics; author's calculations. Graph B

All in all, even as investor sentiment may have started turning in July–August, the above results suggest that financing conditions on the market for syndicated loans have loosened since the height of the crisis. For the United States, this is in keeping with the Federal Reserve Board's Senior Loan Officer Opinion Survey on Bank Lending Practices, which has indicated since 2009 that a falling net fraction of domestic banks is tightening standards or raising spreads on commercial and industrial loans.

[①] This box relies on the definition of Dealogic Loan Analytics for leveraged loans, which is revised annually. Over time the criteria have included borrower financial leverage and loan spreads above a certain threshold, ratings below a certain level, and loan purpose (in particular LBOs). Every loan is classified according to the definition which was valid when it was signed. It is not possible to reclassify earlier loans when the definition changes. [②] See M Puri and S Drucker, "On loan sales, loan contracting and lending relationships", *Review of Financial Studies*, vol 22, no 7, 2009 and N Mora, "Lender exposure and effort in the syndicated loan market", *Federal Reserve Bank of Kansas City Working Papers*, no RWP 10-12, September 2010. [③] Current assets divided by current liabilities. [④] S Chava and M Roberts, "How does financing impact investment? The role of debt covenants", *Journal of Finance*, vol 6, no 5, October 2008, give precedence to these two types of covenants over others, as they have the advantage that they are used relatively frequently and the associated accounting measures are standardised and unambiguous. Other types of covenants, such as those applied to EBITDA, are more complicated, notably because the definition of debt they refer to is not standardised.

Activity in the primary market for covered bonds weakened over the second quarter. At $14 billion, the estimated net issuance of covered bonds was about one third lower than in the previous quarter. Strong issuance by French and Swedish financial institutions ($12 billion and $9 billion, respectively) contrasted with continued repayments of Pfandbriefe by German banks ($29 billion). Likewise, Spanish banks made net repayments of cédulas worth $7 billion, in contrast to their strong issuance over the past two years.

Lower activity in the covered bond market

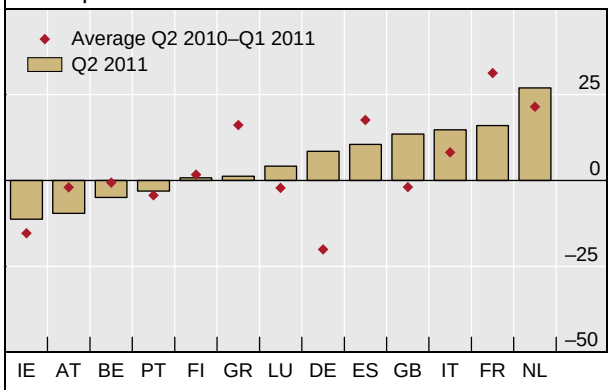
Non-financial corporations rated below investment grade took advantage of the declining spreads in the high-yield bond market segment and raised record amounts. Activity in this market segment was rather depressed during much of 2010 but soared from the beginning of 2011 (Graph 8, left-hand panel).[11] Net issuance of non-investment grade bonds was $73 billion in Q2 2011 and $63 billion in Q1 2011, compared with average net repayments of $4 billion per quarter in 2010. This strong issuance of high-yield debt securities and the tightening of spreads went hand in hand with a pickup in the syndicated loans market, another important funding source for corporate borrowers (see Box 2). Corporations headquartered in the United States accounted for the bulk of high-yield issuance ($56 billion in Q2 2011), followed by those from developed European economies ($14 billion). Issuance of high-yield debt securities slowed in June 2011 and continued to decline in July and August.

Record issuance of high-yield bonds in the first and second quarters

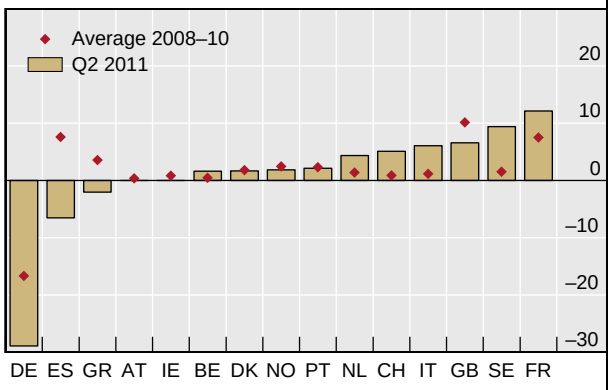
Debt securities issuance

In billions of US dollars

European financial institutions[1]



Covered bonds[2]



AT = Austria; BE = Belgium; DE = Germany; ES = Spain; FI = Finland; FR = France; GB = United Kingdom; GR = Greece; IE = Ireland; IT = Italy; LU = Luxembourg; NL = Netherlands; PT = Portugal.

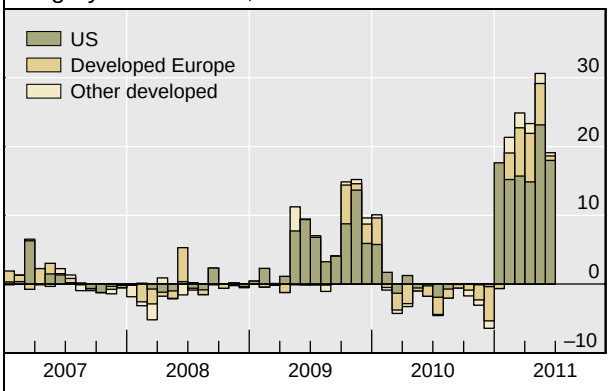
[1] Net issues, international debt securities, by nationality of issuer. [2] Net issues, placed on domestic and international markets, by nationality of issuer.

Sources: Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS. Graph 7

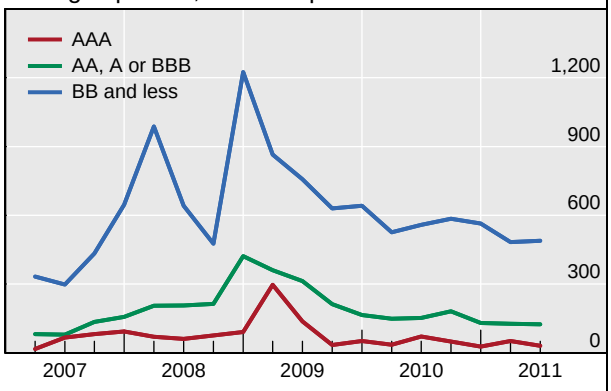
[11] While the decline in average high-yield bond spreads from their recent peaks in the fourth quarter of 2008 is substantial, average spreads in the primary market are still higher than their record pre-crisis lows in the second quarter of 2007 (Graph 8, right-hand panel). Furthermore, preliminary data in the first two months of the third quarter of 2011 suggest that spreads in the high-yield segment have widened again more recently.

International debt securities issuance

High-yield issuance,[1] in billions of US dollars



Average spreads,[2] in basis points



[1] Net issues by non-financial corporations, by nationality of issuer. [2] Weighted average, rating at issue. Announced issues by non-financial corporations headquartered in developed countries.

Sources: Dealogic; BIS. Graph 8

Exchange-traded derivatives in the second quarter of 2011[12]

Derivatives turnover and open interest fell slightly overall

The notional amount of interest rate, currency and equity index derivatives traded *in the second quarter of 2011* was slightly lower in dollar terms than in the first quarter. Trading volume fell by 3% overall, as turnover of interest rate futures (–1%) and options (–14%) declined, while that of currency (+5%) and equity index (+3%) derivatives increased. Outstanding positions also declined modestly during the quarter, by 2% overall. Turnover of commodity derivatives, measured by number of contracts, was broadly unchanged, while outstanding positions contracted by 3%.

Interest rate exposures rose for dollars but fell for other major currencies

Trading in interest rate derivatives in the second quarter may reflect reduced uncertainty about future interest rates for some of the major currencies. Turnover declined by 4% overall, reflecting falls in trading of futures and options linked to euro (–12%) and sterling (–28%) rates. Outstanding positions also declined in derivatives referencing euro (–20%) and sterling (–19%) rates, while those linked to US dollar rates increased by 13% (Graph 9, left-hand panel). This is consistent with declines in probabilities implied by the option prices of euro and, particularly, sterling rate increases during the quarter, as global inflation pressures eased. In contrast, few market participants attached significant probability to near-term changes in the US policy rate at any time during the quarter. Futures linked to yen interest rates also saw declines in trading volumes (–28%) and outstanding positions (–23%). This might reflect greater certainty that rates would remain low to support the Japanese economy following the March earthquake.

Trading of Brazilian real contracts boosted foreign exchange exposures

A significant portion of trading in currency derivatives may also have been driven by interest rate developments, via amendments to synthetic carry trade

[12] Queries concerning the exchange-traded derivatives statistics should be addressed to Nicholas Vause.

Box 3: Measuring counterparty credit exposures in the OTC derivatives market

Nicholas Vause

One key mechanism through which the failure of Lehman Brothers in September 2008 weakened the rest of the financial system involved potential counterparty credit exposures. Lenders withheld credit, fearing that borrowers might have significant claims on the investment bank that were not fully secure. Such claims could have arisen from bilateral derivatives trades in the over-the-counter (OTC) market, where total counterparty credit exposures vastly exceeded the total collateral posted by market participants. Since then, this gap has narrowed, reducing but perhaps not eliminating this particular systemic risk. This box discusses how to measure counterparty credit exposures across the OTC derivatives market. It does so based on the hypothetical positions in Table A.

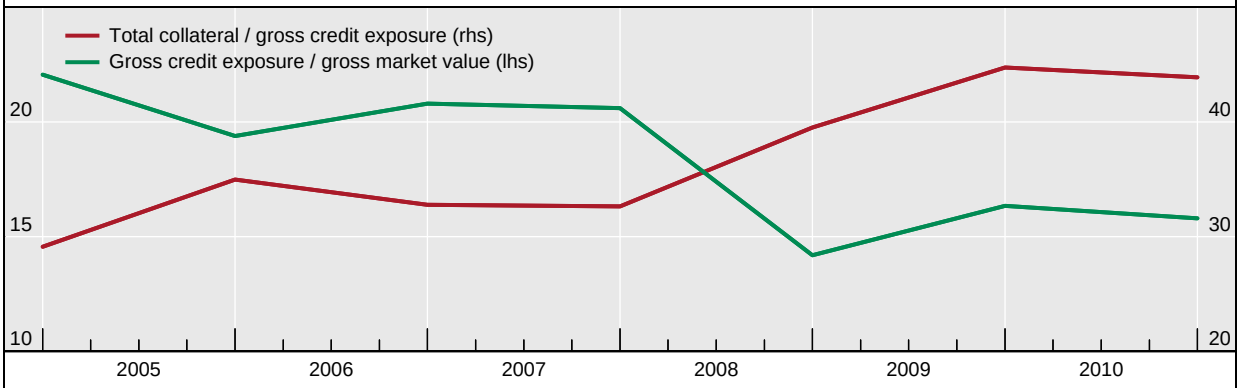
Hypothetical OTC derivatives positions

Party 1	Party 2	Positions	Market value		Gross market value	Gross credit exposure
			Party 1	Party 2		
Dealer A	Dealer B	FX option	–10	+10	13	7
		Gold future	+3	–3		
		Net bilateral position	–7	+7		
		Collateral received (+) / posted (–)	–7	+7		
Dealer A	Hedge fund	Single-name CDS	+9	–9	14	4
		Multi-name CDS	–5	+5		
		Net bilateral position	+4	–4		
		Collateral received (+) / posted (–)	+8	–8		
Dealer A	Non-financial	Interest rate swap	–4	+4	14	6
		Equity future	+10	–10		
		Net bilateral position	+6	–6		
		Collateral received (+) / posted (–)	0	0		
				Total	41	17

Table A

Bilateral netting and collateralisation reduce counterparty credit exposures.[①] Dealers A and B in Table A are counterparties to an FX option that has a positive market value of 10 to B (and hence a negative market value of 10 to A). If A became bankrupt, B may never get to collect this value. B therefore has a counterparty credit exposure to A via the FX option of 10. To neutralise this counterparty risk, B could request collateral worth 10 from A, which it would retain if A defaulted on its contractual obligations. But A and B are also counterparties to a gold future, which has market value of +3 to A (and hence –3 to B). With a legally enforceable netting agreement, A and B could net market values over these two positions. This would compress the counterparty credit exposures between A and B to a single claim of B on A of 7. B would then only need collateral worth 7 from A to eliminate current counterparty credit exposures. Across all the positions in Table A, the sum of positive market values (or, equivalently, the sum of negative market values), known as the "gross market value", is 41. The sum of positive (or negative) market values after bilateral netting, known as the "gross credit exposure", is 17. Graph A (green line) shows that the ratio of gross credit exposure to gross market value in the OTC derivatives market has fallen in recent years, notably so in 2008, consistent with an increase in bilateral netting.[②] In addition, Graph A (red line) shows that total collateral received (or, equivalently, total collateral posted) has risen relative to gross credit exposures, as rates of collateralisation of net positions have increased. Data on collateral used in the numerator of this ratio came from the International Swaps and Derivatives Association (ISDA), although the reported figures were halved, as ISDA calculates the amount of collateral on a different basis, whereby "collateral assets are counted twice, once as received and once as delivered".[③]

Netting and collateralisation in the OTC derivatives market[1]



[1] Gross credit exposure excludes contributions of credit default swaps of non-US reporting institutions.

Sources: ISDA; BIS calculations. Graph A

An average collateralisation rate of 100% does not ensure that all current counterparty exposures have been eliminated. This is because counterparty credit exposures are often over- or undercollateralised, as is the case for the positions in Table A between Dealer A and the hedge fund and Dealer A and the non-financial corporation respectively. Firms may demand overcollateralisation to protect against losses on potential future counterparty credit exposures, which could be significantly larger than current exposures depending on how position values evolve. They may concede undercollateralisation if counterparties cannot easily source collateral or have low perceived default probabilities. A better measure of collateralisation than average rates is therefore to cap the collateral of any individual position at 100%. This would be equivalent to measuring the fraction of *current* counterparty credit exposures backed by collateral. Only a high value of this metric could generate confidence that there were no large uncollateralised counterparty credit exposures in the financial system.

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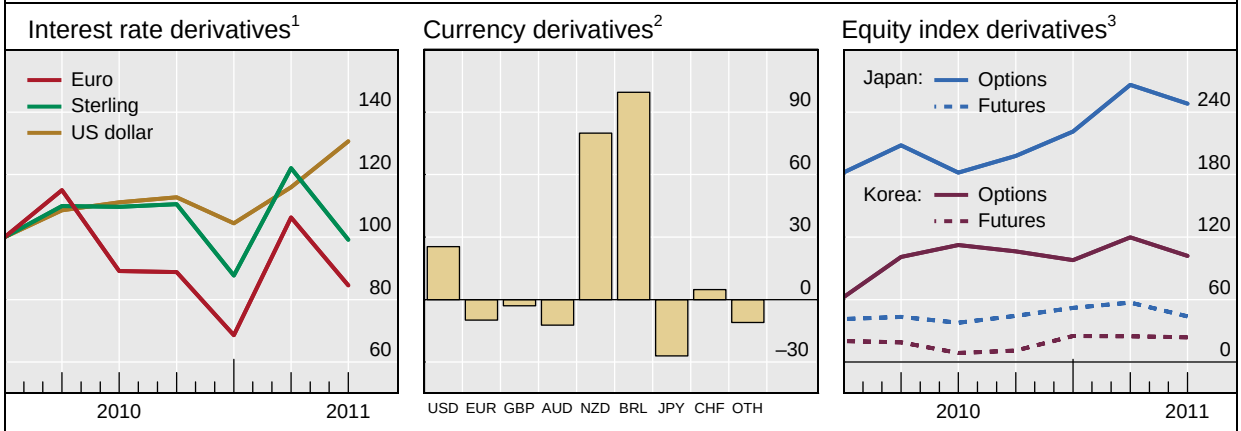
① Counterparty credit risk may also be reduced via trade compression, which tears up redundant contracts on a multilateral basis. See, for example, N Vause, "Counterparty risk and contract volumes in the credit default swap market", *BIS Quarterly Review*, December 2010. ② Including via the transfer of positions vis-à-vis multiple original counterparties to a much smaller number of central counterparties, which is explained in Vause (2010), op cit. ③ See, for example, ISDA, *ISDA Margin Survey 2011*, April 2011. This also reports an aggregate collateralisation rate, which is the average rate of collateral received against pre-collateral counterparty credit exposures by its membership, which includes the major derivatives dealers. For this to be representative of the whole market, however, it would require ISDA non-members to receive collateral at similar rates against exposures (or, almost equivalently, for ISDA members to post collateral at the same rate).

positions.[13] Short-term interest rates on the Brazilian real, for example, increased as the Central Bank of Brazil raised its policy rate from 11.75% to 12.25% during the second quarter, having already boosted it by 50 basis points towards the end of the first quarter. This widened the gap vis-à-vis the US policy rate to 12 percentage points. Currency derivatives can be used to speculate that such interest differentials will not be offset by currency movements. Open interest in currency derivatives referencing the Brazilian real almost doubled during the second quarter (Graph 9, centre panel), boosting the share of such contracts in total currency derivatives positions from 14% to

[13] A USD/BRL forward contract, for example, is a synthetic carry trade as it has the same payoff as a traditional carry trade that borrows USD, exchanges this for BRL at the prevailing exchange rate, and invests in BRL for the duration of the forward contract.

Exchange-traded derivatives

Open interest in futures and options contracts



AUD = Australian dollar; BRL = Brazilian real; CHF = Swiss franc; EUR = euro; GBP = pound sterling; JPY = Japanese yen; NZD = New Zealand dollar; OTH = other currencies; USD = US dollar.

[1] Index (end-2009 = 100). [2] Change during second quarter of 2011 in derivatives referencing selected currencies as either leg; in per cent. [3] In billions of dollars.

Sources: FOW TRADEdata; Futures Industry Association; BIS calculations. Graph 9

23%. Open interest in currency derivatives referencing the New Zealand dollar also rose sharply, but from a much lower base.

Korean options trading drove a decline in equity index exposures

The modest rise in trading of equity index derivatives in the second quarter was driven by strong turnover growth in the Korean options market. Growth of 18% boosted the share of total equity index transactions accounted for by these options to 36%, up from 31% in the previous quarter. The trades brought about a 15% decline in outstanding Korean options positions, which along with declines in outstanding Japanese futures (–23%) and options (–7%) contributed to an overall decline in open interest in equity index derivatives of 2% (Graph 9, right-hand panel). Open interest in North American (–1%) and European (+3%) equity indices were little changed.

Open interest in some commodity derivatives fell in May, when prices declined sharply

Turnover and open interest in commodity derivatives varied across segments of the market. Trading in precious metals futures increased by 13% and open interest rose by 6% during the second quarter, perhaps as investors sought safe havens from sovereign credit and inflation risks. This is consistent with Commodity Futures Trading Commission (CFTC) data, which show that "non-commercial" traders such as asset managers increased their net long positions in gold futures during this quarter. This overall second quarter increase in precious metals open interest was interrupted by a sharp fall in May, however, as silver prices crashed during the early part of the month. Outstanding positions in energy futures (–2%) and options (–4%) also fell in May, coinciding with a correction in oil prices, although positions in energy derivatives were broadly unchanged over the quarter. Trading increased by 4% in agricultural derivatives, while open interest declined by about 11%. Producers and consumers may have felt less need to hold hedging positions after agricultural prices stabilised towards the end of the first quarter, after rising for many months. This is consistent with CFTC data showing lower "commercial" positions in corn and wheat futures.

Enisse Kharroubi

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The trade balance and the real exchange rate[1]

Globalisation has affected the relationship between the trade balance and the real exchange rate in two ways. On the one hand, the growth of trade taking place within industries makes the trade balance more sensitive to real exchange rate movements. On the other hand, a higher degree of vertical specialisation and more global supply chains act to reduce this sensitivity. The relative importance of these two effects varies across countries. According to the estimates presented in this article, changes in the real exchange rate could play a larger role in curbing the US trade deficit than in reducing the Chinese trade surplus. This confirms that real exchange rate adjustment is only part of the solution for global rebalancing, and needs to be accompanied by other policy actions.

JEL classification: F32, F42.

Movements in real exchange rates could facilitate current account adjustment …

Current account imbalances remain substantial across the globe, creating the risks of protectionism and financial vulnerabilities should the capital flows financing these imbalances suddenly dry up (BIS (2011)). Putting the world economy on a more balanced growth path implies that large trade surpluses, notably in emerging economies, and large trade deficits, especially in developed economies, would have to be reduced. Yet global rebalancing is a slow, long-drawn-out process. Boosting domestic demand and moving away from export-led growth in surplus countries, and reducing the reliance on consumption-led growth in deficit countries, cannot be carried out over a short period of time. Moreover, coordinating these shifts to avoid abrupt fluctuations in world aggregate demand is by no means an easy task. Exchange rates have therefore taken centre stage in the policy debate on how to achieve global rebalancing. Exchange rates can move quickly and by significant amounts. And by virtue of being an international relative price they can help reduce possible coordination issues.

The view that movements in exchange rates will facilitate global rebalancing is based on two assumptions. The first is that real exchange rates differ significantly from the fundamental value that is consistent with modest

[1] The views expressed in this article are those of the author and do not necessarily reflect those of the BIS. I am grateful to Claudio Borio, Stephen Cecchetti, Dietrich Domanski and Christian Upper for useful comments on earlier drafts of this article, and to Jhuvesh Sobrun for able research assistance.

internal and external imbalances.[2] This seems particularly likely in many emerging markets, where regulations such as capital controls or government-controlled prices result in significant deviations of the real exchange from its long-run fundamental value.[3]

The second assumption is that a country's trade balance is actually sensitive to movements in the real exchange rate. If trade balances and real exchange rates do not exhibit a close relationship, then changing the value of the currency will be of little help in closing trade gaps. Understanding what determines the sensitivity of the trade balance to real exchange rates is therefore fundamental to assess whether movements in real exchange rates can affect trade flows significantly and thereby effectively contribute to global rebalancing. This will be the article's focus.

... if intra-industry trade is high and vertical specialisation low

Based on the experience of OECD countries over the last 20 years, globalisation can be seen to have affected the relationship between real exchange rates and trade balances in two ways. On the one hand, the development of international trade within – as opposed to between – industries has led countries to trade similar types of goods. This has raised the substitutability between the types of goods imported and exported and thereby *increased* the sensitivity of the trade balance to the real exchange rate. On the other hand, the development of global supply chains and vertical specialisation across countries has raised the complementarity between the types of goods imported and exported, thereby *reducing* the sensitivity of the trade balance to the real exchange rate. The relative importance of these two effects varies across countries. For example, trade balances in countries such as the United Kingdom and France, which have a high level of intra-industry trade, are much more sensitive to movements in exchange rates than those of, for example, Ireland and Greece, where exports and imports affect different industries. Turning to China and the United States, the relatively low intra-industry trade index in China compared to the United States implies that the latter can expect a larger reduction in its trade deficit from an exchange rate depreciation than the drop in the trade surplus that China would experience from an exchange rate appreciation. This confirms that achieving global rebalancing will need more than real exchange rate adjustment.

The remainder of this article is organised as follows. The first section lays down the framework of the analysis and provides a brief description of the data. The following section presents the empirical approach and estimation results, and the closing section discusses some of the policy implications of the findings and draws conclusions.

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[2] In this case, real exchange rate adjustment can have an equilibrating effect. Another issue, however, is that different methods to assess "equilibrium" real exchange rates can actually yield very different results.

[3] For example, according to Rogoff (1996) the half-life of real exchange rates is estimated in the range of three to five years. In other words, it takes three to five years for a real exchange rate to close half of the gap to the equilibrium value after a given shock. See also Edwards (1989) for a discussion of the role of economic policies in real exchange rate misalignments. Finally, see Cheung et al (2009) for a description of methods to compute real exchange rate misalignments with an application to the Chinese renminbi.

Globalisation patterns

An increase in trade shares of GDP ...

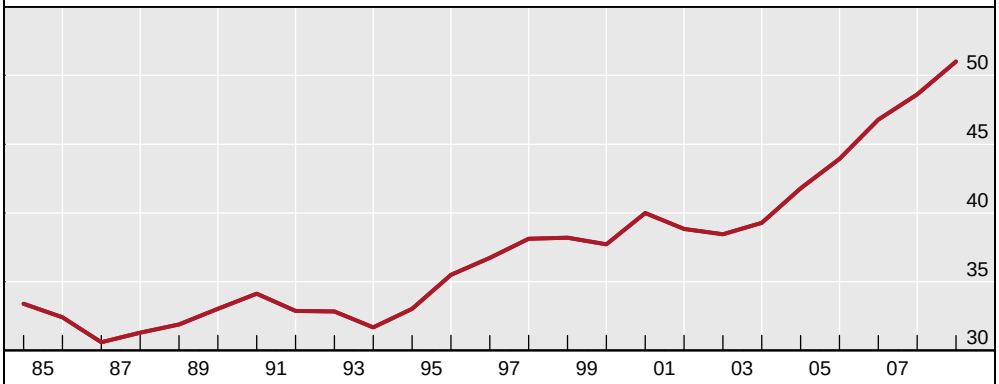
The world economy has become increasingly globalised over the past 30 years. The growth in the ratio of international trade to GDP for a group of OECD countries illustrates this trend (Graph 1). The sum of imports and exports increased from about one third of GDP in the mid-1980s to just over one half by the late 2000s. Imports and exports therefore outgrew GDP on average by around 1 percentage point per year over the period. But globalisation has deeper implications than a simple increase in the volume of international transactions.

... reflects more trade within industries ...

Globalisation has affected the substitutability between the types of goods imported and exported. To illustrate how this substitutability can be measured empirically, it is useful to compare a country that imports and exports different types of goods with a country that imports and exports similar types of goods. The first country should typically run a trade deficit for some goods and a trade surplus for other goods. Individual industries should thus deviate significantly from balanced trade. By contrast, trade should be relatively more balanced industry by industry in the second country. At the aggregate level, the sum of industry deviations from balanced trade – normalised by total trade – can therefore measure the extent to which an economy trades either similar or different types of goods. The larger the normalised sum of deviations from balanced trade, the more likely it is that an economy trades different types of goods. Building on this intuition, we can construct a measure of intra-industry trade (IIT)[4] that is equal to zero when a country's international trade takes place exclusively between industries, ie when there is no overlap between the types of goods imported and exported, and equal to one if a country's

Ratio of imports and exports to GDP in selected OECD countries[1]

GDP-weighted average, in per cent



[1] The OECD countries included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Iceland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Sources: OECD; BIS calculations. Graph 1

[4] Following Grubel and Lloyd (1975), the index for intra-industry trade is $IIT_t = 1 - \sum|X_{it} - M_{it}| / \sum|X_{it} + M_{it}|$, where X_i and M_i denote respectively exports and imports of goods of sector i.

international trade is transacted exclusively within industries, ie when there is a perfect overlap between the types of goods imported and exported.[5]

Based on this intuition, the sensitivity of the trade balance to movements in real exchange rates should be much lower in a country with a low level of intra-industry trade (low IIT) than in a country with high IIT. Its imports are unlikely to fall significantly following a real exchange rate depreciation because no domestic industry can easily replace the imports that have become more expensive. Low IIT countries are typically those where raw materials or natural resources like oil account for a major share of imports. They could also be countries that have specialised in particular industries in order to benefit from a comparative advantage in some sectors. By contrast, imports fall much more in a high IIT country that depreciates its real exchange rate, as the country can more easily provide domestic substitutes for imports that have become more expensive. The sensitivity of the trade balance to the real exchange rate should therefore depend positively on IIT.

The IIT index has changed significantly both across countries and over time.[6] European countries typically have a high IIT index, whereas larger economies such as Japan or the United States have lower IIT (Graph 2). A special case is Norway, a commodity exporter with lower IIT than its European peers. Some economies, shown in the upper panels of Graph 2, have experienced a steady increase in IIT. In others, shown in the lower panels, IIT has not shown any significant upward or downward trend. In the case of the United States and United Kingdom, IIT moved in parallel with the aggregate trade balance over the last 10 years.[7]

... and more globalised production chains

Globalisation has also affected the complementarity between the types of goods that are imported and exported. The different stages involved in the production of a given good can either be carried out in a single country or split across several countries. The degree of complementarity between imports and exports is typically higher if there are more goods whose production process is split across several countries. These different countries trade intermediate goods and are said vertically specialised. International vertical specialisation, which is behind the buzzword of "global supply chains", has been an important aspect of the recent globalisation process, especially since developing economies have emerged as competitive production centres for low- and medium-skilled tasks.[8]

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[5] Economies of scale and trade in varieties of products are the main theoretical reasons why countries may trade similar types of goods. See Krugman (1979), Lancaster (1980) and Helpman and Krugman (1987).

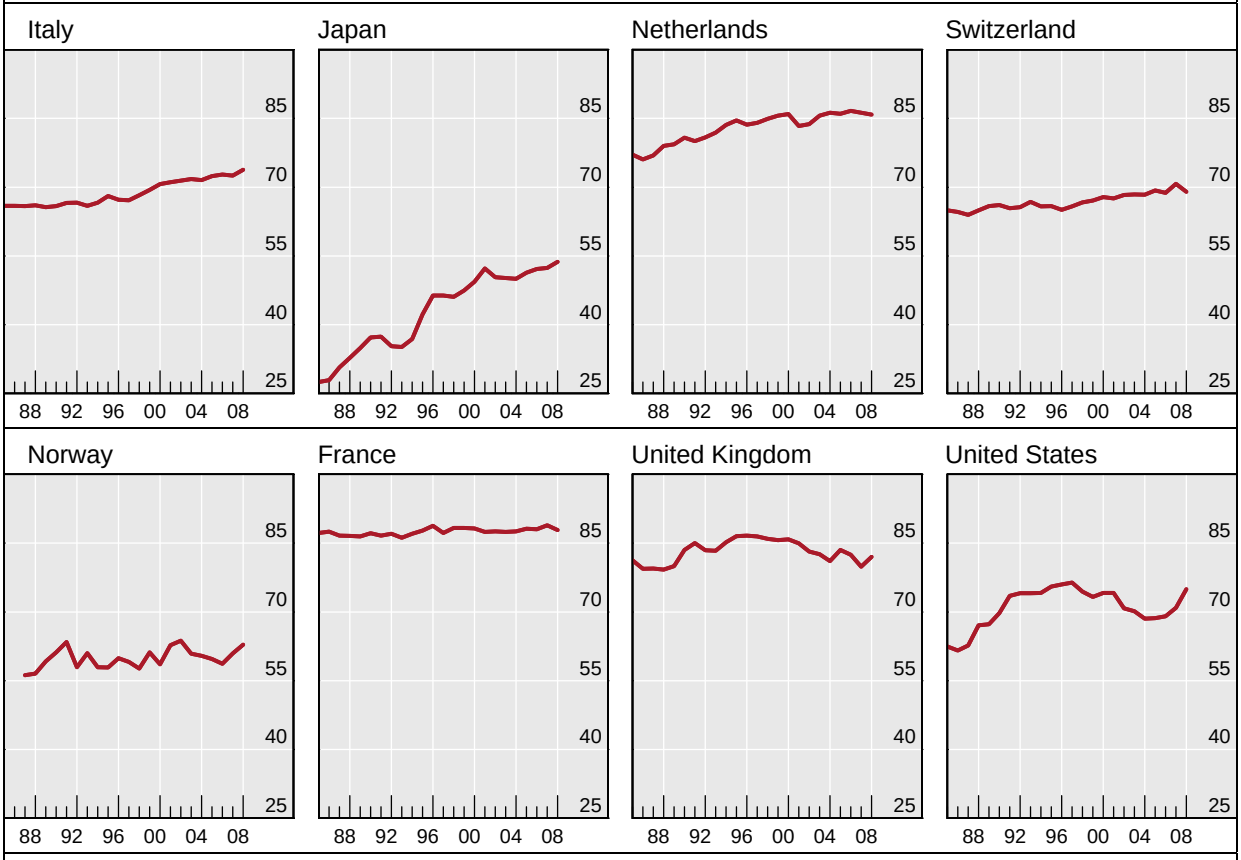
[6] Brülhart (2009) provides an extensive empirical study of intra-industry trade patterns around the globe for the period 1962–2006.

[7] IIT typically decreases when a country's trade deficit increases across all sectors.

[8] To be precise, vertical specialisation applies to firms which choose to specialise in some stages of production and outsource the others, regardless of where outsourcing takes place. "Global supply chains" refers to the carrying-out of those processes in different countries.

Evolution of the IIT indicator, 1986–2008

In per cent



Source: OECD. Graph 2

Input-output tables that measure the flow of goods between different sectors allow us to measure the development of global supply chains. The resulting measure of the import content of exports (ICE) represents the extent to which a country's international trade is vertically integrated, as it measures the contribution of imports in the production of exported goods and services.[9, 10]

When a country is vertically specialised, the volume of its exports depends on the volume of its imports since some exports are manufactured using imports as inputs. The trade balance should hence be less sensitive to changes in the real exchange rate in countries which are more vertically specialised. A tighter co-movement between exports and imports should reduce the trade balance response to a change in the real exchange rate.[11]

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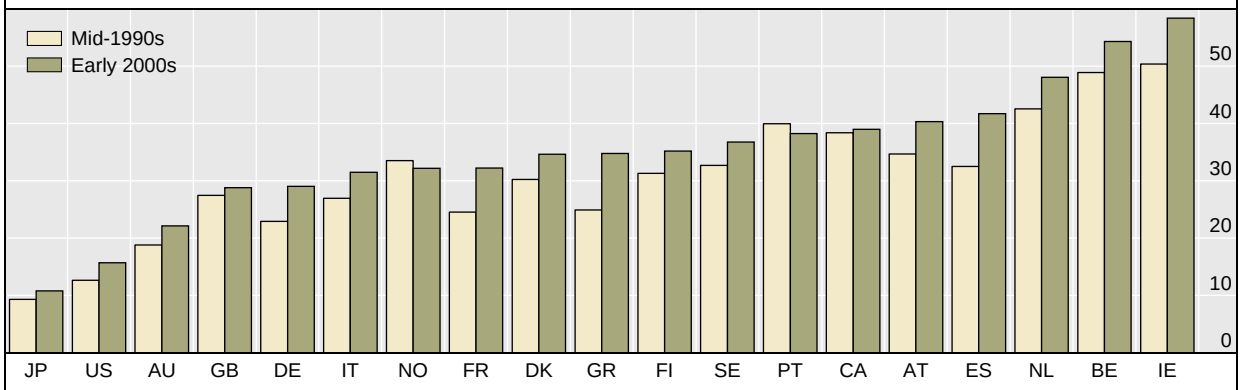
[9] The import content of exports is computed as $ICE = U.A_m.(I - A_d)^{-1}.X$, where A_m and A_d are the input-output coefficient matrices for imported and domestic transactions, respectively, I is the diagonal matrix, U denotes a $1 \times n$ vector each of whose components is 1 for corresponding import types, and X is the export vector.

[10] See Meng et al (2010) for a more detailed discussion of vertical specialisation indicators based on input-output tables.

[11] The data do indeed show that countries which display a higher ICE index also exhibit a higher correlation between imports and exports to GDP.

Import content of exports

In per cent



AT = Austria; AU = Australia; BE = Belgium; CA = Canada; DE = Germany; DK = Denmark; ES = Spain; FI = Finland; FR = France; GB = United Kingdom; GR = Greece; IE = Ireland; IT = Italy; JP = Japan; NL = Netherlands; NO = Norway; PT = Portugal; SE = Sweden; US = United States.

Source: OECD. Graph 3

The extent to which exports actually embed imports differs significantly across countries (Graph 3). For example, ICE is lowest in Japan and the United States and highest in Ireland and Belgium. Moreover, it has generally increased over time. In particular, European countries such as Spain, Germany and France have experienced significant increases in the ICE index ranging between 25 and 33%.

Model estimation

An econometric model of the trade balance …

This section provides estimates on how the two channels described above affect the sensitivity of a country's trade balance to its real exchange rate. It builds on Goldstein and Khan's (1985) reduced form model of the trade balance. In their approach, the trade balance depends negatively on domestic income, positively on foreign income, and negatively on the real exchange rate (an increase in the real exchange rate being equivalent to an appreciation). The model is adapted as follows: the dependent variable is the ratio of each country's total trade balance to its GDP (TB). The independent variables are: (i) the growth rate of domestic absorption,[12] to control for the demand for imports (DAG);[13] (ii) the real effective exchange rate, to control for external competitiveness (REER);[14] and (iii) interaction terms between the real effective exchange rate on the one hand, and IIT and ICE on the other hand (REER×IIT

[12] Domestic absorption is the sum of private consumption, general government consumption and gross domestic investment. The volume measure is computed using the GDP deflator.

[13] Including the weighted average of trading partners' growth as a control for the demand for exports resulted in statistically insignificant coefficients that moreover often had the wrong sign. This variable was therefore excluded, which had virtually no impact on the results documented below.

[14] There are two possible measures for the real effective exchange rate. The first is computed using relative consumer prices, the second using unit labour costs. The regressions presented below use the real effective exchange rate based on relative consumer prices. Using the alternative measure yields similar results.

and REER×ICE), which allow us to test how the types of goods traded and/or the dependence of exports on imports affect the impact of a change in the real effective exchange rate on the trade balance. The interaction term between the real effective exchange rate and IIT is expected to have a negative sign, since a high IIT raises the sensitivity of the trade balance to the real exchange rate. By contrast, the interaction of the real effective exchange rate and ICE is expected to have a positive sign, since a higher ICE should reduce the sensitivity of the trade balance to the real exchange rate. Finally, IIT and ICE are introduced as independent variables on their own so as to separate their possible direct effect on the trade balance from their effect on the sensitivity of the trade balance to the real exchange rate.

The model is estimated for a panel of 20 OECD countries over the period 1985–2008.[15] Real effective exchange rates are from the IMF's *International Financial Statistics* and macroeconomic variables from the OECD's *Economic Outlook*. IIT and ICE are computed from the OECD-STAN. To control for unobserved cross-country heterogeneity, country fixed effects are included. There is an important data limitation. ICE is observed for only three subperiods (mid-1990s, late 1990s and mid-2000s), so it was "extended" to a longer sample (1993–2005) using for each country a quadratic interpolation.[16] Denoting *i* the country index, *t* the time index and the estimated parameters and the residual with Greek letters, the empirical specification is

$$TB_{i,t} = \alpha + \beta.DAG_{i,t} + \gamma.REER_{i,t} + \delta.IIT_{i,t} + \eta.REER_{i,t} \times IIT_{i,t} + \theta.ICE_{i,t} + \lambda.REER_{i,t} \times ICE_{i,t} + \varepsilon_{i,t}$$

... confirms the existence of the two channels

The estimation results, collected in Table 1, confirm the existence of the two channels. A first set of regressions (columns (i)–(iii)) focuses on the effect of IIT on the sensitivity of the trade balance to the real exchange rate, while a second set of regressions (columns (iv)–(v)) shows the effect of IIT and ICE on the sensitivity of the trade balance to the real exchange rate. Across all estimations, domestic absorption growth does have a significant and negative effect on the trade balance when country fixed effects are introduced, but not otherwise. This confirms that a country that grows faster experiences, all else equal, a fall in its trade surplus (or an increase in its trade deficit).

Turning first to the real effective exchange rate, columns (i)–(iii) show that it is insignificant once country fixed effects are introduced. This is probably

[15] The countries included in the sample are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States. Due to data availability, it was not possible to include emerging market economies in the sample. This is the main reason why the study focuses on OECD countries.

[16] The quadratic interpolation is built up assuming that the first point (mid-1990s) is reached in 1995, the second (late 1990s) in 2000 and the last (mid-2000s) in 2005. To reduce the possible errors that would stem from this interpolation procedure, instead of including the index directly, a dummy variable is constructed that is equal to one when the ICE index is above the median of the ICE distribution and zero otherwise. The estimation hence tests whether the sensitivity of the trade balance to the real exchange rate is significantly lower for a country whose ICE index is above the median compared to a country whose ICE index is below, controlling for other factors that may influence this sensitivity, such as the extent to which trade happens within industries.

Estimation results					
	(i)	(ii)	(iii)	(iv)	(v)
Domestic absorption growth	**–0.075** (0.123)	**–0.153**** (0.072)	**–0.209**** (0.087)	**–0.275*** (0.136)	**–0.382***** (0.121)
Real effective exchange rate	**0.209***** (0.060)	**0.024** (0.040)	**–0.020** (0.040)	**0.153***** (0.034)	**0.142***** (0.033)
Interaction (real effective exchange rate and IIT)	**–0.279***** (0.093)	**–0.202***** (0.062)	**–0.153**** (0.062)	**–0.330***** (0.054)	**–0.331***** (0.051)
Intra-industry trade	**0.318***** (0.074)	**0.245***** (0.050)	**0.036** (0.049)	**0.378***** (0.071)	**0.310***** (0.072)
Interaction (real effective exchange rate and above median ICE dummy)				**0.071***** (0.031)	**0.069**** (0.032)
Above median ICE dummy				**–0.069** (0.030)	**–0.071***** (0.031)
Country dummies	No	Yes	Yes	Yes	Yes
Time dummies	No	No	Yes	No	Yes
Time span	1985–2008	1985–2008	1985–2008	1993–2005	1993–2005
Observations	491	491	491	247	247

The dependent variable is the trade balance as a share of GDP. Domestic absorption growth is the growth rate of the sum of private consumption, gross domestic investment and government consumption. The real effective exchange rate is computed using relative consumer prices. IIT is the index for intra-industry trade. The above median ICE dummy is a variable which is equal to one if the country's ICE is above the median and zero otherwise. Interaction variables are the product of the variables in parentheses. Estimation coefficients are in bold. Robust standard errors are in parentheses below the estimation coefficients. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.

Table 1

because real exchange rate variations over time are relatively small compared to cross-country variations. Yet this does not imply that real effective exchange rates have no significant impact on the trade balance. On the contrary, the estimated coefficient for the interaction term between the real effective exchange rate and IIT is always negative and significant. Hence an appreciation (depreciation) in the real effective exchange rate always reduces (increases) the trade balance, the more so when IIT is higher, ie when trade takes place more within and less between industries. Based on the estimated coefficients (column (ii)), a one standard deviation depreciation in the real effective exchange rate improves the trade balance by 0.9 percentage points of GDP for a country at the lower quartile of the IIT distribution. The same figure rises to 1.25 percentage points of GDP for a country at the upper quartile of the IIT distribution, around 40% larger that in the previous case.

Next, we turn to estimations (iv)–(v), which evaluate the impact of IIT and ICE on the sensitivity of the trade balance to the real effective exchange rate. First, they also support the hypothesis that the trade balance is more sensitive to changes in the real effective exchange rate in countries where trade takes place more within industries. It is interesting to note that the coefficient is actually larger (in absolute value) than in the case where ICE is not controlled for. This probably reflects the fact that both indicators have increased in

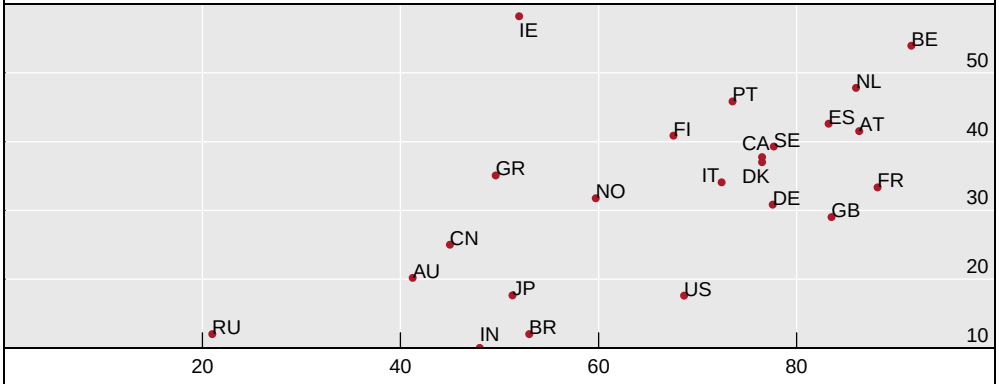
parallel in many countries. If ICE has an opposite effect to IIT on the sensitivity of the trade balance to the real effective exchange rate, such collinearity should push up the estimated coefficient on IIT when ICE is controlled for. Second, the interaction term between the real effective exchange rate and the dummy for above median ICE is positive and significant. Given that the trade balance sensitivity to the real exchange rate is negative, this positive coefficient implies that the estimated sensitivity of the trade balance to the real exchange rate is significantly smaller for a country whose ICE index is above the sample median. Put differently, a country whose ICE index moved above the median would experience a drop in the sensitivity of the trade balance to the real effective exchange rate. To fix ideas, consider a country whose IIT index is below the sample median. Based on the estimation results in columns (iv) and (v), the sensitivity of the trade balance to the real exchange rate is around 9% when the ICE index is below median. This means that a 1 percentage point depreciation in the real exchange rate translates into a 9 percentage point increase in the trade balance. Conversely, the sensitivity of the trade balance to the real exchange rate is not significantly different from zero when the ICE index is above median. In this case, a depreciation in the real exchange rate would not have any significant effect on the trade balance.

Policy implications and conclusions

The estimations presented in this special feature indicate that countries that can expect an improvement in their trade balance through a depreciation in the real effective exchange rate are those which feature both a high IIT index and a low ICE index. Conversely, countries with low IIT but high ICE should not expect depreciating their real effective exchange rate to bring a significant increase in their trade balance. To draw some policy implications, consider the 2005 figures for the ICE and IIT index in a group of countries (Graph 4).

Intra-industry trade vs import content of exports, 2005[1]

In per cent



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[1] Intra-industry trade is shown on the horizontal axis and import content of exports on the vertical axis.

Source: OECD. Graph 4

Countries located in the bottom right-hand corner can expect a larger gain in their trade balance from depreciating their real effective exchange rate. By contrast, countries located in the top left-hand corner can expect the lowest gain in their trade balance from depreciating their real effective exchange rate. This simple comparison shows that there is a large variety in what countries can expect from using the exchange rate as a policy tool to boost their trade balance and hence their growth. For instance, the United States is likely to benefit more from a real exchange rate depreciation than Japan since it features a relatively similar ICE index but a relatively higher IIT index. Applying the results of this study to a country like China, the relatively low IIT index in this country suggests that a real exchange rate appreciation is unlikely to reduce the Chinese trade surplus significantly. This confirms the view that global rebalancing is likely to require more efforts than simply adjusting exchange rates.

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Global credit and domestic credit booms[1]

US dollar credit is growing quickly outside the United States, especially in Asia, and in some economies it has outpaced overall credit growth. Cross-border sources of credit bear watching in view of their record of outgrowing overall credit in credit booms. Foreign currency and cross-border sources of credit raise policy issues.

JEL classification: E5, F3.

As emerging market central banks tighten monetary policy, they face the challenge of borrowers obtaining credit from abroad or in lower-yielding currencies such as the US dollar. While such credit may not account for a high share of overall credit in larger economies, it can still contribute to unwelcome credit growth. For example, foreign currency credit to non-financial businesses and households in China more than doubled in the two years to March 2011. (Foreign currency credit to mainland-related borrowers in Hong Kong SAR is showing a similar trend.) Despite its small overall share, this credit growth would raise concerns if sustained.

This special feature addresses the international dimension of credit, defined here to comprise two different but related components: foreign currency credit to residents, regardless of the lender's location; and cross-border (external) credit, regardless of the currency of denomination.[2] We measure these components by combining BIS international financial statistics and national sources (see box) and we identify regularities in their behaviour, both in the aggregate and in individual countries. Some findings stand out.

First, a good part of global credit denominated in US dollars is extended to residents outside the United States, reflecting the currency's international role. The same is true of the euro and the euro area, albeit to a lesser degree than for the dollar. Since the crisis, US dollar credit has grown faster outside the

[1] We thank Pablo García-Luna and Jimmy Shek for superb research assistance and Stephen Cecchetti, Piti Disyatat, Dietrich Domanski, Guonan Ma and Christian Upper for comments. The views expressed are those of the authors and do not necessarily reflect those of the BIS.

[2] See Borio and Lowe (2002) and Schularick and Taylor (2009) for domestic credit and Alessi and Detken (2009), Borio and Drehmann (2009), Bruno and Shin (2011) and Cetorelli and Goldberg (2011) for analyses that pay attention to international components. Since credit is a possible proxy for "liquidity", our focus on its international dimension can help shed light on "global liquidity" – see Caruana (2011) and Bruno and Shin (2011).

United States, but in only a few economies is it contributing disproportionately to rapid credit growth.

Second, cross-border credit bears watching by national authorities in view of its history of outgrowing overall credit in economies experiencing credit booms. Private borrowers obtain credit directly from abroad or indirectly gain access to the credit that local banks obtain from abroad, notably from other banks.

This special feature is organised in three parts. First, we estimate global credit in key currencies and its contribution to overall credit growth in particular countries. Second, we measure external sources of credit in domestic credit booms. Finally, we draw implications for the policy challenges facing the authorities. We highlight the policy constraints that international forms of credit create, how BIS statistics can help monitor these types of credit, and how Basel III's new countercyclical capital buffer and international coordination can help address some of the associated risks.

Global credit in international currencies

While most currencies are little used outside their country of issue, the US dollar's and the euro's domain of use, if not the yen's, extends well beyond their home territory (Graph 1). Moreover, credit denominated in a particular currency can grow at very different rates at home and abroad, even with a single overnight rate and benchmark swap yield curve.

Much US dollar credit is extended to borrowers outside the United States …

Non-US residents have borrowed sizeable amounts of US dollars. The stock of dollar credit to borrowers outside the United States amounted to $5.8 trillion (Graph 1, top left-hand panel), or 12% of global (ex-US) GDP. Except in cases like Cambodia, where most bank credit is in dollars, lower shares are the norm. The dollar share of total credit to non-financial private borrowers ranges from single-digit percentages in Brazil, China, India, Korea and Thailand to between a fifth and a third in the Philippines, Hong Kong SAR and Mexico (Table 1).

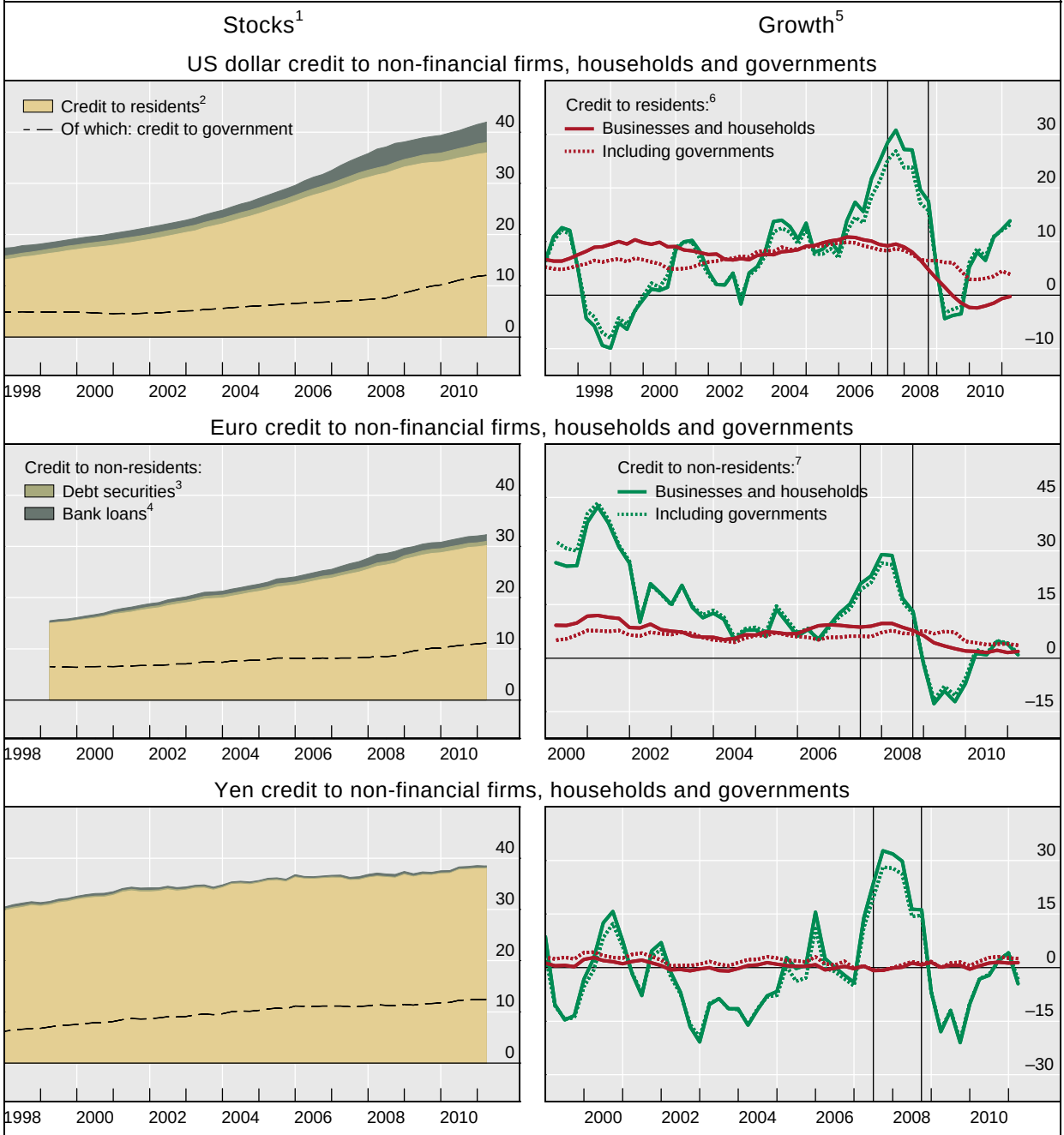
Credit extended in euros to borrowers outside the euro area, amounting to €2.1 trillion (Graph 1, middle panels), is more concentrated than its US dollar counterpart. In particular, many mortgages and business loans in central and eastern Europe are written in euros (or Swiss francs). In September 2007, foreign currency credit stood at a quarter or a third of total bank credit in the Czech Republic and Poland, more than half in Hungary and about 90% in the Baltic states.[3]

… and is growing rapidly

Since the global financial crisis, US dollar credit to non-US residents has resumed robust growth, in contrast to its euro and yen counterparts (Graph 1, right-hand panels). Credit to non-residents in US dollars, euros and yen, after growing at high rates in the run-up to the turmoil, actually shrank for several quarters subsequently. The resumption of double-digit growth of US dollar

[3] Brown et al (2009) provide estimates of foreign currency lending by domestic banks in the region, to which McCauley (2010) adds cross-border loans to non-banks in foreign currency.

Global credit in dollars, euros and yen



[1] In trillions of US dollars. [2] Credit to non-financial sector residents of the United States/euro area/Japan from national flow of funds, excluding identified credit to these borrowers in non-domestic currencies (ie cross-border and locally extended loans and outstanding international bonds in non-domestic currencies). [3] Outstanding debt securities issued by non-financial non-residents of the United States/euro area/Japan. [4] Cross-border and locally extended loans to *non-banks* outside the United States/euro area/Japan. For China and Hong Kong SAR, locally extended loans are derived from national data on total local lending in foreign currencies on the assumption that 80% are denominated in US dollars. For other non-BIS reporting countries, local US dollar/euro/Japanese yen loans to non-banks are proxied by all BIS reporting banks' gross cross-border US dollar/euro/Japanese yen loans to banks in the country. [5] Year-on-year growth, in per cent. The vertical lines represent the start of the recent financial crisis at end-Q2 2007 and the collapse of Lehman Brothers at end-Q3 2008. [6] Total credit to the non-financial sector in the United States/euro area/Japan (dotted lines) and total credit excluding credit to government sector in the United States/euro area/Japan (solid lines). [7] Total credit to the non-financial sector outside the United States/euro area/Japan (dotted lines) and total credit excluding credit to governments (solid lines).

Sources: People's Bank of China; Hong Kong Monetary Authority; ECB; Bank of Japan; Board of Governors of the Federal Reserve System; BIS international debt statistics and locational banking statistics by residence. Graph 1

credit to non-US residents stands in sharp contrast to private credit growth in the United States as well as to that of the euro and yen counterparts. From the first quarter of 2009 to the first quarter of 2011, dollar credit to non-financial private borrowers in the rest of the world actually grew by $1.1 trillion.

China has experienced rapid overall credit growth and even more rapid foreign currency credit growth. Dollar and other foreign currency credit to the non-financial private sector more than doubled in two years to reach an estimated $0.5 trillion in March 2011 (Table 1) while overall credit rose by a half. In addition, banks in Hong Kong SAR in 2010 increased their loans to non-bank mainland firms, including affiliates in the territory, by 47% – a rise that the Hong Kong Monetary Authority (2011) has dubbed "unsustainable". Thailand and the Philippines also saw dollar credit growth outpace overall credit growth.

Elsewhere, the rate of expansion of foreign currency credit relative to overall credit has not been as high. In other Asian economies, foreign currency credit grew in tandem with overall credit, as in Indonesia or Korea, or did not keep up with it, as in India and Malaysia. In Latin America, dollar credit grew by less than overall credit in Mexico and by markedly less in Brazil.

Where do the dollars lent to borrowers in the rest of the world come from? It may be natural to look for funds flowing out of the United States through the interbank channel, the main link between global dollar money markets. Indeed, some observers imagine that the excess reserves in the US banking system created by the Federal Reserve to pay for large-scale bond purchases are "spilling" into the rest of the world, financing dollar credit there. In fact, in the first quarter of 2011, when such Treasury bond purchases boosted bank reserves by $409 billion, banks in the country *increased net liabilities* to the

Total and US dollar credit to the non-financial private sector in selected countries

	UK	XM	HK	CN	IN	ID	KR	TH	MY	PH	BR	MX
Total credit[1]	4,839	21,859	558	8,356	985	208	1,105	345	307	73	1,347	270
US dollar credit[2]	817	873	133	448	85	24	110	16	23	15	107	98
Over GDP[3]	35.5	7.1	58.0	7.4	5.4	3.3	10.6	5.0	9.5	7.9	4.9	9.2
Over total credit[4]	16.3	4.0	23.9	5.4	8.6	11.6	10.0	4.6	7.4	20.9	8.0	36.4
Total credit growth 2009[5]	*10.4*	*10.8*	*60.5*	*52.8*	*60.7*	*70.1*	*31.9*	*41.4*	*42.2*	*25.9*	*88.0*	*20.4*
Dollar credit growth 2009[5]	*17.7*	*10.3*	*62.0*	*111.7*	*37.7*	*69.2*	*35.0*	*1,382*	*31.4*	*196*	*32.7*	*13.6*
Contribution[6]	*2.8*	*0.4*	*14.7*	*4.3*	*3.8*	*8.1*	*3.4*	*6.1*	*2.5*	*17.4*	*3.7*	*5.2*

BR = Brazil; CN = China; HK = Hong Kong SAR; ID = Indonesia; IN = India; KR = Korea; MX = Mexico; MY = Malaysia; PH = Philippines; TH = Thailand; UK = United Kingdom; XM = euro area.

[1] Total credit to non-financial private sector borrowers. [2] For those countries which are reporters in the BIS banking statistics, estimates are constructed as the sum of (i) BIS reporting banks' cross-border loans to non-bank residents, (ii) resident banks' loans to resident non-banks and (iii) outstanding international debt securities issued by non-bank private sector residents, each in the respective currency. For non-BIS reporting countries (China, Indonesia, the Philippines and Thailand), the third component is not available in the BIS banking statistics. For China, locally extended US dollar credit is estimated from national data; for other non-reporters, it is proxied by BIS reporting banks' net cross-border claims on resident banks in the respective currency on the assumption that credit is onlent to non-financial private sector residents. In billions of US dollars. [3] Stock over nominal GDP of the country, in per cent. [4] Contribution of US dollar credit growth to total growth since end-Q1 2009 in credit to non-bank private sector borrowers, in per cent. [5] Percentage change in outstanding stocks between end-Q1 2009 and end-Q1 2011 (for the United Kingdom, end-Q4 2010). [6] Contribution in percentage points of US dollar credit growth to growth of total credit to non-financial private sector borrowers.

Sources: People's Bank of China; Hong Kong Monetary Authority; IMF, *International Financial Statistics*; national flow of funds statistics; BIS locational banking statistics by nationality; BIS international debt securities statistics. Table 1

rest of the world's banks by $209 billion.[4] If anything, interbank *inflows* helped to fund the build-up of excess reserves in the United States, rather than these reserves inducing *outflows* to fund dollar credit to the rest of the world.

Dollar intermediation takes place outside the United States

The reason is simple: US dollar funding can be sourced from beyond US shores, even if dollar payments clear onshore. For one, non-banks deposit dollars outside the United States. Indeed, such bank deposits by non-US residents rose by $363 billion from March 2009 to March 2011. In addition, non-US residents can purchase dollar bonds issued by non-US borrowers. For example, official reserve managers no doubt invested some of the recent increase in official US dollar reserves in highly rated US dollar bonds issued by non-US residents.

External credit and domestic credit booms

Cross-border credit grows faster than total credit during credit booms …

The recent rapid expansion in foreign currency credit bears watching because, in many economies that experienced a credit boom and bust, external (cross-border) credit tended to grow faster than overall credit during the boom.[5] To be sure, there is no one-to-one relationship between the foreign currency credit examined above and the cross-border credit on which this section focuses. Foreign currency credit to residents may be funded by foreign currency deposits or securities held by residents, thus crossing no border. Conversely, cross-border funding may be denominated in domestic currency, as has been typically the case, for instance, in the United States or euro area countries. But in countries where cross-border funding is denominated mainly in foreign currency, the two forms of credit tend to go hand in hand.

… in small economies …

Before the recent financial crisis, external credit outpaced overall credit growth in some small European countries. Graph 2 juxtaposes overall credit to resident households and businesses (red line) with various forms of external credit: direct cross-border credit to them in the form of cross-border loans (orange shaded area) and securities (tan shaded area); and indirect cross-border credit to domestic banks, obtained largely through the interbank market, and which can be onlent to domestic final borrowers. In turn, this indirect credit is measured on a gross basis, or net of lending by domestic banks to non-residents. Gross amounts (dotted green line) are more representative of the overall funding obtained abroad, regardless of its subsequent use. Net amounts (dashed green line) provide a lower bound of the extent to which foreign funding supports credit expansion to domestic private borrowers. In all of the countries in Graph 1, the cross-border components grew faster than overall credit to residents during the boom (bottom panels).

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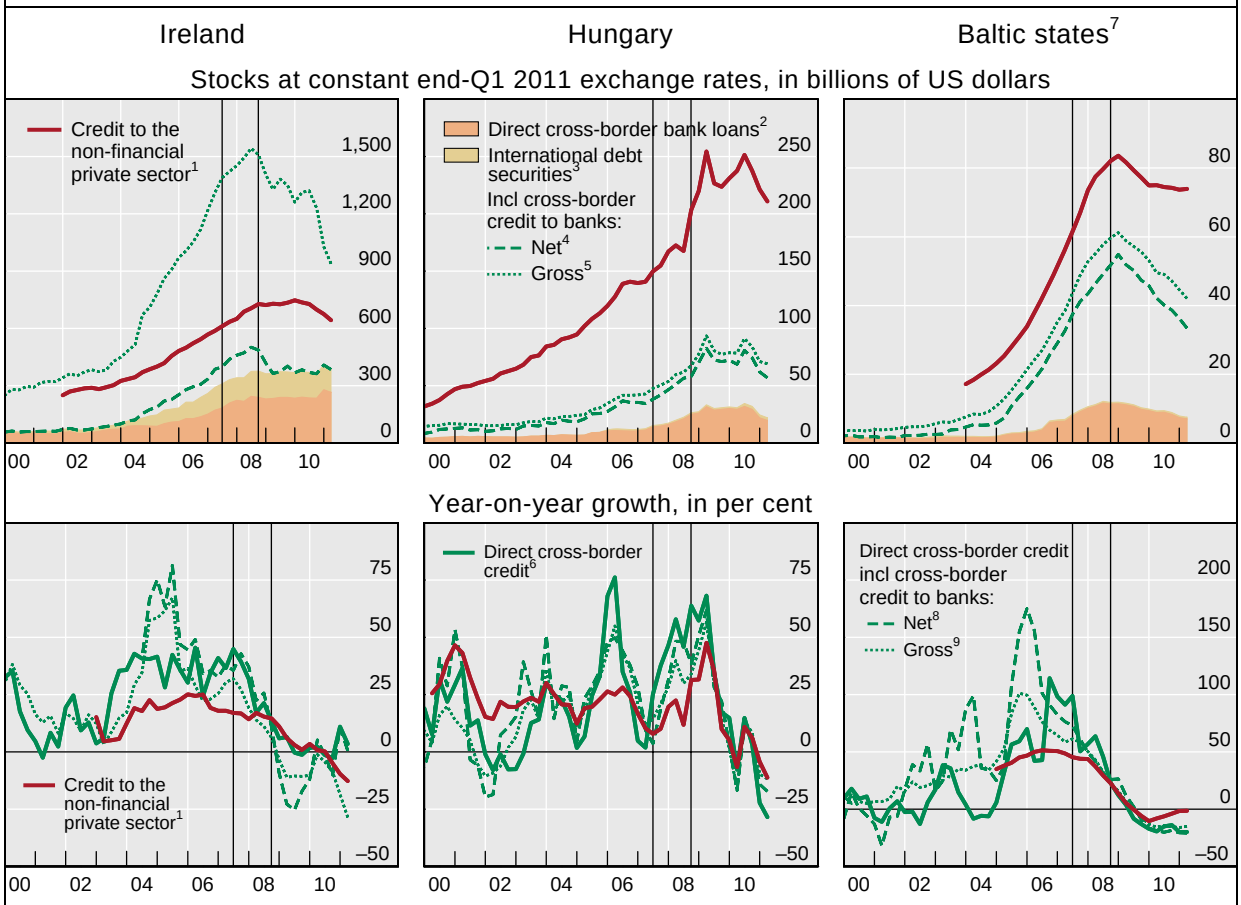
[4] The US flow of funds shows that at end-2010 the US banking system had a small net *liability* of $19 billion to banks outside the country.

[5] Note that a comparison of cross-border with overall credit growth differs from a comparison of external claims with GDP, as in Lane and Milesi-Ferretti (2007). By comparing in the graphs the external component with the total rather than with the purely domestic one, we *underestimate* the difference in the behaviour of the purely domestic and external elements, especially where the external component is a large fraction of the total.

Credit to the non-financial private sector in selected European countries



The vertical lines indicate end-Q2 2007 and end-Q3 2008.

[1] Total liabilities of non-financial private sector borrowers, as reported in the flow of funds statistics. [2] BIS reporting banks' direct cross-border loans to *non-banks* (ie includes loans to non-bank financial entities). [3] Issues of international debt securities by non-financial private sector residents of the country. [4] For Ireland, net cross-border borrowing (liabilities minus claims) if positive from all sectors by banks located in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). For non-BIS reporting countries (Hungary and the Baltic states), BIS reporting banks' net cross-border claims on banks in the country are used. [5] For Ireland, gross cross-border borrowing from all sectors by banks located in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). For non-BIS reporting countries (Hungary and the Baltic states), BIS reporting banks' gross cross-border claims on banks in the country are used. [6] Sum of cross-border bank loans and international debt securities outstanding. [7] Estonia, Latvia and Lithuania. [8] Including net cross-border borrowing (if positive) by banks in the country, on the assumption that this cross-border credit is passed on to non-banks in the country. [9] Including gross cross-border borrowing by banks in the country.

Sources: IMF, *International Financial Statistics*; BIS locational banking statistics; BIS international debt securities statistics. Graph 2

The case of Ireland is particularly striking (left-hand panels). Direct cross-border credit to non-banks in Ireland grew at roughly 40% year on year in the three years prior to the crisis, well above the rate for overall credit to businesses and households. Moreover, in 2004 banks in Ireland began to draw on net cross-border financing (dashed green line, top left-hand panel) to support their domestic lending. Combined, these two cross-border components amounted to more than half of the 2008 debt of businesses and households in Ireland. (*Gross* cross-border bank liabilities (dotted green line) considerably exceed *net* liabilities because banks in Ireland channelled credit abroad.)

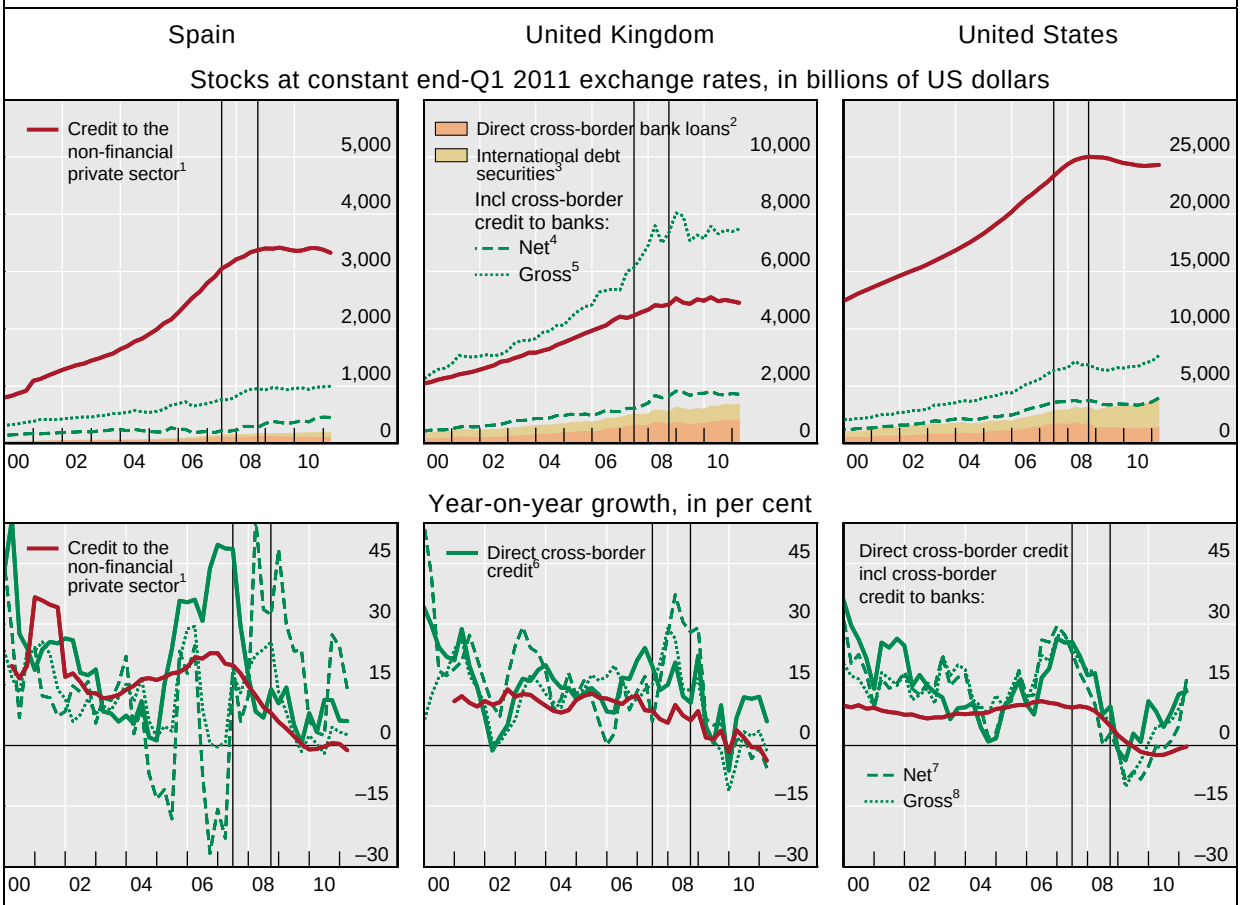
In contrast to Ireland, where the direct cross-border component loomed large, the indirect one dominated in the Baltic states. There, foreign-owned banks won very high market shares by borrowing euros in London and

funnelling the proceeds to their Baltic subsidiaries, which in turn extended euro-denominated loans to households and businesses (Graph 2, right-hand panels). Hungary (Graph 2, centre panels) represents an intermediate case: both direct cross-border lending to businesses and inter-office funding of foreign currency mortgages extended by local subsidiaries were important.

... and also in large economies

During credit booms, external sources of credit can gain importance in large economies as well as small ones. The Spanish, UK and US economies experienced a relatively rapid growth of cross-border credit (Graph 3, bottom panels) during their pre-crisis credit booms. In these large economies, the cross-border fraction of total credit is much lower, no more than 10–25%. (As in Ireland, the very large gross cross-border liabilities of banks in the United Kingdom, which actually exceed total credit to households and businesses, arise from the country's status as an international financial centre.)

Credit to the non-financial private sector in selected advanced countries



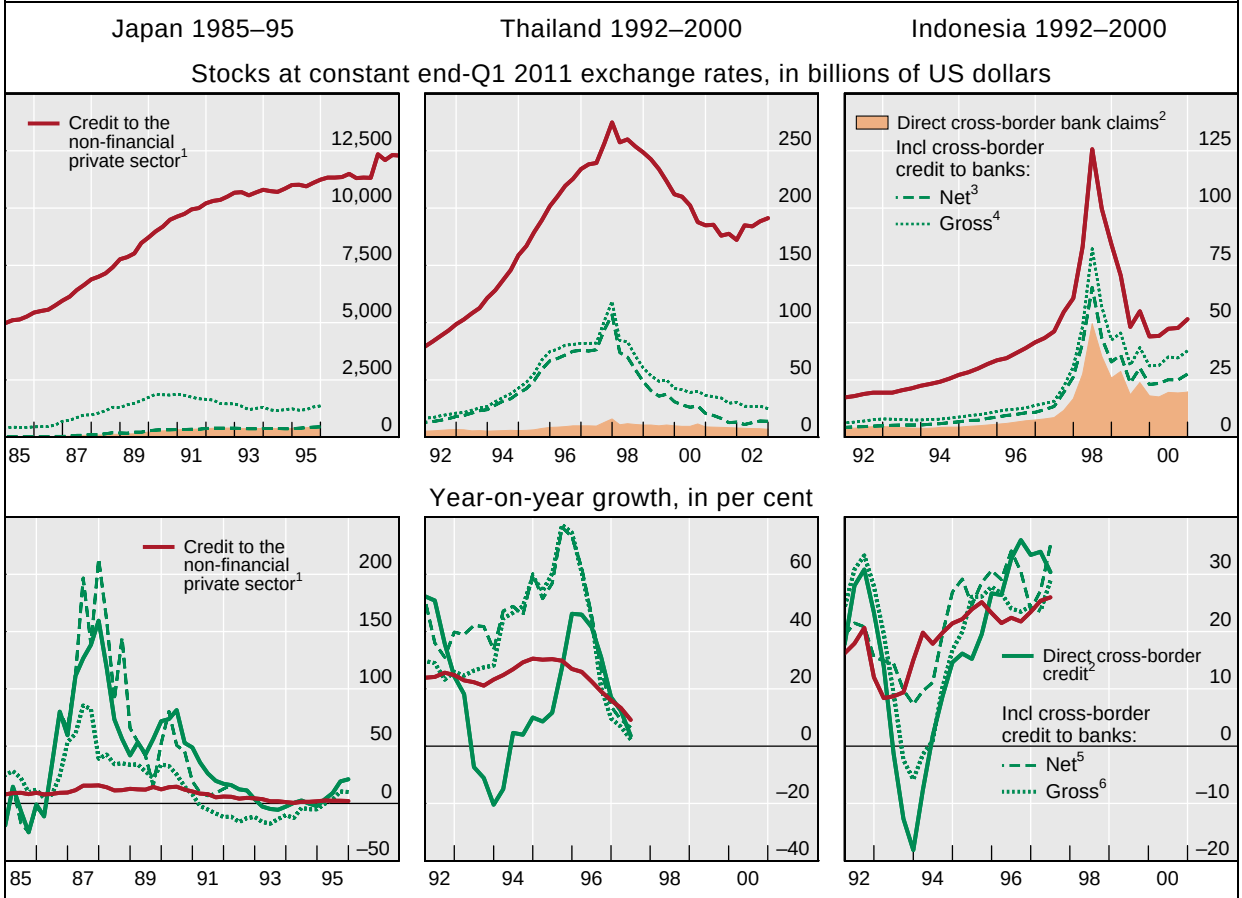
The vertical lines indicate end-Q2 2007 and end-Q3 2008.

[1] Total liabilities of non-financial private sector borrowers, as reported in the flow of funds statistics. [2] BIS reporting banks' direct cross-border loans to *non-banks* (ie includes loans to non-bank financial entities). [3] Issues of international debt securities by non-financial private sector residents of the country. [4] Net cross-border borrowing (liabilities minus claims) from all sectors by banks located in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). [5] Gross cross-border borrowing from all sectors by banks located in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). [6] Sum of cross-border loans and international debt securities outstanding. [7] Including net cross-border borrowing (if positive) by banks in the country, on the assumption that this cross-border credit is passed on to non-banks in the country. [8] Including gross cross-border borrowing by banks in the country.

Sources: IMF, *International Financial Statistics*; BIS locational banking statistics; BIS international debt securities statistics. Graph 3

The earlier credit booms in Asian economies displayed the same regularity. Japan in the 1980s and Thailand and Indonesia in the 1990s also saw cross-border credit growth outpace overall credit growth to the private sector (Graph 4). Again, cross-border credit was relatively small in the largest economy, Japan. But in Thailand and Indonesia, the cross-border components of credit were very substantial. Differences in the composition of cross-border credit in Thailand and Indonesia reflected regulatory differences. In Thailand, tax and other policy sought to establish Bangkok as a financial centre but only succeeded in favouring interbank inflows (dashed green line in Graph 4, top centre panel) that funded domestic dollar lending. By contrast, in Indonesia

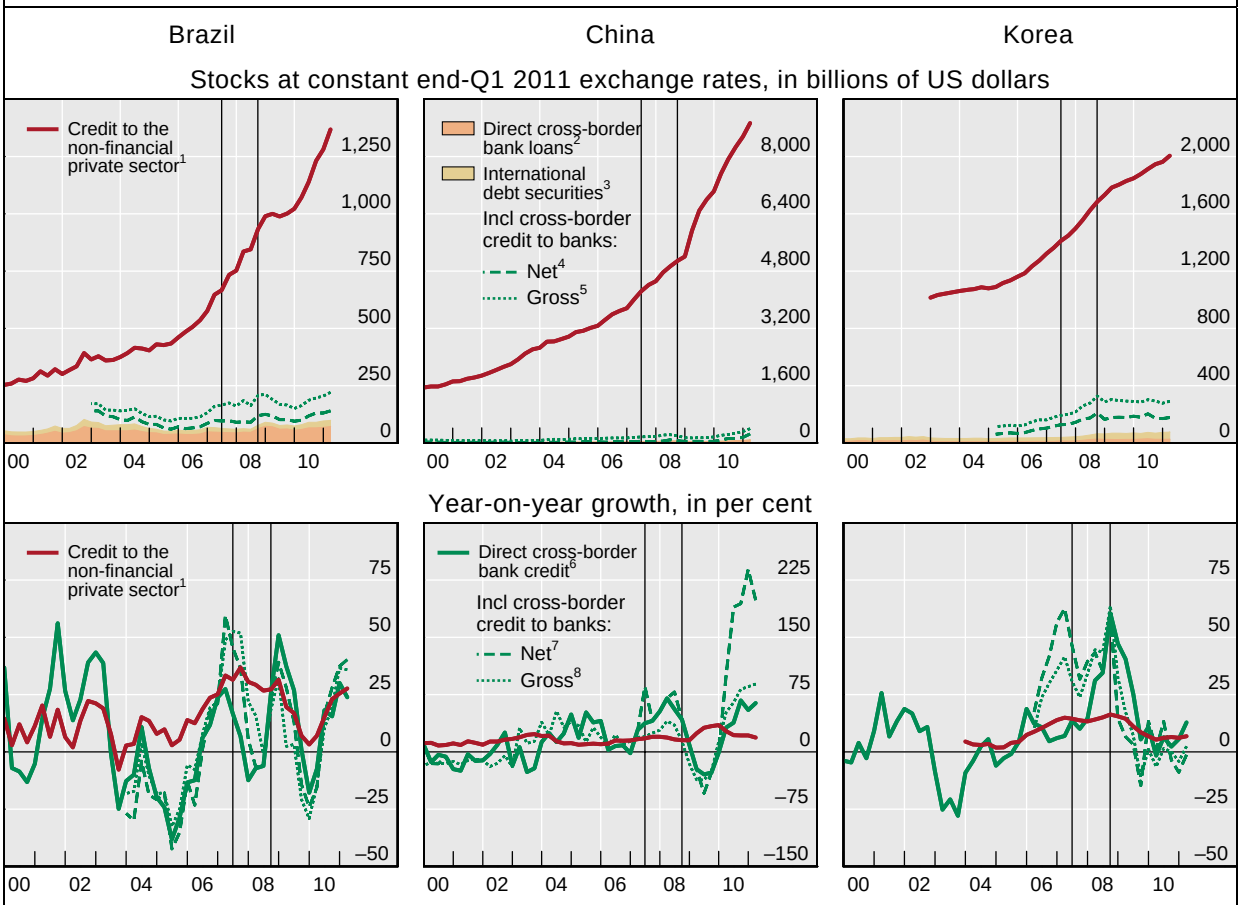
Credit to the non-financial private sector: Asia in the 1990s



[1] Domestic credit to non-financial private sector residents plus BIS reporting banks' cross-border claims (loans and securities) on non-bank residents of the country minus BIS reporting banks' consolidated international claims on the public sector in the country. Note that international claims on the public sector include cross-border claims plus locally extended claims in foreign currencies, although the latter are likely to be small. [2] For Japan, BIS reporting banks' direct cross-border claims (loans and securities) on *non-banks* (ie includes loans to non-bank financial entities and governments). For Indonesia and Thailand, BIS reporting banks' international claims on the public sector are subtracted from this total. [3] For Japan, net cross-border borrowing (liabilities minus claims) if positive from all sectors by banks located in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). For non-BIS reporting countries (Indonesia and Thailand), BIS reporting banks' net cross-border claims on banks in the country are used. [4] For Japan, gross cross-border borrowing from all sectors by banks located in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). For non-BIS reporting countries (Indonesia and Thailand), BIS reporting banks' gross cross-border claims on banks in the country are used. [5] Cross-border claims plus net cross-border borrowing (if positive) by banks in the country, on the assumption that this cross-border credit is passed on to non-banks in the country. [6] Cross-border claims plus gross cross-border borrowing by banks in the country.

Sources: IMF, *International Financial Statistics*; BIS locational banking statistics; BIS consolidated banking statistics. Graph 4

Credit to the non-financial private sector in selected emerging economies



The vertical lines indicate end-Q2 2007 and end-Q3 2008.

[1] For Korea, total liabilities of non-financial private sector borrowers, as reported in the flow of funds statistics. For others, domestic credit to non-financial private sector borrowers plus cross-border loans to *non-banks* (ie includes loans to non-bank financial entities) plus issues of international debt securities by non-financial private sector borrowers in the country. [2] BIS reporting banks' direct cross-border loans to *non-banks* (ie includes loans to non-bank financial entities). [3] Issues of international debt securities by non-financial private sector residents of the country. [4] BIS reporting banks' net cross-border claims on banks in the country plus direct cross-border bank loans (orange shaded area) plus outstanding international debt securities (tan shaded area). [5] BIS reporting banks' gross cross-border claims on banks in the country are used. [6] Sum of cross-border loans and international debt securities outstanding. [7] Including net cross-border borrowing (if positive) by banks in the country, on the assumption that this cross-border credit is passed on to non-banks in the country. [8] Including gross cross-border borrowing by banks in the country.

Sources: IMF, *International Financial Statistics;* BIS locational banking statistics; BIS international debt securities statistics. Graph 5

regulation limited resident banks' ability to lend foreign currency to local firms, so foreign banks lent directly to them from outside the country (shaded area in Graph 4, top right-hand panel).

Current cause for concern?

The same pattern threatens to emerge in some countries today (Graph 5). Credit has grown rapidly in Brazil and China since the crisis, with cross-border credit growing even more quickly for some quarters. Notably, this has occurred despite various restrictions that limit international financial integration in general, and the inflow of foreign currency into the local banks in particular. In Korea, for its part, following the trauma of international banks' withdrawing $56 billion in the fourth quarter of 2008, policies to prevent the build-up of short-term cross-border interbank debt (Baba and Shim (2010)) have been associated with more moderate overall credit growth.

Constructing currency-specific and country-specific credit aggregates

This special feature presents global credit aggregates for key currencies and aggregates for specific countries that juxtapose total credit with its cross-border components. BIS data are useful in removing foreign currency credit from the national flow of funds statistics for the United States, the euro area and Japan, as well as in constructing the international components of credit for individual countries.

Global currency-specific credit aggregates

To construct global credit aggregates in key currencies, we start with the total debt of *non-financial* residents (separately showing private and government borrowers) from the US, euro area and Japanese flow of funds statistics. To this we add the dollar/euro/yen debt of non-financial borrowers resident outside the United States/euro area/Japan. We adjust the national flow of funds total downwards by any identified foreign currency debt. For credit to US residents, our adjustment is limited to purging the BIS cross-border *non-dollar* loans to US non-banks and the *non-dollar* international bonds of US non-financial issuers.[①] For the euro area and Japan, we also purge foreign currency credit to residents extended by the domestic banking system. These exclusions reduce the US, euro area and Japanese flow of funds totals by 1%, 5% and 0.4%, respectively.

To construct the stock of credit to the rest of the world, for each currency, we aggregate cross-border bank loans to non-banks, locally extended loans to non-banks, and outstanding international bonds issued by non-financial borrowers. For instance, we sum dollar loans to UK non-banks booked in France and the United Kingdom and dollar bonds issued by UK non-financial firms.

An issue arises with consolidation across banks or financial firms more broadly. To be strictly comparable with the national flow of funds statistics, we would need to exclude bank loans to *non-bank financial* firms (finance companies, insurers, etc) *and* to include such non-bank financial firms' loans to businesses and households. However, BIS international banking data allow us to exclude only the bank loans to banks. By contrast, the BIS international securities data allow us to exclude all financial issuers. While this approach aligns our debt aggregates as closely as possible with the national flow of funds, we understate credit in the given currency to the rest of world if bank loans to non-bank financial firms fall short of the non-bank financial firms' loans to businesses and households. If we were to exclude only the dollar (euro or yen) debt securities of banks, rather than those of all financial issuers, we would add another $1.6 trillion (€332 billion or ¥15 trillion).

An issue also arises with the use of currency derivatives. We *understate* dollar/euro/yen credit to the rest of the world if non-financial firms there use derivatives to transform local currency debt into dollars, euros or yen. For instance, Korean shipbuilders seek to lock in profits on dollar-invoiced exports by hedging the dollar/won rate. One approach is to issue a dollar bond, which would be captured in our aggregate, and immediately to sell the dollars against won. Another approach is to contract to sell dollars forward against won, effectively converting existing won debt into US dollar debt, which would not be captured in our dollar aggregate. Likewise, if non-financial firms in the rest of the world systematically enter cross-currency swaps with financial firms to transform domestic debt into dollars, euros or yen, then we also understate dollar, euro or yen debt.

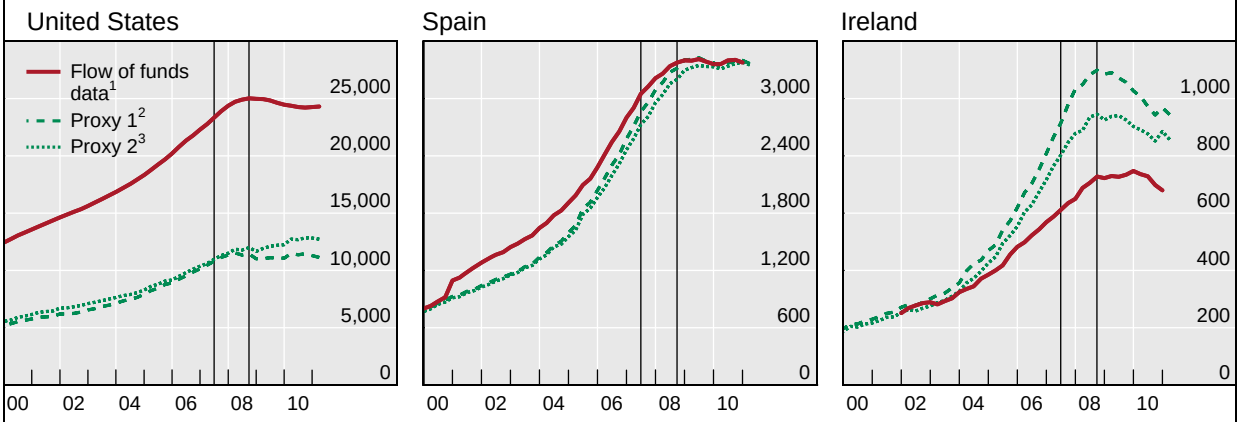
Country-specific credit aggregates

In the country-specific graphs, we juxtapose national flow of funds data (here, debt of non-financial *private sector* borrowers only), which in principle should include the international components of credit, with these components.[②] We focus on cross-border credit extension at *origination*, ie on the residence of those extending the *initial financing in the primary markets*. Such credit provides new funding for the credit boom, while, by contrast, the purchase by non-residents of an asset in the secondary market simply changes the ownership of an existing claim (see below).

Distinguishing international bonds from domestic bonds is not without difficulty, but alternative estimates of cross-border credit tell much the same story. The BIS international debt securities data capture primary market foreign currency bonds issued in a given country (eg dollar bonds in London, dubbed "eurodollar" bonds) and domestic currency bonds issued in the domestic market by non-residents ("foreign" bonds). In addition, domestic currency issues in the domestic market by residents are also counted as international issues if they are specifically targeted at non-resident investors. Such targeting is not easy to capture in practice. However, the results in Graphs 2–5 in the main text carry through with an alternative estimate based on banks' cross-border holdings of debt securities (see the two green lines in Graph A).

Credit to the non-financial private sector

At constant end-Q1 2011 exchange rates, in billions of US dollars



The vertical lines indicate end-Q2 2007 and end-Q3 2008.

[1] Total liabilities of non-financial private sector borrowers, as reported in the flow of funds statistics. [2] Domestic credit to non-financial private sector residents plus BIS reporting banks' claims (loans and securities) on non-bank residents of the country minus BIS reporting banks' consolidated international claims on the public sector in the country. Note that international claims on the public sector include cross-border claims plus locally extended claims in foreign currencies, although the latter are likely to be small. [3] Domestic credit to non-financial private sector residents plus BIS reporting banks' cross-border *loans* to non-banks to non-bank residents of the country plus outstanding international debt securities issued by non-financial private sector residents of the country.

Sources: IMF, *International Financial Statistics*; national data; BIS locational banking statistics; BIS consolidated banking statistics (immediate borrower basis); BIS international debt securities statistics. Graph A

Not all countries have comprehensive flow of funds statistics and hence a measure of *total* credit to non-financial private sector borrowers. For Brazil, China and Thailand, we construct proxies for total credit to non-financial private sector borrowers using domestic credit extended by the country's banking system, supplemented with BIS data.

Judging from three advanced economies that produce flow of funds, our proxies work best in bank-dominated financial systems. Graph A juxtaposes total credit to non-financial private sector borrowers from the flow of funds with two proxies constructed from national and BIS data. The first of these proxies is simply total credit (ie loans and holdings of securities) provided by banks (either in the country or abroad). The second is a combination of loans from banks and outstanding international bonds, which corresponds most closely to the concept of origination and is thus our preferred measure. In a financial system with well developed private bond markets (eg the United States, left-hand panel), our proxies fall well short of flow of funds totals. This reflects the significant provision of credit by finance companies and institutional bond investors. In contrast, in a low-tax economy with many non-bank financing subsidiaries as in Ireland (right-hand panel), our bank credit proxies overstate total borrowing: as mentioned above, the BIS banking data include credit to non-bank financial borrowers. In bank-centred financial systems, like that of Spain (centre panel), our proxies match the flow of funds measure well. The role of banks in the financial systems of emerging economies, such as those of China or Brazil, probably most resembles the Spanish case.

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① For this to be strictly correct, BIS data would have to distinguish between financial and non-financial counterparties to match the flow of funds data, not bank and non-bank. ② Whether in practice the national flow of funds data actually include credit extended to residents from outside the country is an open question. The United States illustrates this measurement challenge: the US flow of funds statistics may have understated the scale of offshore lending to US households and businesses in the years to 2007. While BIS statistics show that loans booked offshore to US non-banks peaked at more than $1.4 trillion, the US flow of funds shows an amount of foreign loans to non-financial businesses that is an order of magnitude smaller. To be sure, the BIS aggregate includes loans to non-bank financial firms. Still, if the US flow of funds missed a substantial sum of direct loans to non-financial corporations and partnerships, then business credit grew even faster in the boom. For an earlier analysis, see McCauley and Seth (1992).

The swelling of cross-border sources of credit during credit booms observed in most of these cases may reflect a broader regularity, namely the growing importance of wholesale funding during booms. The ratio of credit to retail deposits, and more generally to money, tends to increase during these episodes. As credit expansion outpaces the growth of retail deposits, credit intermediaries turn increasingly to wholesale funding.[6] And external sources loom large here, whether direct cross-border lending or interbank lending.[7]

Policy implications

The international dimension of credit poses significant policy challenges. Here we consider, in particular, how it may limit the ability of the authorities to monitor or constrain credit and, ultimately, to insulate their economies from the undesirable effects of low interest rates elsewhere.

It is often argued that countries experiencing strong capital inflows can insulate themselves by allowing their exchange rate to appreciate. A stronger exchange rate can no doubt reduce inflationary pressures and, to the extent that it reduces exports, dampen final demand. However, its restraining effect on the credit boom is less obvious, especially if the debt is denominated in foreign currency.

Can exchange rate appreciation insulate an economy from international credit?

There are at least four reasons for this. First, as the domestic currency appreciates, it reduces the debt and cash flow burden of credit denominated in foreign currency, seemingly creating room for more borrowing. Second, if both borrowers and lenders have extrapolative expectations,[8] borrowers may denominate more of their debt in foreign currency, while lenders may anticipate a further strengthening of their customers' creditworthiness. Third, as long as this process continues, it puts further upward pressure on the currency. As domestic firms and households switch from borrowing in domestic to borrowing in foreign currency, they reduce the supply of assets denominated in domestic currency. If investors treat domestic and foreign currency assets as imperfect substitutes in their portfolios, this requires the domestic currency to appreciate.[9] Finally, foreign borrowing and monetary policy can interact

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[6] Why this wedge? Recall that credit and asset price booms reinforce each other, as collateral values and leverage increase. As a result, credit tends to grow fast alongside asset prices. By contrast, opposing forces work on the relationship between money and asset prices. Increases in wealth tend to raise the demand for money (wealth effect). However, higher expected returns on risky assets, such as equity and real estate, as well as a greater appetite for risk, induce a shift away from money towards riskier assets (substitution effect). This restrains the rise in the demand for money relative to the expansion in credit. See Borio and Lowe (2004).

[7] Wholesale funding, including that from abroad, enables less established lenders, with limited access to a retail deposit base, to gain market share during such booms. Examples include finance companies in the Nordic countries and Japan ("jusen") in the late 1980s and the shadow banking system in the United States in the 2000s.

[8] Such expectations are not necessarily irrational: uncovered interest parity may not hold over extended periods.

[9] Admittedly, in large emerging markets, foreign currency credit can be rather small in relation to domestic credit. However, foreign currency borrowing can still be quite large in relation to

perversely, as raising domestic policy interest rates may induce further switches into foreign currency debt, which is perceived as cheaper (Brzoza-Brzezina et al (2010)). To be sure, this process would come to an end once expectations changed from further currency appreciation to depreciation. But the required appreciation may be too costly for policymakers to tolerate, as it could be very sizeable and persistent.

More generally, the use of international currencies outside their borders means that the policies of the home monetary authorities have a direct influence on financial conditions in other jurisdictions. This constrains the room for manoeuvre of countries whose residents denominate a significant fraction of their debt (and assets) in foreign currency.

That said, our findings indicate that the contribution of foreign-currency or cross-border lending varies substantially across economies, and it is not that high for some of the larger ones. At least for these, the impact of international factors on domestic financial conditions may operate more through prices than quantities. In particular, the contribution of the international components to domestic credit booms may matter less than the response of monetary policy to exchange rate appreciation and the impact of capital flows on asset prices more generally.

Can the monitoring of international credit be improved?

Monitoring international credit stocks allows policymakers to assess their impact and to calibrate a response. However, monitoring direct cross-border credit, which is not channelled through the domestic banking system, presents challenges. Non-bank borrowers rarely report debts booked abroad accurately, and national reporting systems resist using data produced by others. Domestic reporting systems struggle to measure such debt, even in the presence of controls or required registration. Our analysis suggests that authorities could use BIS statistics to cross-check estimates of their residents' international debt, especially that owed by businesses directly to banks abroad.

There is also a daunting control challenge in the face of a credit boom. Imagine that the prudential authorities wish to tighten standards, such as loan-to-value ratios or minimum capital requirements, in order to protect the banking system from a credit boom (and possibly to restrain the boom). Tightening the standards induces circumvention, by encouraging direct cross-border lending. For example, US dollar loans booked by banks in Japan and by Japanese banks outside Japan shot up in the late 1980s to avoid the Bank of Japan's window guidance (restraints) on domestic yen lending (Fukumoto et al (2010)). Moreover, concerns that they might put their banks at a competitive disadvantage could inhibit the authorities from tightening in the first place.[10] Addressing this challenge calls for international coordination. But the supervisors of the foreign banks ("home" supervisors) may have little incentive to act if large multinational banks have relatively small exposures to the booming economy.

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the foreign exchange market at early stages of financial development, and can therefore exert an outsize effect on the exchange rate.

[10] This issue can also arise with respect to credit extended locally by foreign bank branches, rather than subsidiaries, since the local authorities may not have the ability to constrain them.

Can credit growth be constrained without putting domestic banks at a disadvantage?

The countercyclical capital buffer in Basel III addresses these challenges (BCBS (2010)). First, all the home authorities have agreed to apply the buffer (up to 2.5% of risk-weighted assets) to their multinational banks' exposures to the foreign ("host") jurisdictions. Second, the host authority can invoke the buffer in response to signs of a build-up of credit risks in its jurisdiction, with unusually strong credit booms acting as an agreed point of reference; home authorities may enforce thicker, but never thinner, buffers. This design can protect banks from credit cycles outside the home country, help to constrain credit booms, and address incentive and circumvention challenges.[11] This multilateral agreement might well serve as a model for the international coordination of macroprudential policy to mitigate the risks of credit booms (eg using loan-to-value ratios).

Conclusion

In globalised financial markets, it is crucial to understand the international dimension of credit. Building on previous work and combining the BIS international financial statistics and national sources, this special feature has sought to measure foreign currency and cross-border credit and to identify patterns in their behaviour, both in the aggregate and in individual countries.

For some key currencies, particularly the US dollar and, to a lesser extent, the euro, the domain of use extends well beyond the borders of the issuing jurisdiction. In larger countries, the stock of credit in foreign currency tends to be modest in relation to overall credit, but it can grow in an unwelcome fashion at times like these. In addition, cross-border credit bears watching because it has tended to grow faster than overall credit in many countries experiencing credit booms.

Further work in this area will become possible as emerging markets expand the coverage of their own credit aggregates, for example through the development of flow of funds statistics. The geography of global credit remains only partly mapped.

[11] That said, the scheme is by no means foolproof. For example, supervisors will need to guard against banks collaborating with borrowers to book loans to borrowers' financing subsidiaries outside the country to whose residents the countercyclical capital buffer has been applied.

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The rise of sovereign credit risk: implications for financial stability[1]

The financial crisis and economic recession, and policymakers' responses to these events, have raised sovereign risk concerns in a number of advanced economies. This has increased the cost and reduced the stability of funding for banks. It has also meant that decisions about the maturity of government debt have become important to the dynamics of systemic financial distress. This article looks at the financial stability issues involved, drawing from two recent studies by the Committee on the Global Financial System (CGFS). A return to sustainable government finances over the medium term is fundamental to managing current difficulties. Banks improving their funding and asset risk management, lengthening of government debt maturities and sound banking regulation are also important. And the different policy agencies involved need to ensure that they are aware of each other's objectives and operational plans, while maintaining clear lines of accountability.

JEL classification: E58, E60, E61, G21.

The financial crisis and global recession, and policymakers' responses to these events, have had significant, and probably long-lasting, effects on the global economy and financial markets. Markedly reduced growth prospects and sharply increased public debt in several advanced countries have heightened concerns about sovereign credit and liquidity risk, posing a considerable challenge to banking systems and financial stability. These developments, together with very low short-term interest rates and large-scale purchases of assets (including sovereign debt) as instruments of monetary policy, have also increased the interactions between sovereign debt management (SDM) and central banking.

Two important questions in the current policy debate are: (i) how sovereign risk is affecting bank funding conditions; and (ii) how sovereign debt management choices, about maturity in particular, can affect monetary and financial conditions and the propagation of financial stress more generally.

[1] The analysis in this article is based on data available up to June. See pages 1–13 for subsequent events in sovereign bond markets. The views expressed here are those of the authors, and not necessarily those of the CGFS or the BIS. We are grateful to Claudio Borio, Maria Canelli, Stephen Cecchetti, Dietrich Domanski, Ingo Fender, Paul Fisher, Fabio Panetta, Philip Turner and Christian Upper for useful comments on earlier drafts of this article, and to Gabriele Gasperini for able research assistance.

These questions were part of two recent in-depth studies by the Committee on the Global Financial System (CGFS).[2] This article discusses the key findings. More detail is available in the published reports (CGFS (2011a, 2011b)).[3]

In the first section of this article, we discuss the rise of sovereign risk in advanced countries. In the second, we explain its negative impact on bank funding conditions. The third section examines how sovereign debt management choices about maturity have become more important under the current strained circumstances. Lastly, we discuss some implications for banks and policymakers.

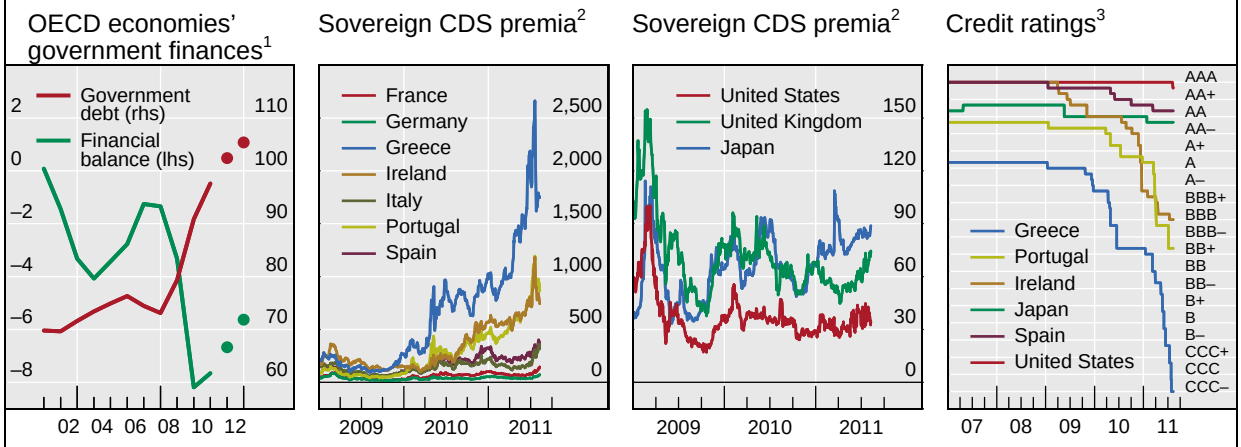
The rise of sovereign risk in advanced countries

Public finances are under significant pressure in many advanced countries

The financial crisis and global economic downturn have put significant pressure on public finances in several advanced economies. Fiscal deficits have widened markedly, reflecting the effects of automatic stabilisers, discretionary stimulus measures and official sector support to the financial sector. Between end-2007 and end-2010, average budget deficits in OECD countries increased from 1% to 8% of GDP and gross government debt rose from 73% to 97% of GDP (Graph 1, left-hand panel).

Sovereign debt stress has been particularly acute in the euro area. Greece, Ireland and Portugal received international official assistance after they were unable to raise funding without offering unsustainably high interest

Indicators of advanced countries' fiscal positions



[1] OECD members aggregates; as a percentage of GDP. The financial balance is the headline surplus or deficit, including one-off items. Data for 2011 and 2012 are forecasts. [2] Five-year on-the-run CDS spreads, in basis points. [3] Average of Fitch, Moody's and Standard & Poor's foreign currency long-term sovereign ratings.

Sources: OECD; Bloomberg; Markit. Graph 1

[2] The CGFS is a central bank forum that monitors broad issues relating to financial markets and systems and develops appropriate policy recommendations. The CGFS places particular emphasis on assisting Governors in recognising, analysing and responding to threats to the stability of financial markets and the global financial system.

[3] The report on *The impact of sovereign risk on bank funding conditions* was prepared by a Study Group chaired by Fabio Panetta (Bank of Italy). The report on *Interactions of sovereign debt management with monetary conditions and financial stability* was prepared by a Study Group chaired by Paul Fisher (Bank of England). Both reports are available at www.bis.org/list/cgfs/index.htm.

rates. Some other countries have seen their debt spreads increase significantly as a result of investor concerns about their fiscal conditions (Graph 1, second panel from left).

The resulting higher sovereign risk could persist for some time

Without credible plans to restore long-term fiscal sustainability, sovereign debt in several euro area and other advanced countries may no longer be regarded as having zero credit risk. Japan and the United States were downgraded in 2011, but, to date, their sovereign CDS premia have not risen materially (Graph 1, third and fourth panels from left). And in many advanced economies, government debt levels are expected to continue to rise over coming years, due to high fiscal deficits and rising pension and health care costs. Moreover, the level of economic output, which underpins debt servicing capacity, is unlikely to return to its pre-crisis trend any time soon.[4] Sovereign risk premia could thus be persistently higher and more volatile in the future.

Impact of sovereign risk on bank funding

While financial institutions have always needed to contend with market risk on sovereign debt due to changing interest rate expectations, sovereign credit risk and its implications now pose a significant and urgent challenge to banks.[5] These challenges are particularly acute when it is a bank's home sovereign that is in distress.[6] A deterioration in sovereign creditworthiness drives up banks' funding costs and impairs their market access through multiple channels (see below). Moreover, due to the extensive role of government securities in the financial system, banks cannot fully insulate themselves from higher sovereign risk by changing their operations.

Heightened sovereign risk negatively affects banks' funding …

The rise in sovereign risk since late 2009 has increased the cost of banks' funding, and in some cases reduced their market access. The extent of the impact on banks is broadly in line with the perceived deterioration in the creditworthiness of the home sovereign. Banks from Greece, Ireland and Portugal have seen their CDS premia rise to extremely high levels, their issuance of short-term wholesale debt fall sharply and, in two cases, their deposits drain (Graph 2).[7] As a result, they have become much more reliant on central bank liquidity. The increase in the cost of wholesale funding has spilled over to other European banks, although to a much lesser extent. Banks in other

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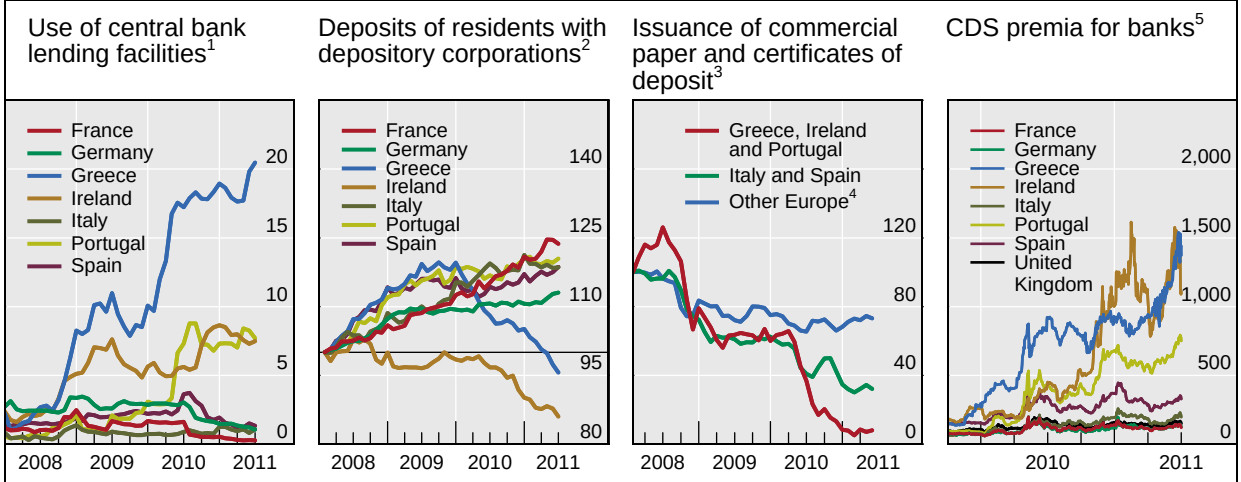
[4] History shows that systemic banking crises often cause long-lasting, possibly permanent output losses relative to trend. In the current period, the destruction of human capital due to long-term unemployment, and the need to shrink the finance and construction sectors in some economies, may weigh on economic growth for years to come (BIS (2011)).

[5] Some implications for insurance companies and pension funds are discussed in another recent CGFS report (CGFS (2011c).

[6] The home sovereign refers to the country in which the bank is headquartered.

[7] The driver of the increase in sovereign risk differs across these countries – for example, in Greece the financial crisis has exacerbated an already weak fiscal position, while in Ireland the government's fiscal position was considered strong before the crisis but has been severely affected by the cost of supporting banks. Nonetheless, even where the original causality went from banks to the sovereign, sovereign risk has reached the point where it is compounding the problems in the banking sector.

Indicators of bank funding pressures



[1] Central bank loans as a share of total bank assets; in per cent. [2] Excludes deposits with central banks and other financial institutions; adjusted for securitisation; January 2008 = 100. [3] In the United States and euro markets. End-of-month outstanding stock; January 2008 = 100. [4] Includes the United Kingdom. [5] For each country, the simple average of five-year CDS premia on senior bonds issued by the major banks.

Sources: ECB; Depository Trust & Clearing Corporation; Dealogic; Datastream; Bloomberg, BIS estimates. Graph 2

major advanced economies have experienced only modest changes in their wholesale funding costs.

Channels through which sovereign risk affects bank funding conditions

… through several different channels …

There are four main channels through which a deterioration in sovereign creditworthiness adversely affects banks' funding costs and market access: direct losses on sovereign holdings, lower collateral values for wholesale and central bank funding, reduced funding benefits from government guarantees and depressed bank credit ratings.[8]

… such as direct balance sheet losses …

First, increases in sovereign risk cause losses on banks' government bond holdings, thereby weakening their balance sheets. A decrease in the creditworthiness of the home sovereign is particularly damaging, as banks often have large exposures to them (Graph 3, left-hand panel). Banks also typically have a strong home bias in their sovereign portfolios – for example, European banks' domestic sovereign holdings (as a share of their total EU sovereign holdings) are many times larger than their home country's share of aggregate sovereign debt in the EU (Graph 3, centre panel). The available data suggest that banks also hold significant quantities of debt issued by foreign sovereigns – exposures to the public sector in foreign countries are largest for Swiss, Belgian and Canadian banks (Graph 3, right-hand panel). Foreign (on-balance sheet) claims on the public sectors of countries most severely affected by the current sovereign debt tensions are significantly smaller, but sometimes non-negligible. Relatedly, increases in sovereign risk can also depress the mark to market value of banks' OTC derivatives positions with the

[8] The CGFS report on the impact of sovereign risk on bank funding conditions also briefly examines other potential channels of contagion from sovereigns to banks, such as investors' risk aversion, banks' non-interest income and international spillovers (CGFS (2011b)).

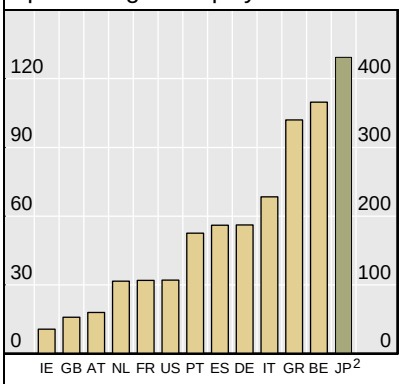
affected sovereigns.[9] Anecdotal evidence suggests that these positions are sizeable.

... reduced collateral for wholesale funding ...

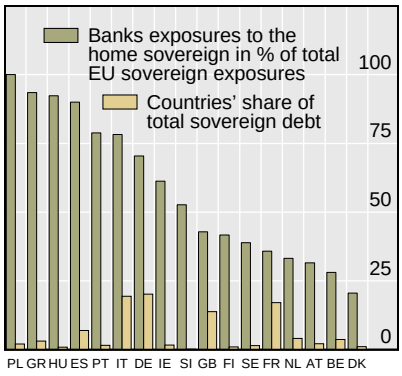
Second, falls in the market prices of sovereign bonds due to a deterioration in sovereign creditworthiness reduce the value of the collateral that banks can use to secure wholesale funding, and can trigger margin calls from counterparties. In private repo markets, sovereign debt accounts for the majority of collateral, and participants are sensitive to changes in its riskiness. Ratings downgrades, if large enough, can exclude a government's bonds from the pool of eligible collateral. Also, counterparties may materially increase the haircuts applied to sovereign securities.[10] During the current sovereign debt crisis in the euro area, the share of transactions in European repo markets collateralised by Greek, Irish and Portuguese government bonds in the second

Banks' exposures to domestic and foreign public sectors

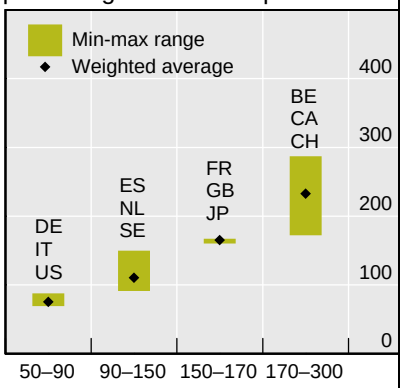
Banks' exposures to the domestic sovereign as a percentage of equity[1]



Concentration of banks' EU sovereign portfolios[3]



Banks' exposures to public sectors of all foreign countries as a percentage of Tier 1 capital[4]



AT = Austria; BE = Belgium; CA = Canada; CH = Switzerland; DE = Germany; DK = Denmark; ES = Spain; FI = Finland; FR = France; GB = United Kingdom; GR = Greece; HU = Hungary; IE = Ireland; IT = Italy; JP = Japan; NL = the Netherlands; PL = Poland; PT = Portugal; SE = Sweden; SI = Slovenia; US = United States.

[1] Data are from national central banks, as of end-2010, and are on a locational basis, for banks *resident* in each country. The definition of bank equity is an accounting one, which differs somewhat across countries. The data for Dutch banks are sourced from the CEBS EU-wide stress tests. The data for Austria are as at end-2009. [2] Right-hand scale. [3] In per cent. Data are from the EBA EU-wide stress tests, as of end-December 2010, and are on a globally consolidated basis, for banks *headquartered* in each country. Banks' exposures to their home sovereign (dark-coloured bars) are shown as a percentage of their total exposures to the 27 EU sovereigns. The lighter coloured bars show each country's share of outstanding EU sovereign debt. [4] Bank nationalities are grouped in "buckets", based on the size of their exposure. Data are as at December 2010, on an ultimate risk basis, except for German banks, which are on an immediate borrower basis.

Sources: Bolton and Jeanne (2011); CEBS; EBA; national data; BIS consolidated banking statistics. Graph 3

[9] Banks record OTC derivatives transactions that have a positive market value at a lower than face value on their balance sheets to reflect the counterparty risk inherent in these positions (this is referred to as credit valuation adjustment (CVA)). Increases in sovereign risk result in higher CVAs and a reduction in the market value of banks' derivatives transactions, and are reported as mark to market losses on the banks' income statements. The impact on banks is most severe when sovereigns use unilateral credit support annexes, rather than bilateral ones.

[10] Sovereign bonds usually have minimal haircuts, reflecting their low perceived credit risk, high liquidity and ease of valuation.

half of 2010 was less than half that in 2009, and market haircuts have risen to very high levels.[11]

Sovereign debt is also widely used as collateral in central bank operations. The share of sovereign bonds in total collateral ranges from about 15% in the euro area and United States, to 70% in the United Kingdom and 95% in Japan. Over the past two years, banks from Greece, Ireland and Portugal have increased their use of Eurosystem liquidity and made greater use of domestic government bonds to collateralise this funding. This was permitted by modifications to the Eurosystem collateral rules.[12] This Eurosystem funding was important in easing funding pressures on banks, and prevented a severe credit crunch in the affected countries, but has transferred credit risk to central banks.

… and reduced funding benefits and credit ratings

Third, a deterioration in the creditworthiness of the sovereign reduces the funding benefits that banks derive from government guarantees, be they explicit or perceived.[13] Rating agencies' assessment of the value of implicit support provided to banks by the weaker euro area countries has decreased noticeably since late 2009 to low levels; for instance, it has fallen by eight notches for Ireland and two to three notches for Portugal (Graph 4, left-hand panel).[14] However, for the major advanced economies in Europe and elsewhere, the level of implicit support is little changed.[15] Similarly, the value of explicit government support for banks (measured by the spread between the yields on a bank's government-guaranteed and non-guaranteed senior bonds) tends to be higher in triple-A rated countries, such as Germany and the United Kingdom, than in non-AAA countries.

Fourth, sovereign downgrades often flow through to lower ratings for domestic banks, thereby raising their wholesale funding costs and possibly reducing their market access. This is because banks are more likely than other sectors to be affected by sovereign distress. Only 2% of domestic banks across seven non-AAA European countries had a credit rating that was higher than that of their respective sovereign at end-2010. Moreover, in five advanced

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[11] For instance, LCH.Clearnet, a leading European clearing house, had increased the haircuts on Irish and Portuguese government bonds to 75% and 65%, respectively, by June 2011.

[12] The Eurosystem suspended the application of the minimum credit rating threshold for securities issued or guaranteed by governments of countries that had obtained international financial support and adopted a fiscal consolidation plan approved by the European Commission and the IMF, in liaison with the ECB (ECB (2010, 2011a, 2011b)).

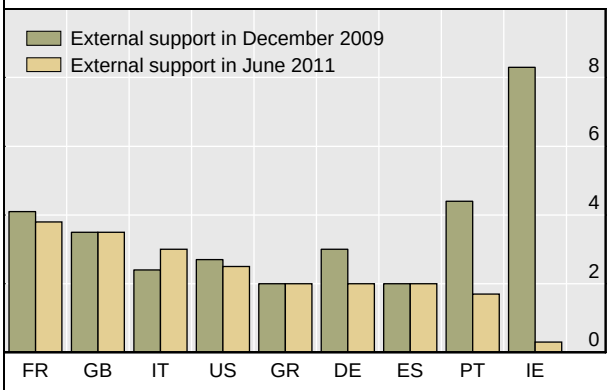
[13] These funding benefits can be sizeable (see the Vickers Report (ICB (2011)), Haldane (2010) and Baker and McArthur (2009)), and so their loss is always negative for banks. However, it is not necessarily negative for the economy as a whole.

[14] Implicit government support for banks is proxied by the difference between the "issuer rating" (the overall rating, which takes into account the likelihood of government or group support if a bank is in trouble) and the standalone rating, which reflects only the bank's intrinsic strength (Moody's (2007)).

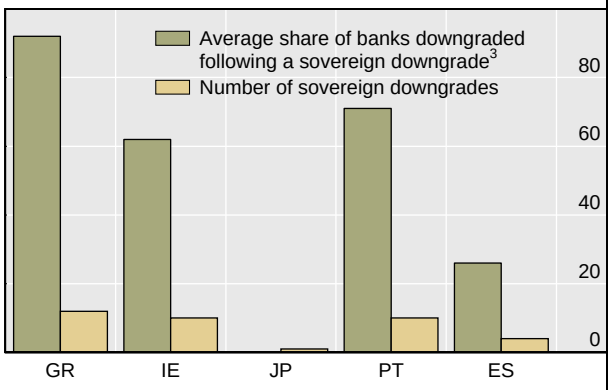
[15] Since mid-2007, the major advanced economies have generally increased their support for banks, as they tried to mitigate the impact of the financial crisis (CGFS (2011b)). See also Packer and Tarashev (2011) for a more detailed discussion of bank credit ratings and the role of government support.

Relationship between the credit ratings of sovereigns and banks

Level of external support for large banks[1]



Sovereign ratings downgrades since November 2009 and the effect on domestic banks[2]



DE = Germany; ES = Spain; FR = France; GB = United Kingdom; GR = Greece; IE = Ireland; IT = Italy; JP = Japan; PT = Portugal; US = United States.

[1] In credit ratings notches; as at 7 June 2011. Number of "large banks" included for each country: United States: 6; Italy: 5; United Kingdom and France: 4; Ireland, Portugal and Greece: 3; Germany and Spain: 2. [2] Data refer to foreign currency long-term ratings changes by Fitch, Moody's and Standard & Poor's. Domestic banks are defined as those whose ultimate parent company has its domicile in the same country as the sovereign. [3] Average share, across rating agencies, of domestic banks that experienced ratings downgrades within six months of the sovereign rating downgrade.

Sources: CGFS (2011b); Bloomberg; Moody's. Graph 4

countries that have experienced ratings downgrades since late 2009, two thirds of domestic banks have had their credit ratings lowered within the six months following a sovereign downgrade (Graph 4, right-hand panel). This relationship is strongest in countries where the sovereign has been downgraded significantly.

The role of sovereign debt management choices about maturity

Sovereign debt management choices affect sovereigns' liquidity risk

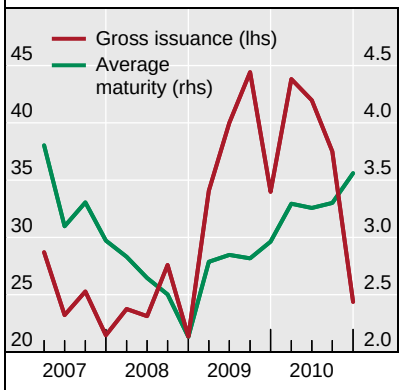
The impact of sovereign credit risk on the level and volatility of sovereign bond yields, and hence financial volatility more generally, can be exacerbated by SDM choices about maturity, which affect the sovereign's liquidity risk. Through their decisions about maturity and other features of government bonds, debt managers aim to minimise the medium- to long-term expected cost of funding the government's activities, subject to prudent risk management. The current environment has amplified the financial stability consequences of SDM decisions about maturity in particular.

During the crisis, the average maturity of new issues shortened materially

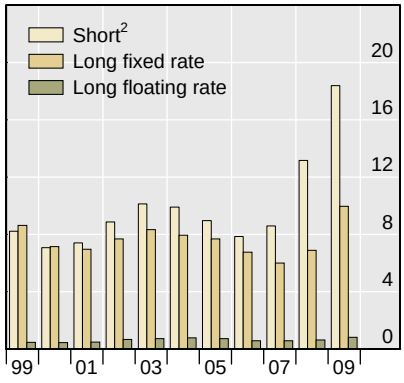
Sovereign debt managers appear to have been aware of the risk consequences of their choices as the global financial turmoil unfolded. The extreme market conditions and sudden funding needs for advanced country sovereign issuers that emerged at the end of 2008 markedly shifted the apparent trade-offs between cost and risk. The world's major issuers, including in the euro area, had on average been shortening the average maturity of their new issues up until that point. As the crisis intensified, they increased it on average (Graph 5, left-hand and centre panels). Some highly rated issuers continued to issue at quite short maturities, perhaps perceiving such borrowing to have become more attractive on cost grounds. Some issuers might also have considered the sudden crisis-related financing needs to be temporary. In

Sovereign debt issuance patterns

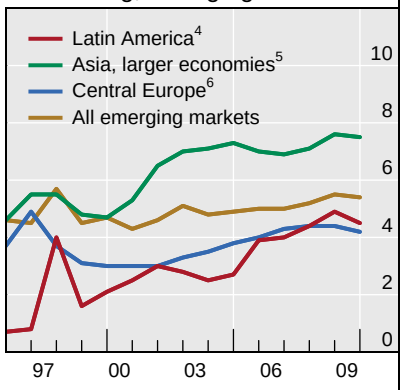
Gross issuance and average maturity at issue[1]



Euro area government debt gross issuance as a percentage of GDP



Maturity (in years) of domestic central government debt outstanding, emerging markets[3]



[1] Australia, Belgium, Brazil, Canada, China, France, Germany, Hong Kong SAR, India, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Singapore, Spain, Sweden, Switzerland, the United Kingdom and the United States. Comprises domestic currency debt only. Quarterly issuance converted into annualised USD billions using the exchange rate on the issuance date, with no exchange rate adjustment subsequently. [2] Denotes debt securities with initial maturity of up to one year. [3] Includes bonds, notes and money market instruments. Weights are given by amounts outstanding. [4] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [5] Chinese Taipei, India and Korea. [6] The Czech Republic, Hungary, Poland and Russia.

Sources: ECB; Bloomberg; BIS. Graph 5

general, though, the subsequent increase in maturity suggests that issuers were conscious of the increased rollover risk associated with persistent short-maturity issuance.

In emerging market economies (EMEs), several years' success in strengthening fiscal positions and debt managers' efforts to deepen and diversify government debt investor bases, particularly for long-term domestic currency debt (Graph 5, right-hand panel), helped limit the disruption during the crisis. These economies were able to restore regular public and private sector issuance on reasonable terms fairly quickly, after interruptions of only a few months during the crisis.

Increased debt issuance does not seem to have impeded unconventional monetary policy from easing monetary conditions

In economies that have used large-scale purchases of government debt as part of unconventional monetary policy, such as the United States, the United Kingdom and Japan, SDM choices may have further significance for financial conditions because of their potential interaction with monetary policy implementation. If debt managers and monetary authorities both operate in large scale in the government debt markets, they need to ensure that their operational plans do not conflict (see box).

Conclusions for banks and policymakers

Banks' options for mitigating the impact of increased sovereign risk

Banks can mitigate, but not eliminate, the impact of sovereign risk

Banks can reduce the effects of rising sovereign credit and liquidity risk by changing their operations, but there are trade-offs in doing so. On the assets side, if sovereign debt is no longer risk-free, banks might further diversify the country composition of their sovereign debt portfolios to reduce their overexposure to their home sovereign. However, for some banking systems,

this may imply a trade-off between sovereign risk and liquidity risk (as foreign sovereign debt may not be eligible to satisfy liquidity standards or as collateral in central bank repurchase agreements).

On the funding side, banks can protect themselves against periodic bouts of (sovereign-induced) investor risk aversion by holding additional capital, making greater use of stable funding sources and diversifying the timing and the jurisdiction of their debt issues.[16] However, this may entail higher absolute funding costs – although banks would still minimise "risk-adjusted" funding costs.

Overall, it is clear that banks can mitigate, but not eliminate, the impact of sovereign credit risk, due to the extensive role of government securities in the financial system.

Implications for policymakers

The first policy priority is to ensure sound public finances

The first and foremost task for policymakers to minimise the impact of sovereign risk is to ensure sound public finances. It is very difficult to protect

Sovereign debt management and monetary conditions

The relative supply of government bonds can affect interest rates if arbitrage is imperfect. Such imperfections, or "preferred habitat" effects, can arise from investors looking to match the duration or other risk characteristics of their liabilities.[①] These effects are likely to be especially relevant under the current strained circumstances, with financial weakness and uncertainty, including about interest rates themselves, limiting market participants' willingness or ability to take risk and to arbitrage. Evidence suggests that such effects are generally small, but significant.[②]

Central banks using large-scale government bond purchases to lower long-term interest rates may thus need to take account of increased government debt issuance, and of debt management operations shifting the relative supply of securities. In recent years, central bank asset purchases and increased government debt issuance have been of roughly the same magnitude. However, in practice, unconventional monetary policy seems to have achieved its objective of easing monetary conditions, without being materially impeded by any yield effects of government issuance (see, for example, Gagnon et al (2010)).[③]

This probably reflects two factors. First, (non-sterilised) central bank asset purchases increase the monetary base, whereas government debt issues usually fund spending or the maturation of existing debt, leaving the monetary base unchanged overall. Second, the agencies' communications, bolstered by clear institutional separation, strongly signalled their distinct policy intentions and objective functions. The monetary authorities emphasised price or macroeconomic stability, and the debt managers focused on steady and predictable issuance.

When central banks come to sell the government debt they hold, they will operate on the same side of the market as debt managers. This could amplify the impact on yields, although the gradual return of normal arbitrage and risk appetite may reduce this effect somewhat. The respective agencies will again need to communicate their objectives and ensure their respective operational plans are clearly understood.

① See the discussion in, for example, McCauley and Ueda (2009) and Turner (2011). ② See eg Swanson (2011). ③ See Borio and Disyatat (2010) for a discussion of the different channels by which unconventional monetary policy can act on monetary conditions.

[16] By issuing debt in different jurisdictions through subsidiaries, banks can potentially benefit from support, either explicit or perceived, from multiple sovereigns.

the banking system from the extreme interest rate, balance sheet and funding uncertainties caused by a distressed domestic sovereign. By moving quickly to implement credible strategies to stabilise debt burdens, and in some countries, to improve transparency about overall public debt levels, governments can address the root causes of the problem. Such actions are essential in anchoring market views about sovereign risk and avoiding unnecessary volatility and negative spillovers to banks.

Policymakers can manage the impact of sovereign risk on financial stability by prudent sovereign funding strategies and open communication …

Debt managers can help to minimise the risk of sudden shocks to government funding and the associated financial volatility by lengthening and spreading maturities and also by avoiding large, concentrated placements. In the euro area, awareness of the connection between government debt rollover risks and financial volatility has led to a commitment to lengthen maturities.[17] A recent forum of debt managers and central banks from 33 advanced and emerging market countries also emphasised better communication and risk mitigation in a set of principles for managing sovereign debt in the context of market turbulence (IMF Forum (2010)). Principle 6 is that "Communication among debt managers and monetary, fiscal, and financial regulatory authorities should be promoted, given greater inter-linkages across objectives, yet with each agency maintaining independence and accountability for its respective role". This principle recognises that medium-term maturity structure and risk targets matter for financial conditions and financial stability, and that all public agencies operating in government debt markets need to ensure their objectives are well understood.

… close monitoring and appropriate disclosure of banks' sovereign exposures …

Given the challenges for fiscal policy, supervisors and central banks need to prepare for the likelihood of a sustained period of higher and more volatile sovereign risk premia.[18] Bank supervisors may need to closely monitor the interaction of sovereign risk with regulatory policies that encourage banks to hold large quantities of public debt. Also, when risk aversion is high, and uncertainty about individual banks' assets (including their sovereign portfolios) creates funding pressures for all banks, coordinated ad hoc disclosures of banks' sovereign exposures may be beneficial.

… flexible operational frameworks …

More flexible operational frameworks that, during severe crises, allow central banks to supply funding to banks against a broad range of collateral would help ease immediate liquidity pressures. However, this is not costless – it shifts credit risk to the central bank and encourages moral hazard – and so should be used sparingly and with the appropriate safeguards.

… and further regulatory reforms

Ongoing regulatory reforms that target the "too big to fail" issue are also important. They will reduce investors' expectations of government support for banks, thereby helping to weaken the link between sovereigns and banks.

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[17] In November 2010, the Eurogroup agreed that "Member States will strive to lengthen the maturities of their new bond issues in the medium-term to avoid refinancing peaks" (www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ecofin/118050.pdf).

[18] See Carney and Panetta (2011).

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