

Highlights of international banking and financial market activity

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 2010. The discussion on international debt securities and exchange-traded derivatives draws on data for the second quarter of 2010.

The international banking market¹

The contraction of BIS reporting banks' international balance sheets that had begun in the fourth quarter of 2008 came to an end *during the first three months of 2010*. The turnaround was led by sizeable increases in international claims on residents of the United Kingdom and the United States. It was also boosted by continuing acceleration in cross-border claims on Asia-Pacific and Latin America and the Caribbean, which were the first two regions to experience positive post-crisis growth in international lending in the second quarter of 2009. Claims on the euro area and on emerging Europe continued to decline. Nevertheless, internationally active banks increased their exposures to Greece, Ireland, Portugal and Spain, mainly as a result of rising off-balance sheet items. BIS data reveal that, as of the end of March 2010, the euro area public sector portfolios of euro zone banks had a larger share of higher-yielding government debt than those of other major banking systems, which had a greater proportion of lower-yielding government debt.

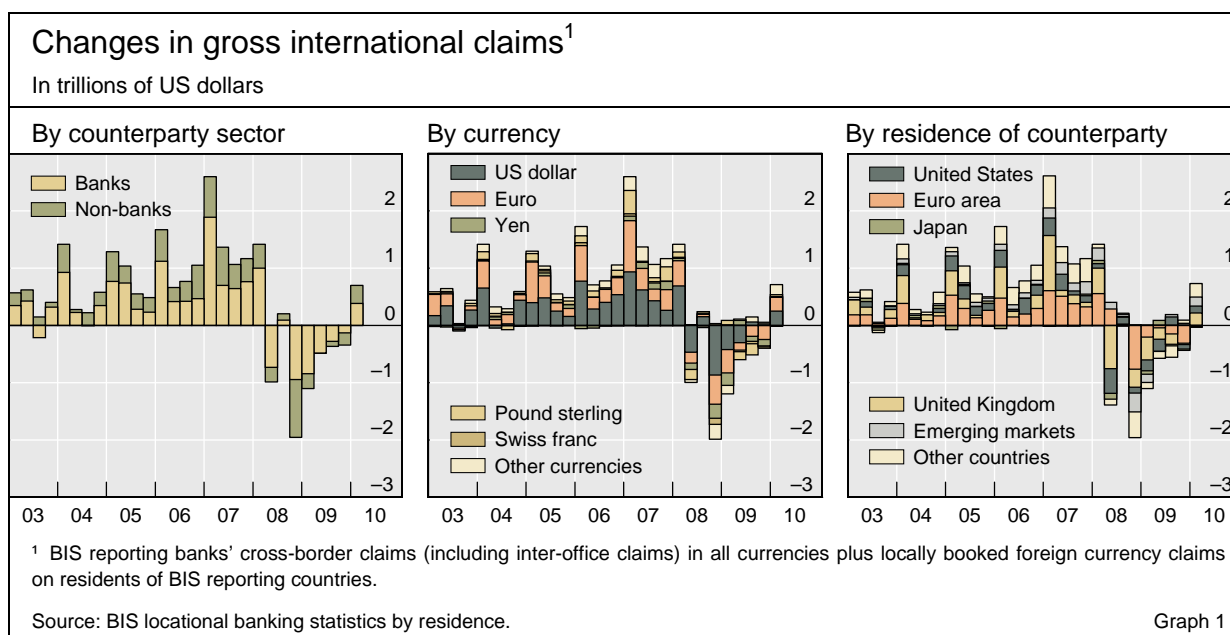
International claims expand for the first time in six quarters²

During the first three months of 2010, the international claims³ of BIS reporting banks rose for the first time since the third quarter of 2008. The \$700 billion

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. All reported flows in international claims have been adjusted for exchange rate fluctuation and breaks in series.

³ International claims consist of cross-border claims and local claims denominated in foreign currencies.



(2.1%)⁴ increase brought the aggregate stock of international claims to \$33.4 trillion (Graph 1, left-hand panel). The expansion was driven by solid increases in both interbank claims (\$383 billion or 1.8%) and claims on non-bank entities (\$317 billion or 2.5%).

The overall expansion in claims was broadly spread across currencies (Graph 1, centre panel). The largest increases were recorded in claims denominated in US dollars (\$253 billion or 1.9%) and in euros (\$238 billion or 1.9%). Claims denominated in sterling and yen also moved up, rising by \$30 billion (1.6%) and \$15 billion (1.3%), respectively. The only major currency showing a decline was the Swiss franc. Claims denominated in that currency fell by \$14 billion (2.1%).

The counterparty residence breakdown produces a more mixed picture (Graph 1, right-hand panel). International claims on residents of the United Kingdom expanded (by \$217 billion or 3.5%) for the first time since the first quarter of 2008. Reporting banks also increased their claims on US residents (by \$120 billion or 2.4%). By contrast, banks decreased their claims on residents of Japan (by \$9 billion or 1.0%) for the third quarter in a row. Furthermore, claims on residents of the euro area contracted by \$21 billion (0.2%), despite the fact that euro-denominated claims on the region increased by \$72 billion (0.9%). The overall decline largely reflected a \$100 billion (8.4%) shrinkage in US dollar-denominated claims on banks located in the area. More than a third of the latter reduction (\$37 billion) was reported by banks located in the United States.

Claims denominated in US dollars and euros expand significantly

Cross-border claims on Asia-Pacific and Latin America-Caribbean soar

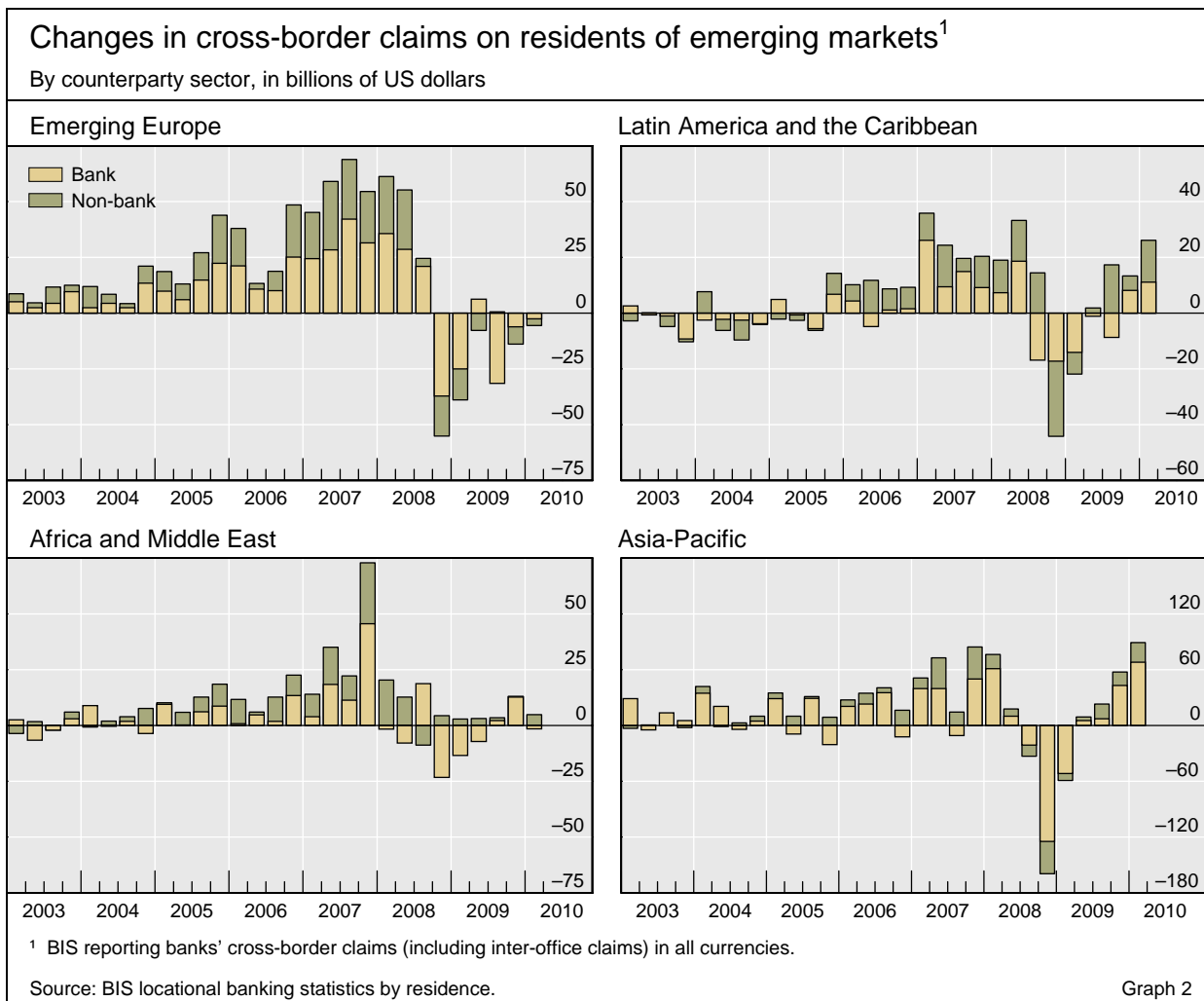
Cross-border claims on residents of emerging market economies grew for the fourth quarter in a row (Graph 2). The \$113 billion (4.6%) expansion in the first quarter of 2010 was about 40% larger than the combined increases of the

⁴ All percentage figures refer to changes over the stock at the end of the previous quarter.

previous three quarters. Most of it was due to a \$75 billion (6.4%) rise in interbank claims, although claims on non-banks also expanded significantly (\$38 billion or 3.0%). Just as in the previous three quarters, the overall increase was led by heavy borrowing by the residents of the faster-growing Asia-Pacific and Latin America-Caribbean regions. Conversely, claims on emerging Europe, where the recovery in economic activity has been much slower, declined for the sixth quarter in a row, albeit at a decreasing rate.

Growth in cross-border claims on Asia-Pacific ...

In line with the strong economic growth in Asia-Pacific, BIS reporting banks expanded their cross-border claims on residents of the region for the fourth quarter in a row. Almost half of the \$89 billion (11.4%) overall increase was due to an unprecedented \$42.1 billion (23.8%) surge in claims on residents of China. Meanwhile, claims on residents of India went up by \$18.1 billion (13.5%), the second largest increase on record. In addition, banks significantly expanded their cross-border lending to Korea (by \$11.0 billion or 5.5%), Chinese Taipei (by \$6.3 billion or 11.7%), Indonesia (by \$4.7 billion or 10.2%) and Malaysia (by \$2.9 billion or 7.6%). Some of those increases could be linked to carry trades that took place during the period as a result of the considerable interest rate differentials between some of the above-mentioned countries and the major developed economies (see Chapter IV of the BIS *80th Annual Report* for a detailed discussion of recent carry trade developments and trends).



Although somewhat smaller than the increase in lending to the Asia-Pacific region, the rise in cross-border claims on Latin America and the Caribbean during the first quarter of 2010 was also sizeable. The \$26 billion (6.4%) expansion was the fourth in a row and the largest since the second quarter of 2008. Once again, reporting banks directed most of their lending in the region towards Brazil. Cross-border claims on residents of that country grew by \$18.7 billion (11.3%). Claims on residents of Mexico also recorded solid gains, increasing by \$7.3 billion (7.7%). By contrast, lending to Argentina shrank for the seventh consecutive quarter (by \$0.3 billion or 2.3%). Nevertheless, the fall was by far the smallest since the start of the contraction.

... and Latin America and the Caribbean accelerates

The slower pace of economic growth in emerging Europe contributed to the sixth consecutive decline in cross-border claims on its residents. Nevertheless, the \$6 billion (0.7%) contraction was much smaller than the ones registered in the preceding two quarters. The countries that saw the largest declines in claims on their residents were Russia (\$4.2 billion or 2.9%), Croatia (\$1.6 billion or 3.5%) and the Czech Republic (\$1.5 billion or 3.3%). By contrast, claims on Poland expanded for the fourth consecutive quarter (by \$4.0 billion or 3.3%), while cross-border lending to Hungary increased slightly (by \$0.5 billion or 0.6%) ahead of the country's parliamentary elections in April.

Lending to emerging Europe continues to decline

Banks increase exposures to Greece, Ireland, Portugal and Spain⁵

BIS reporting banks increased their total exposures⁶ to residents of Greece, Ireland, Portugal and Spain in the first quarter of 2010, despite mounting market pressures on these countries (Graph 3). The \$109 billion (4.3%) combined expansion brought BIS reporting banks' aggregate exposures to that group of economies to \$2.6 trillion (Table 1).

Total exposures to Greece, Ireland, Portugal and Spain increase

Total exposures to Greece grew by \$20.7 billion (7.1%). The expansion was driven by a \$21.6 billion (29.3%) rise in BIS reporting banks' other exposures, most of which reflected an \$18.1 billion (54.0%) increase in their credit commitments to residents of the country. By contrast, foreign claims on residents of Greece declined by \$0.9 billion (0.4%). Claims on non-banks and claims on the public sector both went up (by \$4.0 billion (4.7%) and \$0.8 billion (0.8%), respectively). However, those increases were more than offset by a \$5.7 billion (16.9%) contraction in foreign claims on banks located in the country.

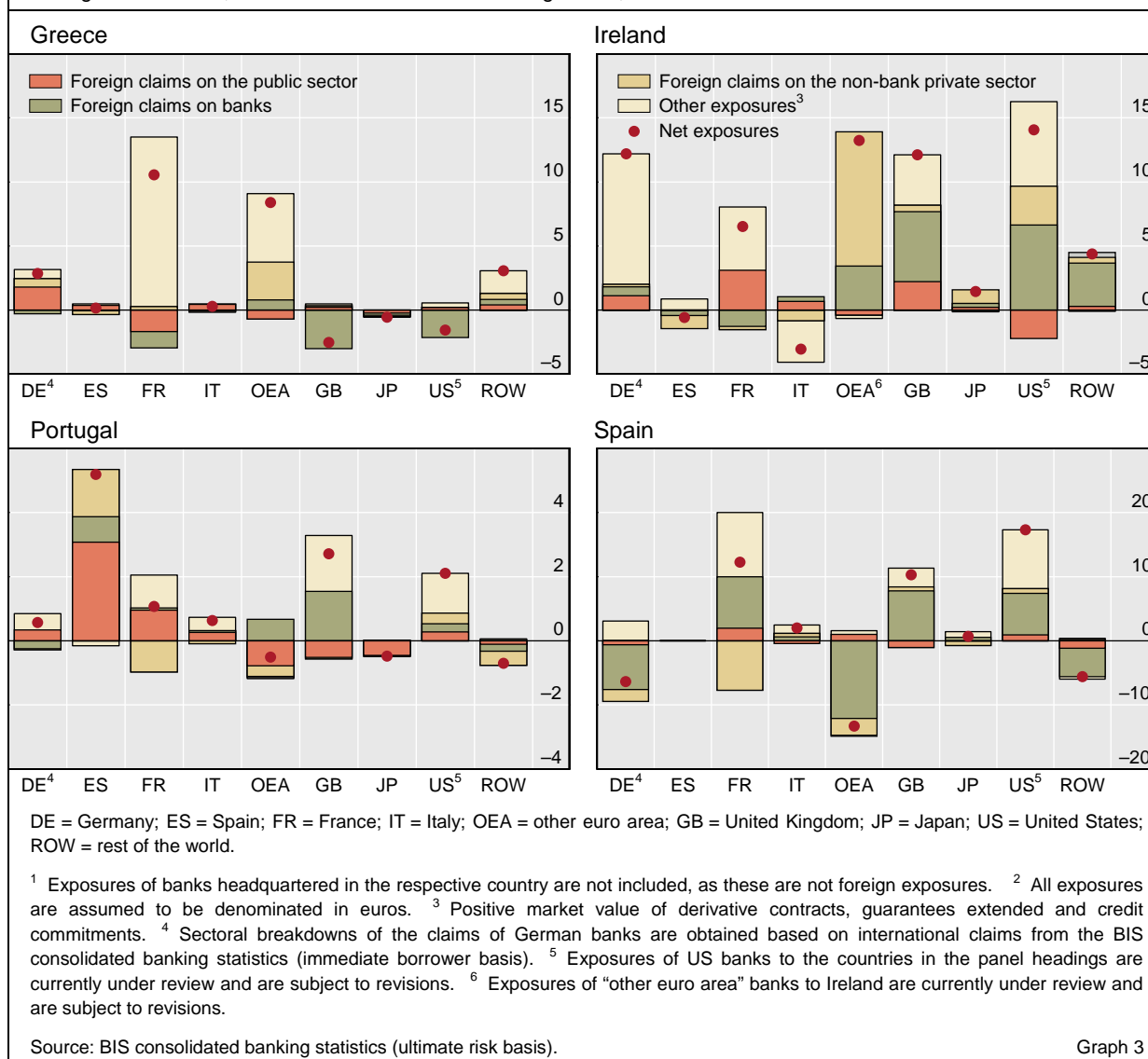
BIS reporting banks also increased their exposures to the residents of Spain and Portugal. Despite the fact that foreign claims on Spain declined by \$10.3 billion (1.2%) during the period, overall exposures to residents of the country expanded by \$17.3 billion (1.5%) due to a \$27.6 billion (11.8%) rise in

⁵ The analysis in the following two subsections is based on the BIS consolidated international banking statistics on an ultimate risk basis. Since this dataset does not contain a currency breakdown, we adjust all flow variables for exchange rate fluctuations by assuming that all exposures to residents of Greece, Ireland, Portugal and Spain are denominated in euros.

⁶ *Total exposures* consist of two main components: *foreign claims* and *other exposures*. In turn, *foreign claims* consist of cross-border claims and local claims in all currencies; *other exposures* consist of positive market value of derivative contracts, guarantees extended and credit commitments.

Foreign exposures to Greece, Ireland, Portugal and Spain, by bank nationality¹

Changes in Q1 2010, at constant end-Q1 2010 exchange rates;² in billions of US dollars



banks' other exposures. Meanwhile, banks increased their total exposures to Portugal by \$10.6 billion (3.2%). Both foreign claims and other exposures went up (by \$5.8 billion (2.3%) and \$4.8 billion (6.1%), respectively). Spanish banks increased their exposures to residents of Portugal by \$5.2 billion (4.7%), more than banks headquartered in any other country.

Patterns in the composition of BIS reporting banks' public sector portfolios

The public sector portfolios of banks headquartered in the euro area had a significantly different composition from those of their US, UK and Japanese counterparts. As of the end of March 2010, holdings of euro area government debt represented a much higher share (54%) of the public sector portfolios of euro area banks than of the public sector portfolios of Japanese (30%), UK (24%) and US (23%) banks (Graph 4, left-hand panel). This is hardly surprising, given the ability of euro area banks to fund claims on euro area

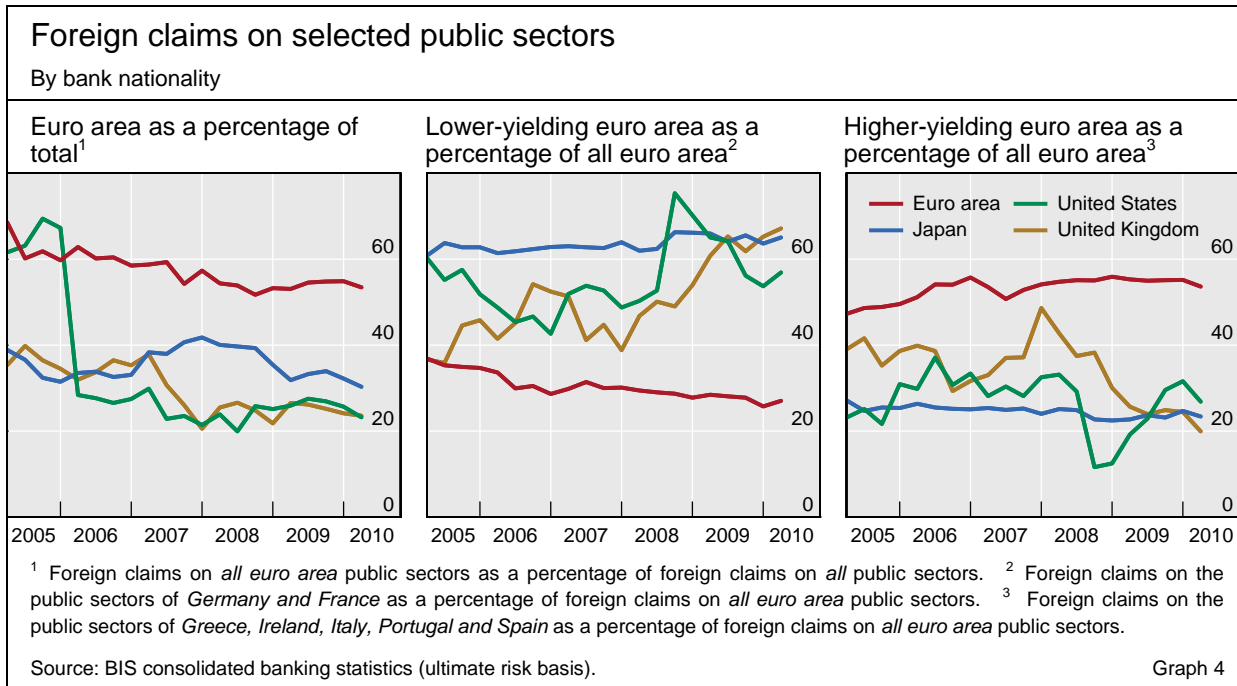
Foreign exposures to Greece, Ireland, Portugal and Spain, by bank nationality ¹											
End-Q1 2010; in billions of US dollars											
Exposures to	Type of exposures	Bank nationality									
		DE ²	ES	FR	IT	OEA	GB	JP	US	ROW	Total
Greece	Public sector	23.1	0.9	27.0	3.3	22.9	3.6	4.3	5.4	2.0	92.5
	+ Banks	10.5	0.0	3.9	1.2	2.6	2.2	0.5	3.1	2.1	26.1
	+ Non-bank private	10.0	0.2	40.2	2.2	14.5	6.0	0.9	5.2	3.9	83.2
	+ Unallocated sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	= Foreign claims	43.6	1.1	71.1	6.8	40.1	11.8	5.8	13.6	8.1	202.0
	+ Other exposures ³	7.4	0.5	40.5	2.0	7.8	4.7	0.2	27.5	4.6	95.2
= Total exposures	51.0	1.6	111.6	8.8	47.9	16.5	5.9	41.2	12.7	297.2	
Ireland ⁴	Public sector	3.4	0.2	8.7	0.9	3.8	7.3	1.8	1.9	1.8	29.7
	+ Banks	46.0	2.5	21.1	3.6	14.0	42.3	1.8	24.6	12.7	168.6
	+ Non-bank private	118.1	9.6	20.5	12.0	66.8	114.4	18.3	34.1	27.9	421.7
	+ Unallocated sector	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.8	1.1
	= Foreign claims	167.5	12.3	50.3	16.5	84.9	164.0	21.9	60.6	43.1	621.1
	+ Other exposures ³	38.3	3.9	35.4	12.1	7.6	58.4	1.0	53.2	12.7	222.7
= Total exposures	205.8	16.2	85.7	28.6	92.5	222.4	22.9	113.9	55.8	843.8	
Portugal	Public sector	9.9	10.6	20.4	2.2	11.5	2.6	2.3	1.6	1.7	62.9
	+ Banks	20.3	7.4	7.3	3.1	7.0	6.6	0.4	2.0	1.4	55.4
	+ Non-bank private	8.2	66.7	14.4	1.1	8.2	15.8	0.9	1.6	1.5	118.4
	+ Unallocated sector	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	= Foreign claims	38.4	84.7	42.1	6.5	26.7	25.0	3.6	5.2	4.6	236.7
	+ Other exposures ³	8.1	23.3	7.6	2.9	2.4	7.4	0.4	32.1	1.4	85.6
= Total exposures	46.6	108.0	49.7	9.4	29.1	32.4	4.0	37.3	6.0	322.4	
Spain	Public sector	30.0	.	46.9	2.3	19.1	7.6	12.5	4.9	4.4	127.6
	+ Banks	95.0	.	69.7	11.1	68.7	27.6	4.5	28.6	12.1	317.4
	+ Non-bank private	55.2	.	83.1	16.4	98.3	75.0	9.4	28.7	12.1	378.2
	+ Unallocated sector	0.0	.	0.0	0.0	0.1	0.0	0.0	0.0	0.7	0.9
	= Foreign claims	180.2	.	199.8	29.9	186.1	110.2	26.4	62.2	29.3	824.1
	+ Other exposures ³	37.7	.	44.4	12.6	14.4	31.5	3.6	124.1	10.0	278.5
= Total exposures	217.9	.	244.2	42.5	200.6	141.7	30.0	186.4	39.3	1102.6	

DE = Germany; ES = Spain; FR = France; IT = Italy; OEA = other euro area; GB = United Kingdom; JP = Japan; US = United States; ROW = rest of the world.

¹ Exposures of banks headquartered in the respective country are not included, as these are not foreign exposures. ² Sectoral breakdowns of the claims of German banks are obtained based on international claims from the BIS consolidated banking statistics (immediate borrower basis). ³ Positive market value of derivative contracts, guarantees extended and credit commitments. ⁴ Exposures of "other euro area" banks to Ireland are currently under review and are subject to revisions.

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

Table 1



governments with domestic deposits and to use euro area government bonds as collateral when borrowing from the ECB.

The euro area public sector portfolios of euro zone banks differ substantially from those of UK, Japanese and US banks

The euro area public sector portfolios of euro zone banks had a considerably larger share of higher-yielding government debt (eg that of Greece, Ireland, Italy, Portugal and Spain) than those of banks headquartered in other regions, which had a greater proportion of lower-yielding government debt (eg that of Germany and France). As of the end of the first quarter of 2010, the foreign claims of UK, Japanese and US banks on the public sectors of Germany and France represented 67%, 65% and 57%, respectively, of their foreign claims on all euro area public sectors (Graph 4, centre panel). By contrast, that fraction was equal to only 27% for euro area banks. The ordering of these shares is completely reversed when one focuses on reporting banks' holdings of higher-yielding euro area government debt (Graph 4, right-hand panel). Euro area banks' claims on the public sectors of Greece, Ireland, Italy, Portugal and Spain represented close to 54% of their overall holdings of euro area government debt. By comparison, these fractions were equal to 27%, 23% and 20% for US, Japanese and UK banks, respectively.

There are a variety of possible explanations for these differences. First, it could be that banks headquartered outside the common currency area may have found it more difficult than their euro zone peers to assess the credit risk of a euro area member state. This would have naturally made them more cautious, thus causing them to invest relatively smaller fractions of their euro area public sector portfolios in higher-yielding government debt. Second, during the period under investigation, all euro area government debt could be used as collateral at the ECB on identical terms. As a consequence, the lower market liquidity of the debt issued by the governments of Greece, Ireland, Italy, Portugal and Spain (relative to that of German and French government debt)

Foreign currency borrowing in emerging Europe: households as carry traders

Robert N McCauley

Currency weakness in central and eastern Europe during the crisis highlighted the risk of foreign currency debt. Such debt can hedge exporters' cash flows. But households without foreign currency income can struggle with sudden hikes in the cost of servicing foreign currency mortgages.

This box first uses the BIS international banking data comprehensively to measure foreign currency borrowing in emerging Europe on the eve of the global financial crisis. Then it shows that a simple model can account for much of the variation across countries in the reliance on foreign currency debt and in the choice of foreign currency. In particular, a borrower weighs the interest savings of a foreign currency loan against the prospective instability of its servicing cost in domestic currency. In another context, this model is used to describe the opportunity of speculators who borrow in a low-yielding currency to fund investment in a high-yielding currency ("carry traders").

We find first that foreign currency lending in emerging Europe was larger than previously thought. Second, the extent of foreign currency borrowed in each country depended on the ratio of interest savings to currency volatility. Moreover, the same perspective can also explain why debtors in some countries borrowed mostly in euros while debtors in other countries borrowed more in Swiss francs. Thus, interest rate and exchange rate policies shaped the demand for foreign currency debt. The supply side adapted: Swedish banks lent euros in the Baltics, while affiliates of German, Italian and US banks, not Swiss banks, lent Swiss francs in Poland and Hungary.

How large was foreign currency lending in emerging Europe?

Emerging Europe had borrowed more in foreign currency by the third quarter of 2007 than has been appreciated. Including cross-border loans booked elsewhere in Europe reported to the BIS, the foreign currency share of loans had in aggregate reached about one half. It ranged from a quarter (Czech Republic) to almost 90% (Latvia). These shares are all higher than one observes in loans booked domestically in central and eastern Europe.⁹ While this phenomenon is often called euroisation, Swiss franc loans represented about 20% of foreign currency loans.

What accounts for the differences across countries in the share of foreign loans? The next section provides a partial answer to this question.

Households and firms as carry traders

The extent of foreign currency lending in emerging Europe can be understood to a large extent from the demand side. Private borrowers in these economies traded off the interest savings of foreign currency borrowing against the risk of having one's debt ratchet up in terms of domestic currency. Given interest rates in the euro and Swiss franc, this trade-off reflected policy differences across emerging Europe, both in the setting of interest rates and in the management of currencies.

One can think of households and firms in these economies as analogous to carry traders. Carry traders accept principal risk on their position in exchange for receiving net interest receipts ("positive carry"). Similarly, households and firms in the region accept principal risk on their mortgages or corporate loans, as translated into domestic currency, in exchange for lower interest rates. The trade-off between carry and risk for foreign currency borrowers is captured by the Sharpe ratio, which divides the interest savings in per cent by the volatility of the relevant exchange rate, also in per cent. The higher the ratio, the more attractive the position.

It is easy to see why there might be interest savings from denominating debts in euros or Swiss francs. Central and eastern European economies are catching up with their counterparts in western Europe, and so productivity is rising rapidly in the traded goods sector (eg auto production). If productivity improves less in services (eg haircuts), then the relative cost of services rises faster during the catch-up. Since traded goods tend to be priced similarly in an integrated market, this implies that inflation is higher in the country catching up, calling for higher policy interest rates.¹⁰

In fact, interest rates in central and eastern Europe have tended to be higher than in the euro area in recent years. Only in the Czech Republic have short-term interest rates tended to be lower than their counterparts in the euro area. Interest rates were even lower on Swiss franc borrowing.

A lower interest rate, the *gain*, had to be weighed against the potential *pain* of debt service rising in terms of the domestic currency. Some authorities managed their currencies tightly against the euro, but others allowed more movement. We measure the extent to which the exchange rate

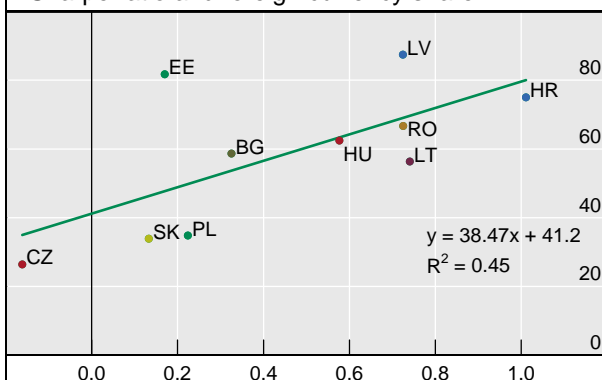
against the euro actually moved over the period from October 2004 to September 2007. The volatility – measured by the annualised standard deviation of daily percentage changes – of the domestic currency against the euro ranged from 0–2% in the Baltics, Bulgaria and Croatia to almost 8% in Hungary, Poland and Romania. A wide interest rate differential and low volatility (a high Sharpe ratio) favoured foreign currency borrowing, while a narrow interest rate differential and high volatility discouraged foreign currency borrowing.

Sharpe ratios and the choice

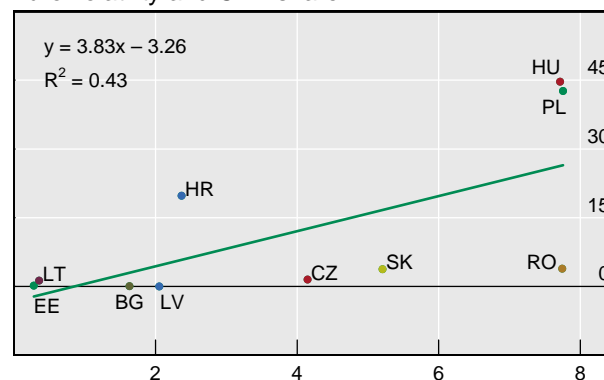
One can divide the decision-making into two steps. Households and firms first assess the attractiveness of the interest saving from euro-denominated debt in relation to the volatility of the domestic currency against the euro. For each currency, the average three-month interest differential between the euro and the domestic currency in October 2004–September 2007 is divided by the volatility of the bilateral exchange rate between the euro and the local currency. When this ratio is plotted against the share of foreign currency borrowing, countries with higher Sharpe ratios show higher fractions of foreign currency debt. The Sharpe ratio alone accounts for over 40% of the cross-sectional variation in such borrowing in the region (Graph A, left-hand panel).³

Foreign currency debt in emerging Europe

Sharpe ratio and foreign currency share¹



Euro volatility and CHF share²



BG = Bulgaria; CZ = Czech Republic; EE = Estonia; HR = Croatia; HU = Hungary; LT = Lithuania; LV = Latvia; PL = Poland; RO = Romania; SK = Slovakia.

¹ The x-axis shows the Sharpe ratio of the domestic currencies, where the numerator is the 36-month average of the three-month interest rate differential for the period October 2004–September 2007 and the denominator is the annualised volatility of the exchange rates of the respective local currency versus the euro over the same period; the y-axis shows all foreign currency loans as a percentage of all loans in September 2007. ² The x-axis shows the annualised volatility of the exchange rate of local currency versus the euro over period October 2004–September 2007; the y-axis shows the CHF loans as a percentage of all foreign currency loans in September 2007.

Sources: Brown et al (2009); Bloomberg; Datastream; national data; BIS calculations.

Graph A

The next step is to account for the choice of denomination of the foreign currency lending. In terms of the interest rate, there would be the same 1½% saving on a franc vis-à-vis a euro loan anywhere from the Baltics to Bulgaria. However, the exchange rate volatility would look very different from the various perspectives in the region. Where the local currency tracked the euro closely, the volatility of the Swiss franc versus the euro would make franc borrowing less attractive. Where, as in Hungary and Poland, the domestic currency fluctuated considerably against the euro, there was little incremental volatility to borrowing in the Swiss franc to offset the interest saving. The 1½% lower interest rate looked good when compared to the ½% (in Poland) or ¼% (in Hungary) additional volatility of Swiss franc debt, and in those countries its share is highest (Graph A, right-hand panel). Ironically, currency flexibility encouraged Swiss franc debt, which has proven painful to obligors given the 20% rise of the Swiss franc/euro rate from September 2007 to August 2010.

³ Cross-border loans reported to the BIS represented about 19% of the domestically booked loans that are reported by M Brown, M Peter and S Wehrmüller, "Swiss franc lending in Europe", *Aussenwirtschaft*, no 64(2), 2009, pp 167–81. ⁴ This assumes stable nominal exchange rates; see D Mihajek and M Klau, "Catching-up and inflation in transition economies: the Balassa-Samuelson effect revisited", *BIS Working Papers*, no 270, December 2008. ⁵ M Brzoza-Brzezina, T Chmielewski and J Niedzwiedzińska, "Substitution between domestic and foreign currency loans in Central Europe. Do central banks matter?", *ECB Working Paper Series*, no 1187, May 2010, show that foreign currency debt responds to Czech, Hungarian, Polish and Slovak interest rates.

was less of a concern for euro area banks than for other banks since the former could “liquefy” this debt in their operations with the ECB. Finally, banks usually hold government debt not only as a standalone investment instrument but also to support their derivatives trading operations. If non-euro area banks held smaller investment portfolios of euro area public debt but traded derivatives on euro-denominated interest rates, then the latter type of government debt holdings would have represented a higher fraction of their euro area public sector portfolios. Those holdings would have naturally been concentrated in the German and French benchmark government securities because of their liquidity and the relatively low credit risk associated with them.

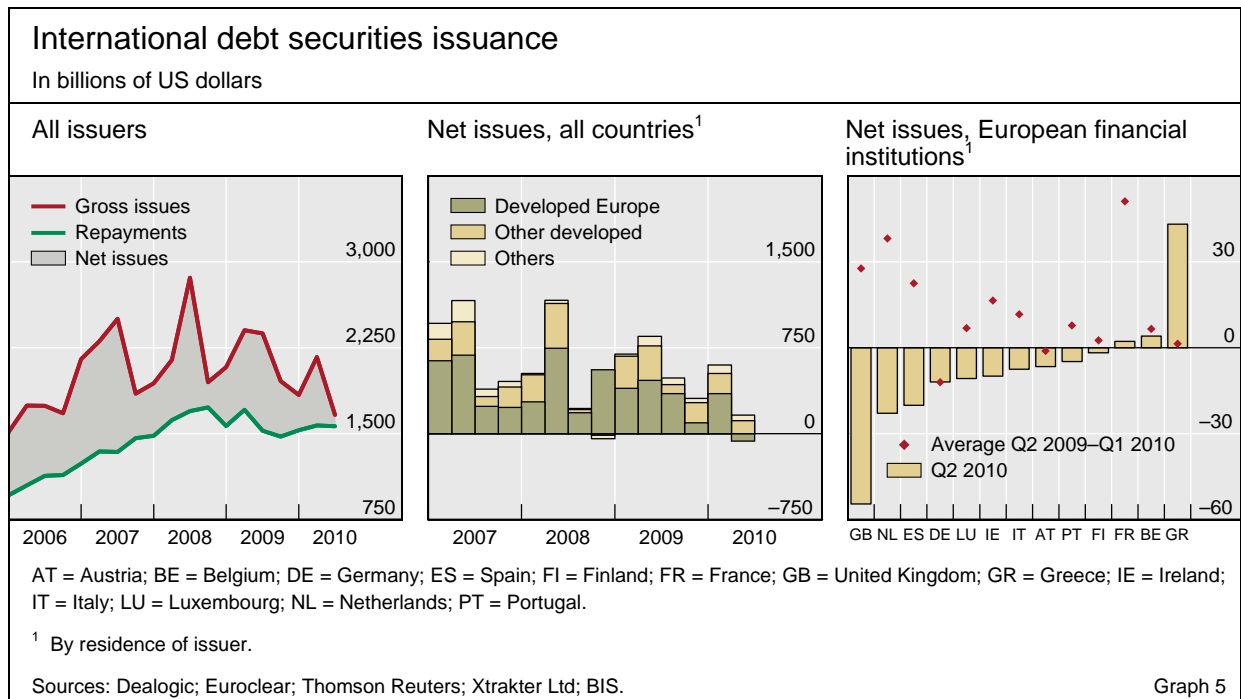
The international debt securities market⁷

The turbulence in the European sovereign bond market led to a sharp drop in activity in the primary market for international debt securities *in the second quarter of 2010*. Completed gross issuance fell by 23% to \$1,664 billion, the lowest since late 2005 and well below the levels seen during the financial crisis (Graph 5, left-hand panel). With stable repayments, net issuance dropped by 83% to \$99 billion, the lowest since the late 1990s.

Net issuance drops to lowest value since late 1990s

Borrowers from the advanced economies in particular found it difficult to place debt at attractive conditions. Net issuance by residents in the developed world fell by 90% to merely \$51 billion (Graph 5, centre panel), with net repayments of \$64 billion in Europe, \$7 billion in Japan and \$3 billion in Australia. US entities raised \$94 billion, 38% less than in the previous quarter. By contrast, borrowing by residents in developing economies held up well,

Sharp fall in developed country issuance contrasts with higher borrowing by emerging market residents



⁷ Queries concerning the international debt securities statistics should be directed to Christian Upper.

increasing by 20% to \$30 billion. International financial institutions tapped the market to raise \$31 billion – 28% less than in the previous quarter, but still well above the average quarterly net issuance in recent years.

Developed country issuance fell across all sectors, although financial institutions took the brunt of the hit. They recorded net redemptions of \$55 billion, after net issues of \$292 billion in the first three months of the year. Net government issuance fell by 78% to \$26 billion, and net non-financial corporate issuance declined by 31% to \$80 billion.

Net repayments by European financial institutions

Financial institutions in Europe accounted for by far the largest part of the net redemptions of the sector. Although completed gross issuance fell roughly in line with that of financial institutions in other regions (22%, compared to 26% in the United States, for example), almost unchanged repayments led to sizeable net redemptions. Net issuance turned positive in June, but this did not offset large net repayments during April and May.

Strong issuance by banks in Greece ...

The European aggregate masks large differences across countries, including among those at the centre of market attention. Greek banks raised \$43 billion in the international market, primarily through the issuance of covered bonds and government-guaranteed medium-term notes.⁸ Greek financial issuance was much larger than that of other countries, and a multiple of what it had been in previous quarters (Graph 5, right-hand panel). Financial institutions in most other European countries on net repaid debt. This includes institutions in Spain and Portugal, two countries which also saw a substantial rise in sovereign spreads. Between April and June, Spanish and Portuguese financial institutions reduced their international bonded debt by \$20 billion and \$5 billion, respectively.

... contrasts with net redemptions by financials in other European countries

Canadian residents raise amounts borrowed

One of the few developed economies (in addition to Greece) that bucked the trend of lower net issuance was Canada. Canadian residents raised \$30 billion on the international debt market, about three times as much as in the previous quarter and the highest since the second quarter of 2008. Canadian financial institutions issued approximately \$19 billion. Canadian provincial governments, led by Ontario, also borrowed sizeable amounts (\$9 billion), whereas non-financial corporations issued \$2 billion, slightly less than in the previous quarter.

Strong emerging market issuance

Emerging market issuers were much less affected by the worsened financial conditions and increased their international debt by 20% to \$30 billion. Non-financial corporate issuance was particularly strong, increasing by 84% to \$16 billion, similar to the levels seen in the second half of last year. Governments borrowed \$15 billion in the international market, 8% more than in the previous quarter. By contrast, emerging market financials repaid \$1 billion, after net issuance of \$2 billion between January and March.

Residents in Latin America and the Caribbean in particular sold more bonds than previously (\$17 billion, after \$11 billion in the first quarter).

⁸ It is not possible to assess how much Greek banks paid for their funding since issue prices are generally not available. However, the fact that some of this paper traded at steep discounts, on the order of 30–40%, just after issuance suggests that the costs of these funds may have been substantial.

Borrowers from Mexico and Brazil accounted for approximately two thirds of international issuance by residents in the region. They raised \$7 billion and \$5 billion, respectively, after \$4 billion and \$7 billion in the first three months of the year. Issuance in emerging Europe, a region closely linked to the euro area, rose by \$2 billion to \$9 billion. Residents in developing Asia-Pacific and in Africa and the Middle East cut their issuance by 59% and 9%, respectively, to approximately \$2 billion.

Exchange-traded derivatives⁹

Growth in activity on the derivatives exchanges decelerated somewhat in the *second quarter of 2010*, compared to the buoyant first quarter. Turnover measured by notional amounts of futures and options on interest rates, stock price indices and foreign exchange increased by 8% quarter on quarter to \$555 trillion between April and June, compared to a 16% rise in the previous three months. The relatively modest expansion reflected divergent developments in the United States and Europe. As euro area sovereign bond yield spreads widened relative to German bunds and the euro depreciated against major currencies (10% against the US dollar), turnover in euro-denominated options on these underlying risk types fell by almost 30%, far more than could be accounted for by the valuation effect alone, and turnover in euro futures barely budged. This contrasted with a 35% and 18% surge in all dollar-denominated options and futures, respectively. Open interest of exchange-traded financial derivatives, expressed in notional amounts outstanding, fell by 8% to \$75 trillion. While outstanding amounts of instruments denominated in dollars were unchanged, those of euro-denominated contracts dropped by 22% during the quarter, driven primarily by declines in interest rate instruments. Increased basis risk across sovereigns probably contributed to decreased use of exchange-traded derivatives for cross-country hedging of exposures in smaller euro area markets.

Divergent developments in the United States and Europe

The differences in activity growth across currencies were primarily driven by developments in the interest rate segment. Turnover in dollar money market contracts went up by 23% to \$235 trillion. By contrast, turnover in contracts on short-term euro rates fell by 15% to \$162 trillion. Similarly, turnover growth in derivatives on dollar bonds (up 22% to \$20 trillion) contrasted with a 3% turnover decline in long-term euro instruments, although outstanding notional amounts and contract numbers on eurobund options roughly doubled.

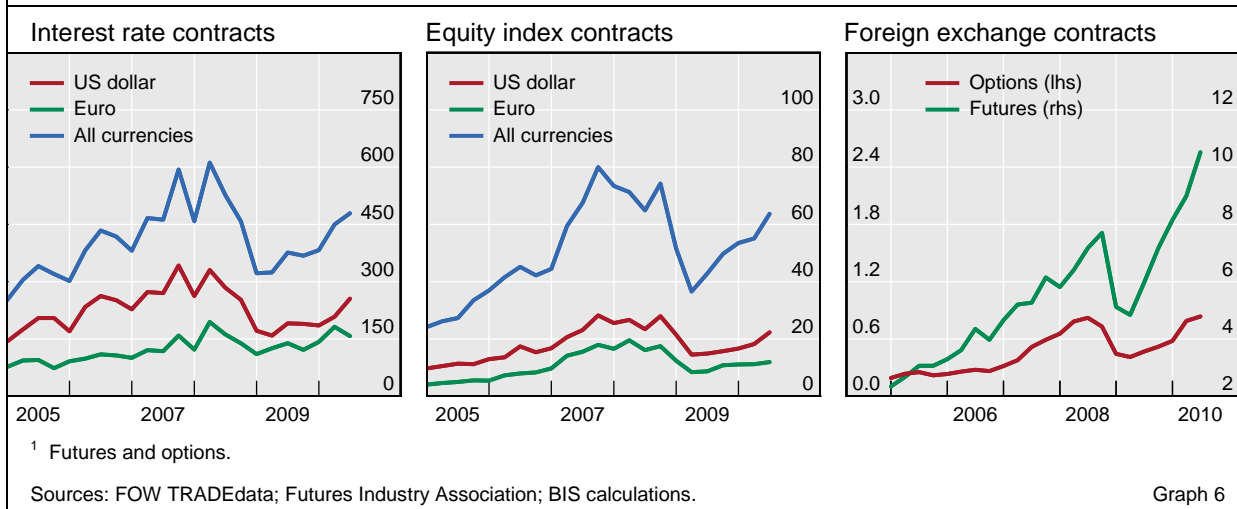
Eurobund options doubled

Activity in futures and options on stock price indices surged on the back of sharply higher stock price volatility. As stock markets first rose and then declined in the United States and Europe, option-implied volatility rocketed almost to levels last seen in the first quarter of 2009. Equity index derivatives turnover measured in notional amounts went up by 15% to \$64 trillion, after having remained almost stable in the first three months of 2010, when implied volatility had declined to the lowest level since early 2009. The number of stock

⁹ Queries concerning the derivatives markets statistics should be addressed to Karsten von Kleist.

Turnover of exchange-traded derivatives¹

Quarterly data, in trillions of US dollars



index contracts traded on the international derivatives exchanges increased by around 20% over the period. While turnover measured in notional amounts on US exchanges grew by 22%, that on European exchanges advanced only 5%. Trading volumes on many Asian exchanges also grew, with a particularly sharp increase in India (36%).

Turnover in FX futures well above previous 2008 peak

Turnover in futures and options on exchange rates increased, but amounts outstanding fell. Trading volumes of FX futures went up by 17% to \$11 billion, well above the previous peak in the third quarter of 2008 (Graph 6, right-hand panel). Open interest fell 12% to \$188 billion. Option turnover increased by much less (6%), with amounts outstanding falling 8% from the peak reached in the first quarter.

Turnover (measured in terms of the number of contracts, since notional amounts are not available) on the international commodities exchanges rose by 8%. There was a hefty 32% increase in activity in contracts on precious metals, as gold prices exceeded the previous peak reached in late 2009. Turnover in derivatives on non-precious metals and energy products went up 24% and 13%, respectively, with metal and oil prices dropping a fifth from the high reached at the beginning of the second quarter. Turnover in contracts on agricultural commodities fell 5%.