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International banking activity amidst the turmoil[1]

The recent period of financial turmoil has had a significant impact on banks' global balance sheet positions. This piece uses the BIS international banking statistics to trace the longer-term developments in the interbank market which contributed to the funding difficulties experienced during the turbulence. It concludes with an analysis of banks' bilateral interbank exposures, at the level of national banking systems, and discusses the emerging signs of a credit contraction.

JEL classification: F34, G15, G21.

Over the last decade, the growth in securitisation, prime brokerage and proprietary trading activity has contributed to an unprecedented expansion in banks' international balance sheets. The most recent period of turmoil has forced banks to bring offloaded assets back on their balance sheets, and the associated rise in counterparty and credit risk concerns has led to severe liquidity problems in the interbank market (Borio (2008)).

This special feature examines the effect that the financial turbulence had on international banking activity through end-2007, as captured in the BIS international banking statistics.[2] In an effort to understand how stresses spread so far from their original source (ie US subprime mortgages), the first section tracks the longer-term build-up of banks' international balance sheets, and their debt security claims on the US non-bank sector in particular. The data point to a sectoral divergence in funding patterns between US and European banks in the US dollar segment of the interbank market, which may have exacerbated the liquidity squeeze.

The next two sections examine the shifts in banks' global banking books since the onset of the credit turmoil in mid-2007, with particular emphasis on what these shifts reveal about banks' willingness to lend to each other. There is some evidence suggesting that banks sought to mobilise liquidity, especially in

[1] The views expressed are those of the authors and do not necessarily reflect those of the BIS. The authors thank Jhuvesh Sobrun for assistance with the graphs.

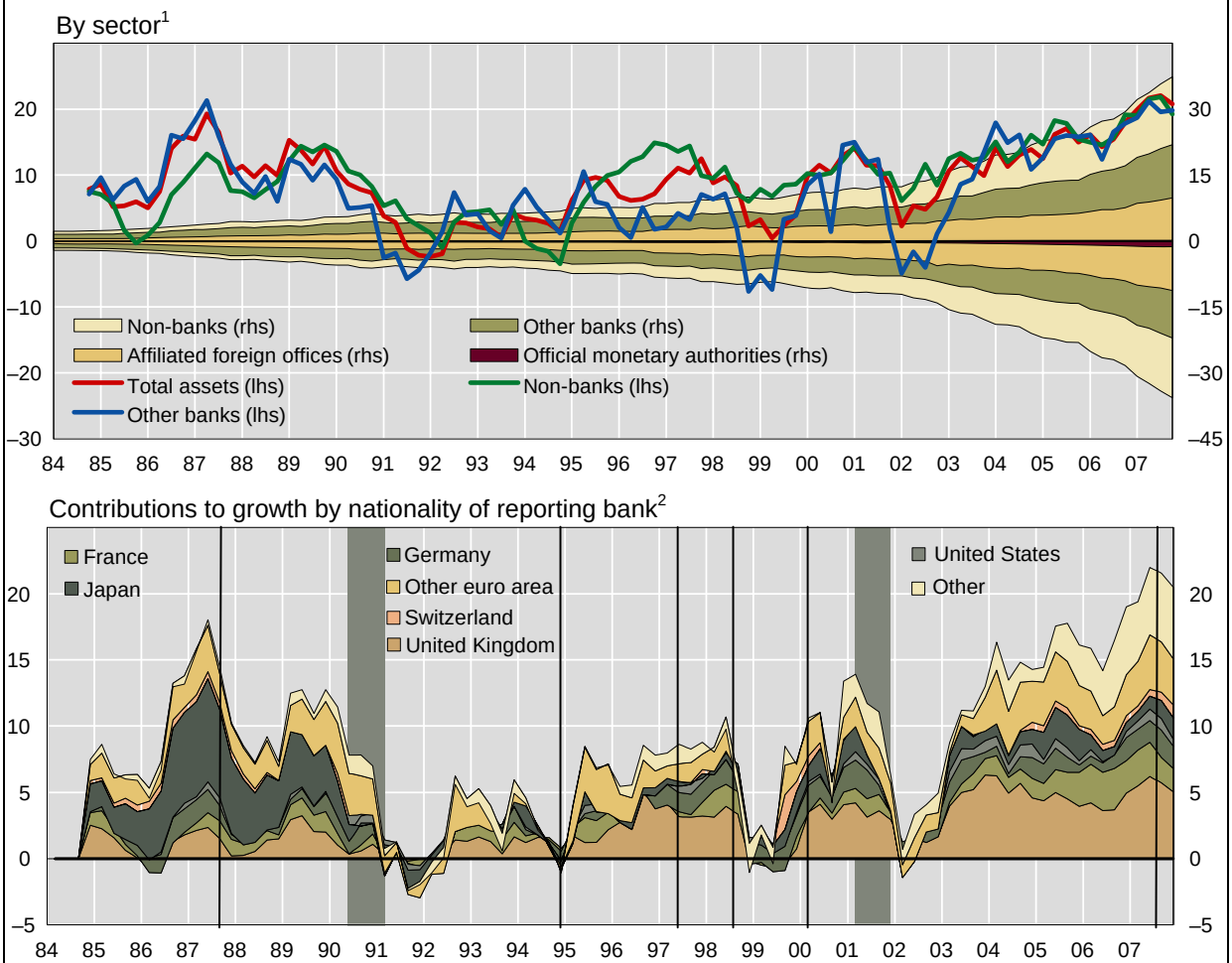
[2] These include the locational banking statistics, broken down by residency and by nationality, and the consolidated banking statistics, on both an immediate borrower (IB) and an ultimate risk (UR) basis. Combined, these data provide aggregate information on the maturity, currency and instrument of internationally active banks' foreign claims and liabilities, broken down by the residency of the borrower, residency of the bank and nationality of the bank.

the US dollar market segment, by tapping their foreign affiliates for funds and scaling back their local operations in the United States. The *bilateral* exposures between national banking systems are analysed in the third section. The expansion in banks' international positions since 2000 went hand in hand with a build-up of bilateral interbank exposures. Many of these exposures contracted during the second half of 2007, particularly those of US- and UK-headquartered banks. The final section concludes.

The build-up of international bank balance sheets

International banking activity has in recent years expanded at the fastest pace since the mid-1980s. The year-on-year growth in banks' total international claims, which had been accelerating steadily since early 2001, peaked at 22% in the third quarter of 2007, a level last approached prior to the 1987 stock market collapse (Graph 1). As a consequence, banks' international balance sheets more than trebled over this period, with total international assets

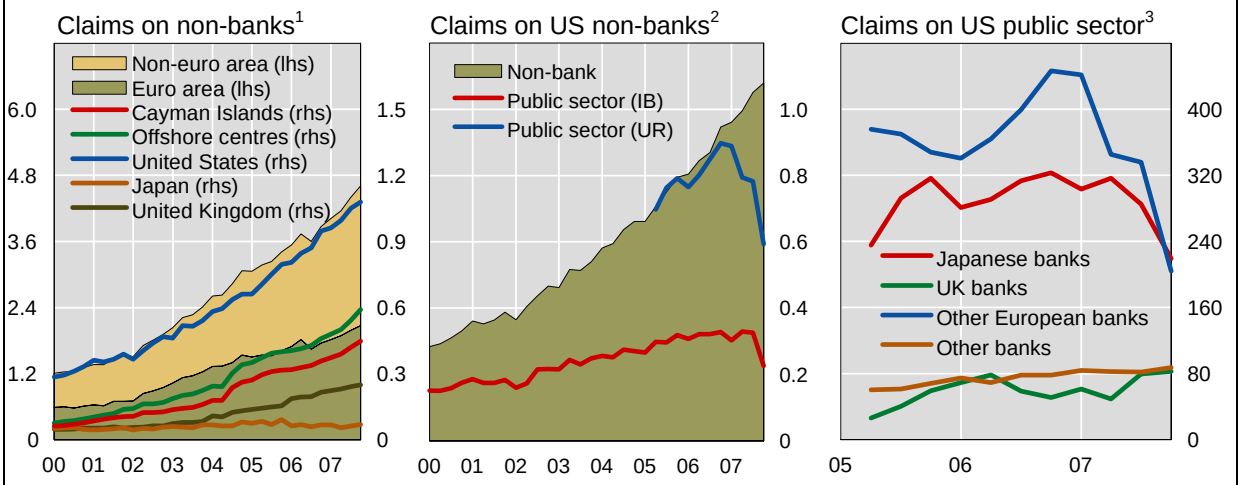
Growth in international bank claims



[1] Lines indicate annual growth rates, in per cent. The positive (negative) shaded areas indicate stocks of assets (liabilities), in trillions of US dollars. [2] The vertical lines mark: Q3 1987 stock market correction; Q4 1994 Mexican peso devaluation; Q2 1997 Asian financial crisis; Q3 1998 Russian default and LTCM; Q1 2000 Nasdaq peak and Q3 2007 subprime-related turmoil. The shaded bars mark US recessions (NBER definition).

Sources: BIS locational banking statistics by nationality; BIS calculations. Graph 1

Banks' holdings of international debt securities



[1] BIS reporting banks' international debt securities claims on non-banks located in the countries shown in the legend. In trillions of US dollars at constant Q4 2007 exchange rates. [2] The shaded area represents banks' cross-border debt securities claims on non-banks located in the United States, reported in the BIS locational banking statistics. The lines show claims (loans and debt securities) on the US public sector, reported in the BIS consolidated banking statistics. Claims on an IB basis include claims (in all currencies) on the public sector booked by offices outside the United States, plus locally booked claims in foreign currencies. Claims on a UR basis also include US dollar-denominated claims booked by the US offices of foreign banks. In both series, part of the recent decline is due to a reclassification in reporting (see next footnote); in trillions of US dollars. [3] Consolidated (UR basis) claims (loans and securities) on the US public sector reported by those banks listed in the legend; in billions of US dollars. The decline in Japanese banks' reported holdings in part reflects a reclassification of claims from the public sector to the non-bank private sector in the fourth quarter of 2007.

Source: BIS locational banking and consolidated banking statistics. Graph 2

growing from less than $12 trillion at end-2000 to more than $37 trillion by end-2007.

Loans to non-bank borrowers expanded since 2000 ...

Growth in credit to non-bank borrowers contributed greatly (39%, or $10 trillion) to this expansion. This development coincided with the rise of the structured finance industry, the expansion of banks' proprietary trading activities and the growth in their hedge fund prime brokerage business. Banks' claims (primarily loans) on non-bank entities increased from less than $4 trillion at end-1999 to $14 trillion by the end of 2007, with claims on non-bank borrowers located in the United States, the United Kingdom and the Cayman Islands accounting for 21%, 16% and 6% of these positions, respectively.

... as did debt security claims

A substantial share (33%, or $4.6 trillion) of banks' total international claims on the non-bank sector are holdings of international debt securities (Graph 2, left-hand panel). While holdings of European government bonds account for much of this, holdings of securities issued by non-banks in major financial centres, including the United States, the United Kingdom and the Cayman Islands, make up nearly $2 trillion of the total. Many of the claims vis-à-vis the United States are international holdings of US Treasury securities and other claims on US government-owned entities. However, a rough estimate, obtained by subtracting claims on the US public sector reported in the consolidated banking statistics (IB basis), suggests that the share of banks' cross-border holdings of debt securities issued by US non-bank *corporates*,

which includes debt issued by investment vehicles and securitised mortgage products, has been on the rise (Graph 2, centre panel).[3]

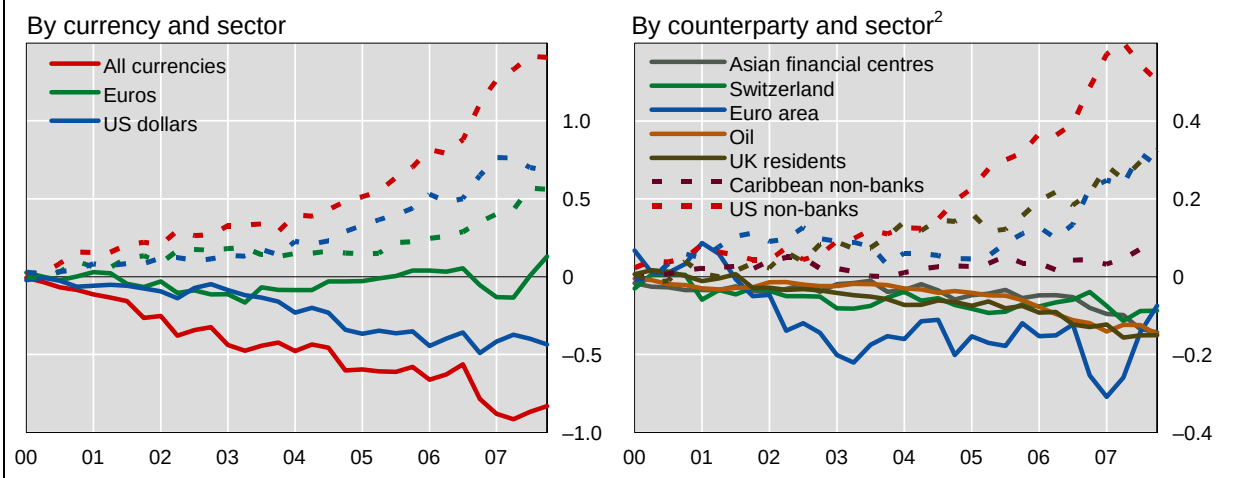
Roughly one quarter of the overall increase in banks' total international assets since end-1999 has been booked by banks located in the United Kingdom. Since then, net claims (claims minus liabilities) of these banks on non-bank borrowers have grown by more than $1 trillion (to $1.5 trillion), half of which is denominated in US dollars. At the same time, their net liabilities to banks increased by a similar amount (to $1.7 trillion), a *sectoral transformation* which is portrayed in Graph 3 (left-hand panel). As shown in the right-hand panel, the growth in net liabilities to banks in Switzerland, the euro area, Asian offshore centres and oil-exporting countries has been used to finance claims on non-banks, primarily in the United States.

US banks channel US dollars to the interbank market …

Which national banking systems have been behind this sectoral transformation? The BIS locational statistics by *nationality* allow for a (partial) reconstruction of the global balance sheets of banks of a given nationality, thus providing some information, albeit incomplete, on these banks' net funding

Cumulative net claims of banks in the United Kingdom[1]

In trillions of US dollars



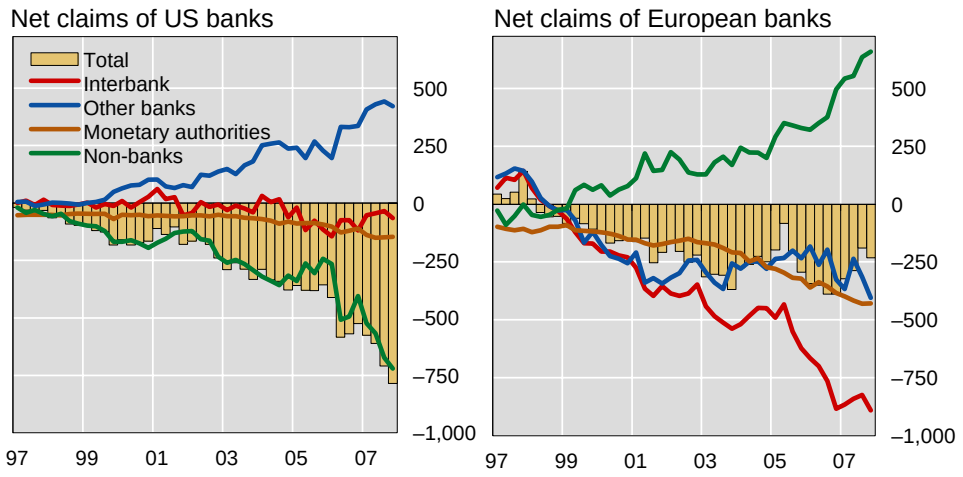
[1] Net claims are claims minus liabilities, expressed at constant end-Q4 2007 exchange rates. These flows are estimated by combining data from several reporting countries, which helps in identifying the residency of the holders of banks' debt security liabilities. Thick lines refer to cumulative net interbank claims and dotted lines to cumulative net claims on non-banks, booked by banks located in the United Kingdom. [2] Asian financial centres = Hong Kong SAR, Macao SAR and Singapore; Caribbean financial centres = Aruba, Bahamas, Bermuda, Cayman Islands, Netherlands Antilles and Panama; Euro area = euro area member states excluding Slovenia; Oil = OPEC member states (excluding Indonesia) plus Bahrain and Russia.

Source: BIS locational banking statistics by residency. Graph 3

[3] The comparison between the consolidated and locational statistics in the centre panel of Graph 2 should be interpreted with caution for several reasons. First, the locational statistics include a larger set of reporting countries than the consolidated statistics. Second, the consolidated statistics include both loan and debt securities claims on the US public sector (although the former are likely to be a small share of the total). Finally, the locational statistics include cross-border holdings by foreign offices of US-headquartered banks, while the consolidated statistics do not.

US dollar positions by bank nationality[1]

In billions of US dollars



[1] Net claims are claims minus liabilities. The interbank component (red line) is broken down into claims on affiliated foreign offices (not shown), claims on other banks and claims on official monetary authorities. Net claims booked by offices located in all BIS reporting countries are aggregated by the parent region indicated in the panel heading.

Source: BIS locational banking statistics by nationality. Graph 4

requirements in a particular currency.[4] Overall, these data indicate significant differences in the global claims patterns of European and US banks. Graph 4 portrays aggregated net claims, broken down by sector, booked by offices of US and European banks located in all reporting countries.[5] As shown in the left-hand panel, US banks have borrowed US dollars from non-banks, and have channelled these funds to other (unaffiliated) banks in the interbank market. By mid-2007, their total net claims on other banks (excluding inter-office claims) reached $443 billion, up from virtually nil in 1999.

… to fund European banks' investments in non-banks

At the same time, European banks have borrowed from other banks to fund US dollar investments in non-banks (Graph 4, right-hand panel). Their net liabilities to all banks, which include both uncollateralised loans and repo financing, grew to more than $800 billion by end-2007, much of this vis-à-vis other banks and official monetary authorities. These funds were channelled into credit to non-banks. A closer look at the underlying data reveals that the US dollar-denominated net claims on non-banks booked by offices of German, UK and Swiss banks in the United Kingdom have expanded by a combined $499 billion since 2000.

[4] The *BIS locational statistics by nationality* provide, for each reporting country, banks' total cross-border positions (in all currencies) and positions vis-à-vis residents (in foreign currencies), broken down by the *nationality of the parent bank*. Positions are broken down by sector (non-bank, other bank and inter-office) and by currency, but not by residency of the borrower.

[5] These data should be interpreted with caution since they exclude US dollar-denominated claims on residents booked by offices in the United States and claims on all counterparties booked by offices in non-reporting countries. The figures presented in Graph 4 tracking net claims on "other banks" exclude inter-office borrowing. However, the US dollar positions reported by France and Germany do not distinguish these from inter-office positions, and are treated as positions vis-à-vis "other banks".

These diverging positions of US and European banks suggest that the latter face relatively large US dollar funding requirements. This may help in understanding the liquidity squeeze in this market since mid-2007. Indeed, market commentary has suggested that European banks in particular had difficulty obtaining US dollar funding as the tensions in the interbank market unfolded in the second half of 2007 (Baba et al (2008)).[6] Interbank borrowing tends to be short-term, whereas banks' investment in non-banks is of varying maturities. While the associated term risk may have been hedged, the build-up of European banks' US dollar liabilities to other banks used to fund their US dollar non-bank assets may have required a frequency of rollovers in the interbank market that became difficult to maintain as market volatility increased.

Developments in the second half of 2007

The turmoil in financial markets which erupted in mid-2007 produced widespread losses and had a severe and immediate impact on interbank markets. Interbank rates in various jurisdictions and currencies remained elevated through May 2008, despite the unprecedented steps taken by central banks to enhance market liquidity (Borio and Nelson (2008), Michaud and Upper (2008)). The size and structure of internationally active banks' exposures to US mortgage-related structured products was not well understood, and the impact of the turmoil on interbank markets was not anticipated.

Global activity remains robust …

The global perspective afforded by the BIS international banking statistics sheds some light on these aspects of the current turmoil. The data for the second half of 2007 contain few signs of an abrupt retreat from international lending. Indeed, yearly growth in overall claims only began to fall in the fourth quarter of 2007 (although claims of some banking systems dropped noticeably; see the next section). Moreover, total international claims grew by $2.2 trillion in the second half of 2007, with interbank activity accounting for a stable share (62%).

… although investments in US non-banks waned

That said, there are significant movements in the data which appear to be related to the turmoil. Banks located in the United Kingdom began to reduce their net long positions on non-banks in the United States discussed in the previous section (Graph 3, right-hand panel). Between end-June and end-December 2007, their gross claims on non-banks in the United States fell by $77 billion. Similarly, banks in offshore centres, primarily the Cayman Islands, reduced their claims on non-banks in the United States, by $14 billion. The BIS consolidated statistics, which aggregate worldwide claims of banks headquartered in a particular country, show that European-headquartered (primarily Swiss, Dutch, Belgian and Irish) banks' foreign claims on the non-bank private sector in the United States dropped by $283 billion in the second

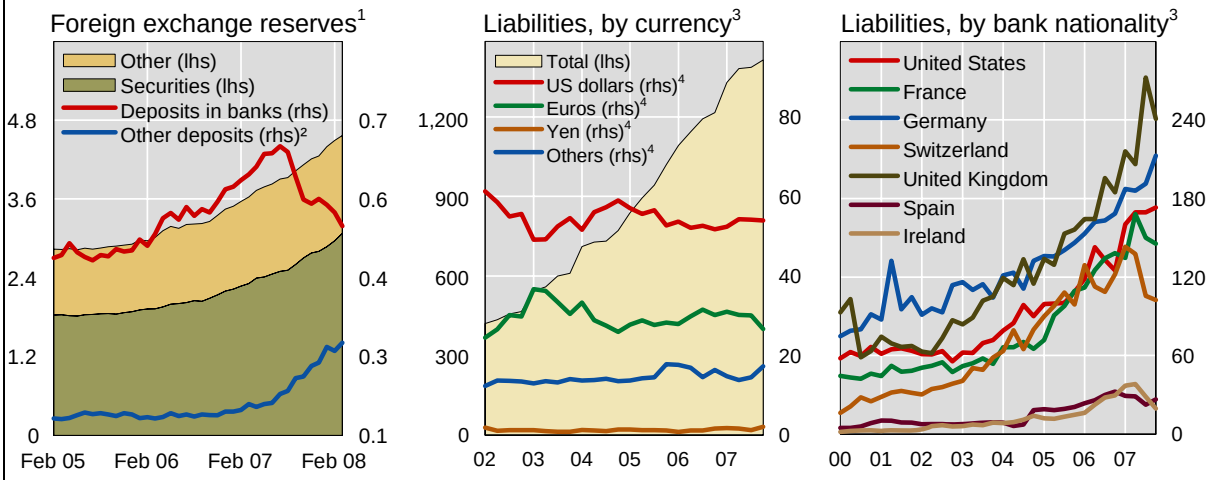
[6] In an effort to alleviate European banks' US dollar shortage, the ECB and the Swiss National Bank entered into a reciprocal currency arrangement with the Federal Reserve in order to provide dollars to their counterparties.

half of 2007. These contractions in credit stand in sharp contrast to the unusually large expansion in credit to emerging markets in the second half of 2007 (see Highlights section on page17).

Some central banks withdraw reserves …

Despite the efforts of central banks to enhance market liquidity, a number of official monetary authorities reduced their holdings of foreign exchange reserves in the international banking system. Such reserve placements have become a significant source of funding for both US and European banks (Graph 4); reporting banks' total liabilities vis-à-vis these entities reached $1.4 trillion at the end of 2007, up significantly since 2002 (Graph 5, centre panel). However, IMF data on foreign exchange reserves held in banks abroad show significant decreases for some countries since mid-2007 (Graph 5, left-hand panel). For example, the monetary authorities in Australia, Brazil, Chile, the Czech Republic, India, Russia and the United Kingdom reported a combined decline of $109 billion in this stock. Further reductions brought this total to $161 billion by the end of the first quarter of 2008.[7] Consistent with this, the BIS banking statistics indicate that overall growth in reporting banks' liabilities to official monetary authorities slowed.[8] Deposit liabilities reported by the offices of Swiss, French and Irish banks in all reporting countries fell the most in the second half of 2007 (by $35 billion, $23 billion and $17 billion, respectively). Similarly, deposits placed in UK-headquartered banks exhibited a noticeable decline in the fourth quarter.

Deposits placed by official monetary authorities



[1] Holdings of foreign exchange reserves by 63 monetary authorities which report SDDS data to the IMF; in trillions of US dollars. [2] Currency and deposits with other national central banks, the BIS and the IMF. [3] Liabilities booked by BIS reporting banks vis-à-vis official monetary authorities; in billions of US dollars; expressed at constant end-Q4 2007 exchange rates. [4] As a percentage of total liabilities.

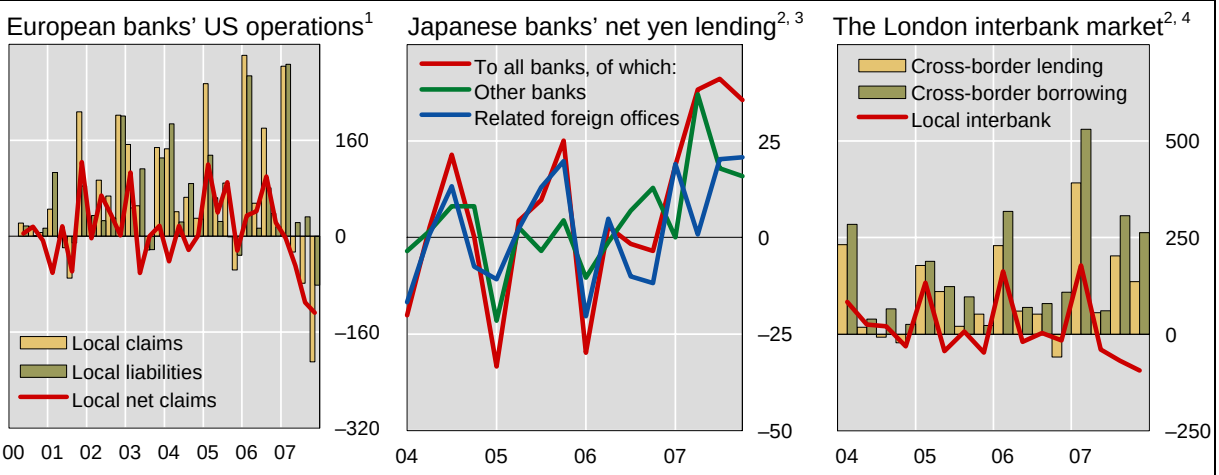
Sources: BIS locational banking statistics by residency and nationality; IMF. Graph 5

[7] Across all countries reporting these data, the overall decrease in the second half of 2007 came to $92 billion. By end-March 2008, the overall decrease reached $149 billion.

[8] The BIS statistics include reporting banks' positions vis-à-vis official monetary authorities in all countries (aggregated), not only those countries which provide a more detailed breakdown of their reserve holdings in the IMF Special Data Dissemination Standard (SDDS) templates.

Global search for funds

In billions of US dollars



[1] Change in local currency positions on US residents booked by European banks' offices in the United States, reported in the BIS consolidated banking statistics (IB basis). [2] Flows expressed at constant end-Q4 2007 exchange rates. [3] Change in Japanese banks' cross-border yen positions booked by their offices in Japan and the euro area, from the locational banking statistics by nationality. [4] Change in lending and borrowing by banks (all nationalities) located in the United Kingdom, split into cross-border interbank transactions and local interbank transactions (excluding sterling), from the locational banking statistics by residency.

Source: BIS consolidated and locational banking statistics. Graph 6

… even as commercial banks mobilise liquidity

Against this backdrop, the pattern of cross-border interbank flows, across locations and currencies, suggests that banks sought to mobilise liquidity, especially in the US dollar market segment. They tapped their foreign affiliates, scaled back their local operations in the United States and borrowed from those banking systems which seemed to be less affected by the turmoil. European banks in particular reduced their US dollar claims booked by their offices in the United States (Graph 6, left-hand panel), resulting in an estimated net outflow from these offices of $239 billion in the second half of 2007. At the same time, banks have put their US Treasury holdings to work to raise funds, as evidenced by the significant decline in holdings in 2007 (Graph 2, right-hand panel), especially for those European banking systems known to be affected by the turmoil, such as Swiss banks. In contrast, Japanese banks, which were less affected by the turbulence, channelled funds into the interbank market from their headquarters in Japan, as evidenced by a surge in their net yen-denominated lending to affiliated offices and other banks abroad (Graph 6, centre panel).[9]

Banks channel funds to London

The international redistribution of funds between deficit and surplus banks in various locations contributed to an expansion in overall interbank claims, much of which were targeted at banks located in London. Accordingly, the volume of *cross-border flows* in and out of the United Kingdom remained robust, with banks located there lending $336 billion to, and borrowing $564 billion from, banks abroad after the onset of the turmoil. The difference of

[9] Swiss banks contributed dollar and euro funding, possibly as a result of prearranged credit lines being drawn down. The consolidated banking statistics on an ultimate risk basis show that the substantial increases in Swiss banks' interbank loans to their German, UK and US peers were matched by equivalent declines in credit commitments outstanding.

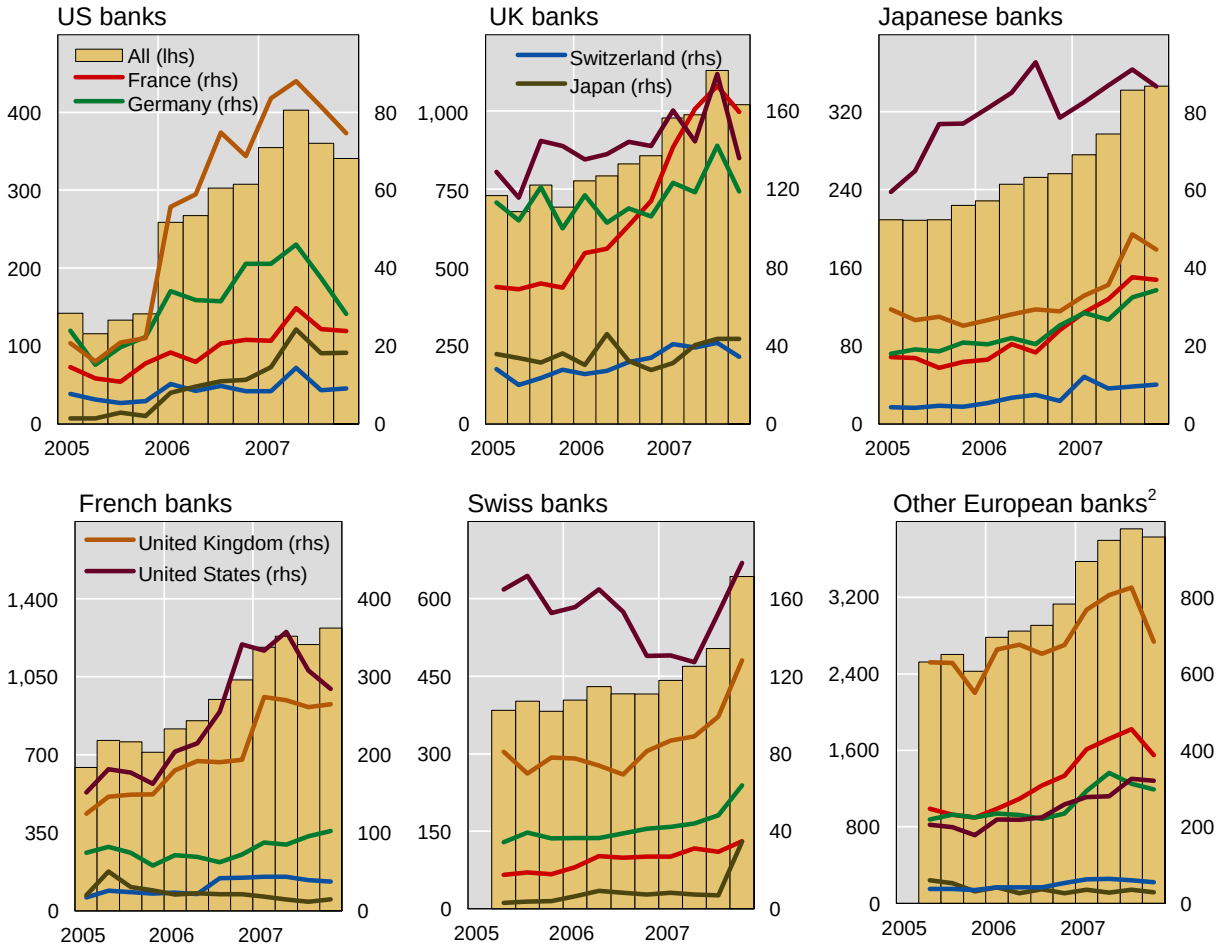
$228 billion represents a net inflow of funds from banks abroad (Graph 6, right-hand panel). However, banks in London apparently did not extensively recycle the additional funds supplied to them from offshore but may have hoarded the liquidity, as evidenced by the observed shrinkage in local interbank positions (Graph 6, right-hand panel). Foreign currency lending *between* banks within the United Kingdom contracted by $154 billion (or 15%) during the second half of 2007 (primarily in the US dollar and euro segments), suggestive of heightened concerns about credit and counterparty risk, a topic taken up in the next section.

Bilateral exposures of national banking systems

From the preceding focus on funding and liquidity risk, this section shifts the discussion to an analysis of counterparty risk in the interbank market. From this perspective, the BIS consolidated statistics on an ultimate risk (UR) basis

Bilateral interbank exposures of selected banking systems[1]

By bank nationality, in billions of US dollars



[1] Shaded bars indicate total interbank exposures of reporting banks headquartered in selected countries (panel headings). Lines indicate foreign claims vis-à-vis banks of the nationality indicated by the legend, where nationality is defined by the residency of the ultimate obligor. Data are not adjusted for exchange rate changes. Spanish and Swiss banks began reporting in Q2 2005. [2] Austrian, Belgian, Danish, Dutch, Finnish, German, Greek, Italian, Irish, Norwegian, Portuguese, Spanish and Swedish banks.

Source: BIS consolidated banking statistics on an ultimate risk basis. Graph 7

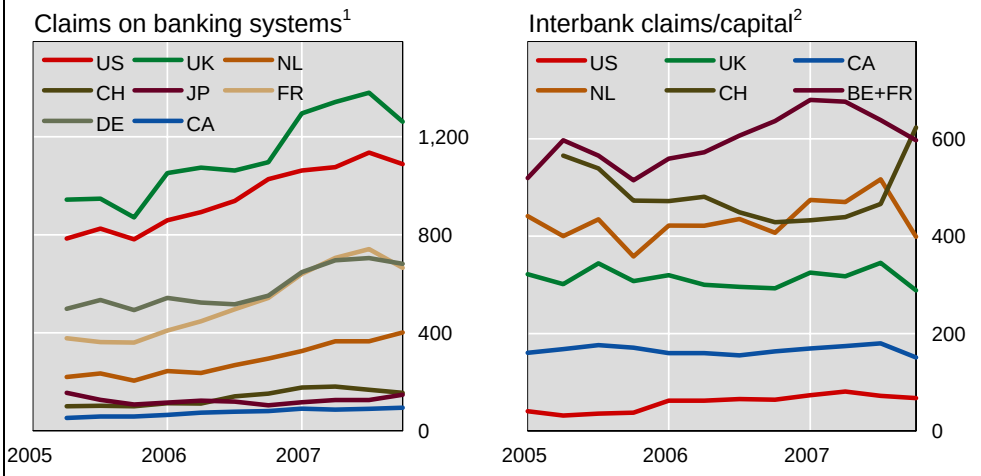
provide relevant information at the level of national banking systems, including both cross-border and local positions. These statistics can be used to track *bilateral* positions of national banking systems, where nationality is defined as the country of residence of the bank headquarters (regardless of the location of their respective offices), thus shedding light on the overall structure of global interbank exposures.[10]

Many of the bilateral interbank exposures in the international banking market have expanded significantly since 2005 (Graph 7). By the second quarter of 2007, French banks' claims on US and UK banks had grown to $357 billion and $270 billion, respectively. Similarly, UK-headquartered banks' exposures to French, German and US banks each exceeded $120 billion by mid-2007. By contrast, US-headquartered banks' foreign claims on other banking systems are relatively small. Although their overall exposures reached $403 billion by mid-2007 (from $116 billion in 2005), exposure to individual national banking systems never exceeded $100 billion.

Interbank exposures contracted …

Tentative signs of a credit contraction in some segments of the interbank market emerged in the second half of 2007. Claims on UK, French and US banks dropped the most, followed by those on German and Swiss banks

Global interbank exposures



Banks headquartered in CA = Canada; CH = Switzerland; DE = Germany; FR = France; JP = Japan; NL = Netherlands; UK = United Kingdom; US = United States; BE + FR = Belgian and French banks combined. The ratios in the right-hand panel are computed using Tier 1 capital of internationally active banks reporting the consolidated banking statistics. Semiannual balance sheet data (CH, FR, UK) are converted to quarterly frequency by interpolation (cubic spline) up to the most recent available quarter. Data are not adjusted for exchange rate changes, since currency breakdowns are not reported in the consolidated banking statistics.

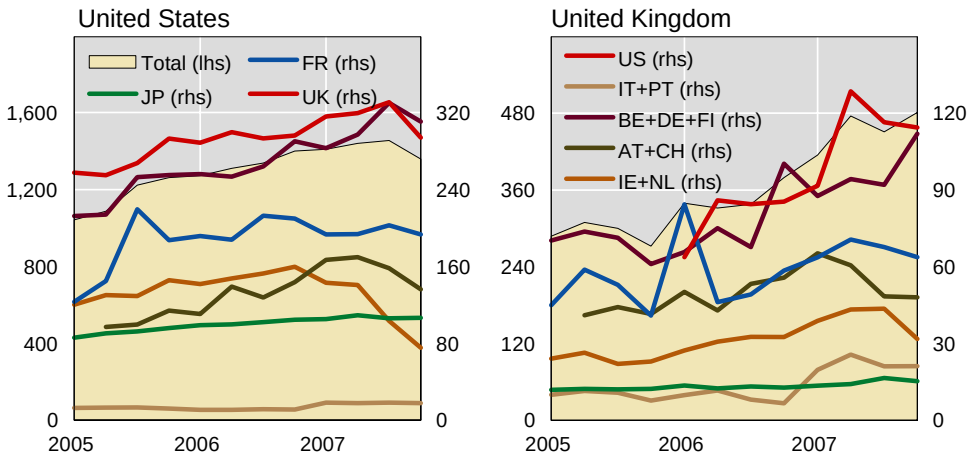
[1] Foreign claims by domestically owned banks in all reporting countries on the national banking systems identified in the legend, in billions of US dollars. [2] Foreign claims on unaffiliated banks reported by banks of the nationality identified in the legend, as a percentage of their Tier 1 capital.

Source: BIS consolidated banking statistics on an ultimate risk basis. Graph 8

[10] For example, on a UR basis, interbank claims reported by the United States vis-à-vis the United Kingdom provide an estimate of US banks' global claims on UK banks (as opposed to US banks' claims on banks located in the United Kingdom, as in the BIS consolidated statistics on an immediate borrower (IB) basis). See McGuire and Wooldridge (2005) for a description of the BIS consolidated banking statistics.

Credit commitments[1]

In billions of US dollars



AT+CH = Austria and Switzerland; BE+DE+FI = Belgium, Germany and Finland; FR = France; IE+NL = Ireland and Netherlands; IT+PT = Italy and Portugal; JP = Japan; UK = United Kingdom; US = United States.

[1] Unused credit commitments booked by BIS reporting banks of the nationalities shown in the legend, vis-à-vis entities (banks and non-banks) of the nationalities of the panel headings, on an ultimate risk basis. The initial starting values for Austria, Spain, Sweden, Switzerland and the United States are backcasted when calculating the total prior to their reporting of credit commitments. For a description of credit commitments and other contingent exposures in the BIS statistics, see McGuire and Wooldridge (2005).

Source: BIS consolidated banking statistics on an ultimate risk basis. Graph 9

(Graph 8, left-hand panel).[11] US banks, in turn, trimmed their exposures to almost all major banking systems, particularly UK and German banks, reducing total foreign claims on the banking sector by $62 billion (Graph 7). This was the first substantial decline in interbank claims reported by US banks since the inception of the ultimate risk statistics (Q1 2005). UK banks' foreign claims also contracted in the fourth quarter, particularly vis-à-vis US, German, French and Swiss banks. The single largest reduction in bilateral interbank exposures in the second half of 2007 was reported by French banks vis-à-vis US banks, at $73 billion.

... as did credit commitments

Similarly, while foreign credit commitments booked by BIS reporting banks remained flat overall, those extended to borrowers in advanced economies have declined since the onset of the turmoil.[12] In particular, several banking systems reduced these contingent exposures vis-à-vis entities in the United States and the United Kingdom (Graph 9). Vis-à-vis the latter, US banks reduced their commitments the most (by 11%). The 6% drop in commitments vis-à-vis the United States was the first on record, and was reported quite uniformly across several major banking systems. As entities draw down existing lines, credit commitments should fall as claims rise. However, in this case, the drop seems to signal a more general retreat by some banking

[11] This occurred in spite of a positive valuation effect. The depreciation of the US dollar over the period tends to overstate end-of-period stocks of other currencies when expressed in dollars.

[12] Credit commitments stand at $4.7 trillion (UR basis), or 17% of total foreign claims.

systems (eg Dutch and Swiss banks), since the fall in their credit commitments to US entities coincided with a reduction in their foreign claims (especially vis-à-vis non-banks).

This recent contraction notwithstanding, the size of banks' foreign exposures remains quite large for some national banking systems. Scaled by their total assets (ie including domestic assets), banks' foreign exposures (to all sectors) have been relatively stable for most banking systems since at least 2005, but the levels differ greatly. For example, foreign exposures (UR basis) account for less than 20% of US banks' total assets, 30–50% of Canadian, UK, Belgian and French banks' total assets, and over 50% of Swiss and Dutch banks' total assets.

Interbank exposures are large relative to Tier 1 capital

Perhaps more importantly, *interbank* exposures remain large relative to capital, even after taking into account the recent contraction (Graph 8, right-hand panel). US banks' interbank exposures are relatively small, at roughly 67% of their Tier 1 capital, although up from 37% at end-2005. At the other end of the spectrum are Swiss, Belgian and French banks, with their respective international interbank exposures at six times their Tier 1 capital. During the second half of 2007, the only major banking system to report a decline in Tier 1 capital for its internationally active banks was Switzerland. Swiss banks also expanded their global interbank claims the most (by $174 billion), thus driving up their ratio of interbank claims to capital. Other major systems reduced their respective ratios by matching higher capital with a moderate expansion or, in the case of Canadian, Dutch, UK and US banks, an outright contraction in global interbank claims by the end of 2007.

Concluding remarks

This feature has explored the impact the financial market turmoil had on international banking activity through end-2007. European banks, which had significantly expanded their claims on US non-banks since 2000, were confronted with large dollar funding needs at a time when their exposure to US mortgage-related products cast a shadow on their financial condition. As a result, the pattern of international banking flows since the onset of the turmoil conveys a picture of a global search for funds, especially in the US dollar segment. Moreover, there are signs that national banking systems started to unwind their international exposures, especially their claims on other banking systems and their exposures to US non-bank entities.

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