III. The financial sector under stress

Financial sector firms were subjected to extreme stress during the period under review. The turmoil that originated in the subprime mortgage market in early 2007 gradually developed into a full-fledged crisis that reached historic proportions in mid-September 2008. Financial institutions entered a protracted period of illiquidity in asset and funding markets, and suffered outsize losses. A number of firms failed. Chief among them was Lehman Brothers, whose bankruptcy played a catalytic role in the dynamics of the crisis (see Chapter II). Other institutions came to the brink of bankruptcy before being taken over by larger firms or the public sector. The size and nature of policy interventions were unprecedented.

Over the medium term, the health of financial firms will depend on the interplay between their response to losses and the dynamics of the macroeconomy. The feedbacks between the two become particularly strong when the capital cushions of financial firms are depleted. In the first stage of the crisis, capital raised from private investors met the cost of writedowns on securities portfolios. In subsequent stages, private capital had to be supplemented on a large scale by public sector resources to address mounting losses on institutions' loan books driven by rapidly deteriorating macroeconomic conditions. The pace and shape of recovery will be critically linked to the ability of financial firms to manage their leverage and capital positions in a challenging environment without unduly restricting the flow of credit to the economy.

From a longer-term perspective, the crisis carries important messages for the structure and stability of the financial system. The events of the past two years highlighted how strong the interdependencies between financial system components can become. Market participants and also, arguably, prudential authorities underestimated the complementarities in the roles of different actors along the securitisation chain, the close interlinkages among financial markets and institutions, and the interplay between asset market and funding liquidity.

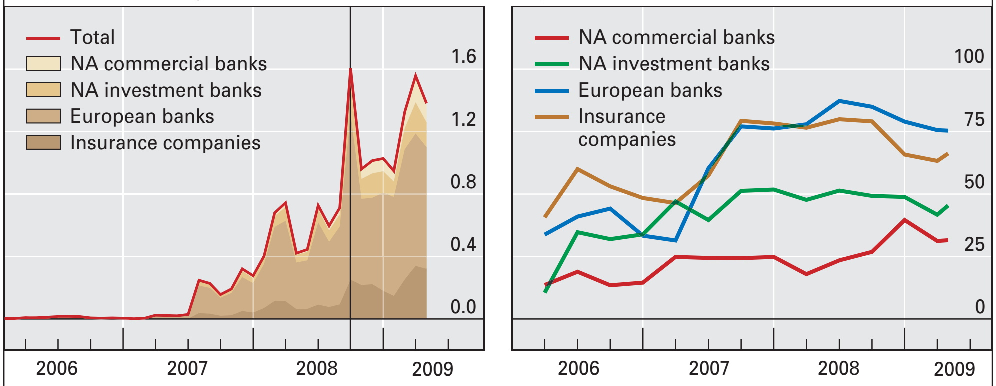
Decisions taken by private sector participants and policymakers in dealing with the crisis will help shape the future structure of the financial sector. Their actions will, for instance, influence not only the speed with which intermediation activity adjusts to the availability of capital at the current juncture, but also the type of institutions that will emerge from the crisis. Private and public sector decisions will also determine whether the secular trend towards greater international openness will continue or stall.

Financial firms under stress

The performance of financial firms deteriorated sharply last year. Writedowns rose further from the levels registered in the first stage of the crisis prior to

Price of insurance against systemic distress[1]

By financial segment[2] | Importance of a common driver[3]



[1] Based on credit default swap (CDS) spreads for 10 commercial and eight investment banks headquartered in North America (NA), 16 universal banks headquartered in Europe and 14 insurance companies headquartered in the United States and Europe; in per cent. [2] The "Total" line plots the risk neutral expectation of credit losses that equal or exceed 5% of the four financial segments' combined liabilities in 2008 (per unit of exposure to these liabilities). Risk neutral expectations comprise expectations of actual losses and preferences. The shaded areas portray how the total is allocated among the four financial segments. The vertical line marks September 2008, the month in which Lehman Brothers filed for Chapter 11 bankruptcy protection. [3] The average share of institutions' asset return volatility accounted for by a risk factor that is common to all four financial segments.

Sources: Bankscope; Bloomberg; Markit; BIS calculations. Graph III.1

A systemic crisis

March 2008. Revenues fell and funding costs surged. The crisis affected a wide array of institutions across a number of countries. The stress on the financial system was compounded by the feedback effects of a rapid decline in global economic activity, which put further pressure on balance sheets and revenues.

Market participants' growing concern about financial sector solvency was reflected in the soaring costs of insurance against the default of individual large firms and the system more broadly. Premia on credit default swaps (CDS) referencing those firms widened across segments and geographical jurisdictions. The market price of insurance against systemic-scale losses in the financial sector increased in waves. It reached new heights during the third and most acute stage of the crisis, starting in mid-September 2008, doubling from the previous peak of six months earlier (Graph III.1, left-hand panel). The systemic nature of the episode is reflected in the increased importance of a common driver of default risk across the different segments of the global financial sector. This has been particularly noticeable for insurance companies and European banks (Graph III.1, right-hand panel).

Bank profitability

Banks' earnings plummeted …

The profitability of banks plunged last year owing to the realisation of losses on marked to market (securities) portfolios and the progressive deterioration of loan books as the economic slump deepened. Although the decline in bank profits was a global phenomenon, the way banks have been affected by the crisis has differed somewhat according to the circumstances in their respective home markets.

… in the United States …

Banks in the United States saw their pre-tax profits in 2008 more than halved compared with the previous year (Table III.1). The full-year results, however, conceal the sharp deterioration in the second half. For example, one in three US banks lost money in the fourth quarter, and the sector as a whole recorded its first quarterly loss since 1990. Net interest margins also came under pressure, especially for smaller banks that found it hard to reduce their deposit rates. There was a surge in US bank failures in 2008. A total of 25 deposit-taking institutions failed, with combined assets of $372 billion, about 10 times higher than during the previous peak in bank failures in 1993. The failure of Washington Mutual accounted for $307 billion of the total and was the largest US bank failure in history (Table II.1). The bank was eventually absorbed by JPMorgan Chase, another large bank, with the assistance of the supervisory authorities. Besides the failed banks, the number of institutions on the US deposit insurer's list of problem banks swelled to 252 with total assets of around $159 billion. Further large failures were averted as weakened institutions were acquired by others with healthier balance sheets.

… and Europe

In Europe, the general picture of bank performance in 2008 was broadly similar to that in North America. Profits plummeted across the board, and as a group the largest banks in the Netherlands, Switzerland and the United Kingdom registered a net loss. The size of the earlier residential property boom in Ireland, Spain and the United Kingdom posed an especially large challenge to banks in those countries once real estate markets slowed. Certain German banks were also affected by real estate exposures, albeit mainly indirectly through securities positions and exposures to commercial property. French and Italian banks were less affected by losses on structured finance investments, given their stronger focus on the domestic retail market.

Profitability of major banks[1]

As a percentage of total average assets

	Pre-tax profits			Net interest margin			Loan loss provisions			Operating costs		
	2006	2007	2008	2006	2007	2008	2006	2007	2008	2006	2007	2008
Australia (4)	1.54	1.42	0.95	1.87	1.70	1.66	0.12	0.13	0.26	1.56	1.38	1.51
Austria (3)	1.48	1.12	0.66	1.72	1.95	2.10	0.34	0.24	0.45	2.17	2.11	2.29
Canada (5)	1.22	1.12	0.48	1.52	1.48	1.42	0.09	0.13	0.21	2.37	2.27	2.00
France (5)	0.73	0.41	0.05	0.59	0.49	0.70	0.05	0.09	0.21	1.20	1.19	1.23
Germany (6)	0.43	0.25	–0.41	0.51	0.51	0.63	0.05	0.05	0.19	0.96	0.88	1.18
Italy (5)	1.05	0.88	0.29	1.77	1.68	1.94	0.25	0.25	0.42	2.18	1.99	2.31
Japan (13)	0.46	0.29	0.12	0.48	0.49	0.50	0.04	0.11	0.19	0.49	0.55	0.65
Netherlands (4)	0.48	0.30	–0.79	1.03	0.85	0.96	0.10	0.09	0.27	1.13	1.01	1.33
Spain (5)	1.37	1.44	1.10	1.64	1.72	1.83	0.31	0.37	0.53	1.75	1.77	1.89
Sweden (4)	0.96	0.89	0.67	0.98	0.97	0.99	–0.02	0.02	0.11	0.99	0.96	1.00
Switzerland (6)	0.80	0.38	–1.94	0.51	0.53	0.49	0.00	0.03	0.07	1.53	1.78	2.55
United Kingdom (9)	0.90	0.74	–0.10	1.16	1.02	0.81	0.25	0.22	0.40	1.56	1.37	1.28
United States (9)	1.71	0.98	0.36	2.35	2.28	2.16	0.19	0.51	1.11	2.95	3.31	3.44

[1] The number of banks in the 2008 sample (for total assets) is indicated in parentheses. For UniCredit Bank Austria and all Japanese banks, 2008 data refer to September observations.

Source: Bankscope. Table III.1

Continental European banks, in contrast to their UK peers, partially cushioned losses through an increase in their net interest margins.

Bank failures

A number of European lenders averted outright bankruptcy thanks to direct support from the public sector (see Chapter VI for a discussion on financial sector rescue packages). Of particular interest was the case of the banking and insurance company Fortis. Its substantial cross-country operations were split as a result of the intervention by the prudential authorities and the support that it required from the public purse. In Germany, the crisis gave some impetus to the restructuring of the domestic banking sector. It acted as a catalyst for a number of mergers between lenders, including some of the country's Landesbanken, while the government encouraged further mergers as a condition for the financial support it provided to the industry.

Having put the loan problems of the previous decade behind them, Japanese banks were thought to be in a position to gain from the weaknesses of their international competitors. They started 2008 showing relative resilience to the troubles of their peers in other advanced economies because of smaller exposures to subprime and structured products. Some of the larger lenders made tentative investments in the recapitalisation of foreign banks. Nevertheless, the profitability of Japanese banks remained poor, partly because of their structurally narrow net interest margins. Consequently, their capital base remained weak. And any plans for international expansion were put on hold in the second half of the year when the domestic economy fell into recession and losses intensified.

Composition of bank losses

As the macroeconomic situation worsened over the course of the past year, institutions faced increasing pressure on earnings and mounting losses on their credit risk exposures. The shifting composition of bank losses reflected the evolution in the character of the problems confronting the industry.

Early marked to market losses …

During the first stage of the crisis, writedowns were closely linked to traded portfolios of structured finance products and securitised exposures to the subprime mortgage market. Losses were exacerbated by illiquidity in the markets for those instruments, which led to substantial reductions in their marked to market valuations (see Chapter II and Table III.2). While there was considerable uncertainty about the magnitude of the losses and their distribution across the system, they were perceived as being contained within a certain class of assets.

… gave way to credit losses as the recession deepened

The general economic slowdown that ensued in the later stages of the crisis, in particular after the global crisis of confidence in September and October 2008, meant that bank losses became more closely connected to macroeconomic performance. In this period, the majority of writedowns were more directly linked to a surge in borrower defaults (Graph II.6, left-hand panel; Graph IV.5, right-hand panel) and to anticipated defaults as evidenced by the increase in the amount and relative importance of provisioning expenses.

Loan loss provisions as a fraction of bank assets were universally higher in 2008 than in previous years (Table III.1). Compared with 2007, the rate at least doubled for Australian, French, Swiss and US banks and jumped even

Composition of announced bank losses[1]

In billions of US dollars

	Q3–Q4 2007	Q1–Q2 2008	Q3–Q4 2008	Q1 2009
Securities	120.5	97.0	106.1	21.0
Provisions	39.2	96.9	149.3	43.9
Real estate	3.2	11.6	55.9	3.0
Leveraged loans	8.3	16.4	10.4	2.0
Monolines	7.4	26.5	13.7	13.3
Other	27.4	47.7	100.4	10.6
Total	206.0	296.0	435.8	93.7

[1] Writedowns in original currency converted to US dollars at end-of-period exchange rates. The classification is based on disclosures by large international banks that may not be perfectly comparable across reporting institutions.

Sources: Bloomberg; BIS calculations. Table III.2

higher in the case of German, Dutch and Swedish lenders. Credit costs are likely to continue on an upward trajectory as weakening economic activity will probably impair the private sector's ability to service debt. Rating agencies expect corporate default rates to increase further. In addition, the performance of banks' household credit portfolios will depend on the length and depth of the contraction in incomes. Initial signs of problems in US banks' credit card portfolios indicate a stronger pass-through from unemployment to delinquencies than that suggested by historical experience. The close interdependency between financial sector performance, the supply of credit and the debt servicing capacity of borrowers implies greater uncertainty in the overall outlook for banks.

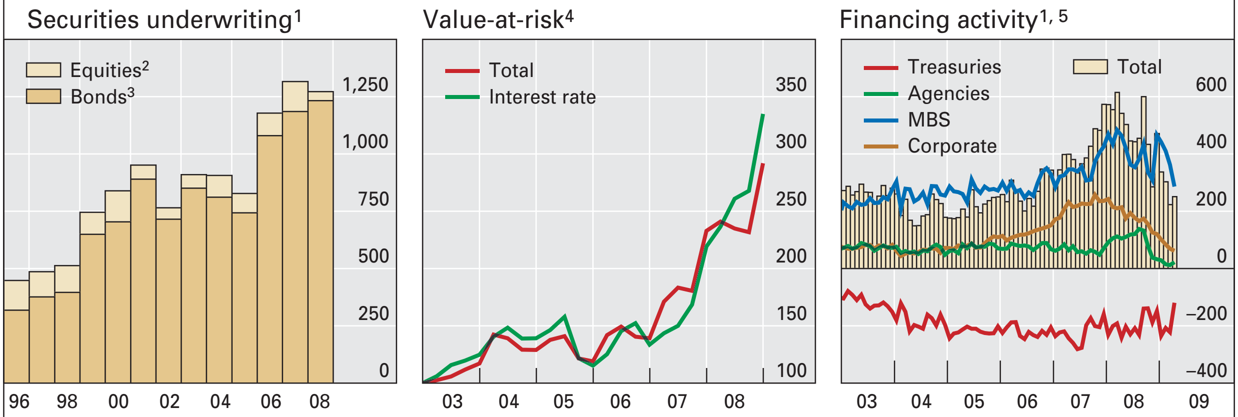
Investment banking

The hostile market environment …

The crisis has left deep scars on the investment banking industry, which was arguably the hardest hit segment of the financial sector. The magnitude of firms' losses combined with a difficult trading and funding environment was especially punishing. Their portfolios were highly exposed to the most affected asset classes. Large holdings of structured securities, including those with the highest risk, and unhedged exposures in the securitisation pipeline were marked down dramatically. The illiquidity of asset and funding markets proved particularly challenging for the investment banking business model. Firms could no longer rely on an increasing volume of transactions to generate revenue growth or on cheap and readily available short-term financing to support high levels of leverage.

Industry observers estimated that net revenue for the largest investment banking operations fell by more than 90% in the third quarter of 2008 compared with the same period a year earlier, as market activity seized up. All lines of business were affected. Securities underwriting declined for the year as primary market issuance slowed and associated revenues fell (Graph III.2). Merger and acquisition advisory business held up better by comparison, although it also slowed in the first quarter of 2009.

Indicators of investment banks' activity and risk



[1] In billions of US dollars. [2] Initial public offerings in Germany, Japan, the United Kingdom and the United States. [3] Completed international debt securities issuance. [4] Market capitalisation-weighted average of eight large institutions' total and interest rate value-at-risk; Q4 2002 = 100. [5] Net financing of US primary dealers, measured by the net amount of funds primary dealers borrow (including through repo transactions) broken down by the fixed income security used; amounts outstanding.

Sources: Federal Reserve Bank of New York; Bloomberg; companies' financial reports; BIS. Graph III.2

… brought an end to standalone investment banks …

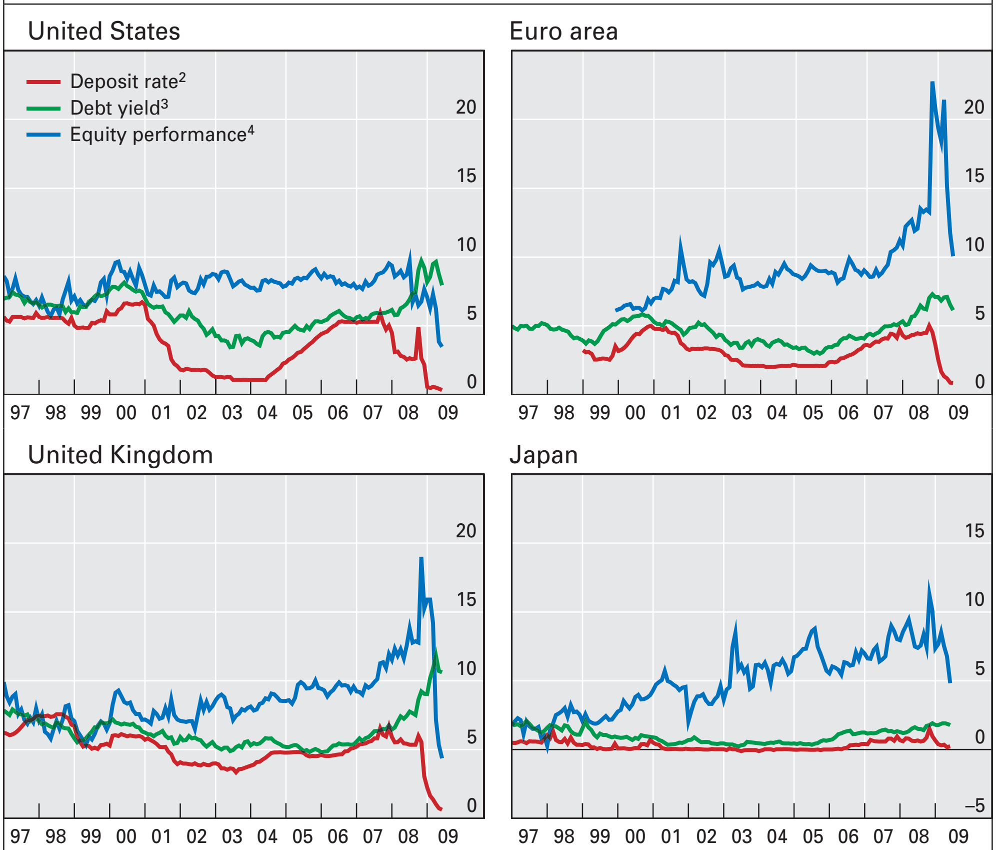
The demise of the standalone investment bank has been a salient feature of the crisis, the second stage of which spanned the period between the March 2008 near collapse of Bear Stearns and the September bankruptcy filing by Lehman Brothers, two of the largest independent firms (see Chapter II). During those six months, all of the other major Wall Street firms either were absorbed under stress by larger banking organisations or took on a banking charter in order to improve their access to the prudential safety net. More generally, investment banking operations were reduced across the board independently of their institutional affiliation. Employment declined radically. Staffing levels at Bear Stearns and Lehman Brothers were cut by more than half as their operations were taken over by other institutions. The staffing cuts at other firms broadly mirrored the size of their realised losses.

… and forced a restructuring

The restructuring of the sector, however, goes beyond headcount. Loss-making firms have been rebuilding their balance sheets while restructuring and reorienting their operations in response to lower fee income and in an effort to reduce leverage and risk. Some have diversified their funding model away from wholesale capital markets towards operationally more expensive but arguably more stable sources, such as deposits. As a result, the volume of securities financing transactions, including through repurchase agreements, has fallen (Graph III.2, right-hand panel).

As larger firms have shrunk in size, albeit not in complexity, smaller specialised operations have emerged. Some were set up by senior staff fleeing the industry leaders either because of restructuring or, given the backlash over executive pay in the financial sector, in anticipation of a reduction in compensation. These smaller, so-called boutique, firms are breaking with past industry strategy that regarded consolidation as the main path to profitability. If successful, they could provide a competitive alternative to larger and more integrated firms, including universal banks that absorbed large, distressed investment banks.

Cost of equity and debt[1]



[1] In per cent. [2] One-month deposit rate. [3] Merrill Lynch broad banking index, yield to maturity. [4] Implied by the ratio of 12-month forward expected earnings to the current stock price.

Sources: Bloomberg; Datastream. Graph III.3

Bank capital and deleveraging

The crisis seriously impaired banks' balance sheets. The losses weakened their capital base and obliged them to raise new capital or preserve existing capital by scaling down their activities.

Banks' capitalisation took a hit …

Banks have struggled throughout the crisis to maintain capitalisation at a level regarded as adequate by markets and supervisors. During the first crisis stage, banks shored up capital by raising funds from various private sector sources. Some issued new rights in public markets, while others struck direct agreements with private investors or foreign sovereign wealth funds. As losses kept mounting through the second and third crisis stages, those sources became increasingly expensive or unavailable. The cost of equity capital, for example, surged as the market value of banks' shares plummeted (Graph III.3). Higher funding costs reflect the uncertainty about the resilience of bank balance sheets and the expectation that the economic slowdown will have an additional negative impact on earnings. Public sector funds, via capital injections and guarantees of bank liabilities, replaced private sector sources in the later stages of the crisis (see Chapter VI).

Banks have generally been expected to raise capitalisation levels, even though their capital ratios at the end of 2008 compared favourably with those seen in the years of rapid balance sheet expansion prior to 2007 (Table III.3). Markets and supervisors have been scrutinising the level as well as the loss absorption quality of banks' capital cushions. Market participants, investors and counterparties have derived only limited comfort from capital reserves that are barely in line with regulatory minimum requirements. Markets have discounted the importance of hybrid capital instruments because they can be partially shielded from losses. Nor have public funds been regarded as proper substitutes for private capital for a number of reasons. First, from the perspective of competitive equality, public support of banks unlevels the playing field while blunting market discipline. Second, from the viewpoint of investors, public injections of funds may not offer the highest form of protection if, as is often the case, they take the form of preferred shares, which are senior to common equity and have enhanced rights and thus do not have the same loss-absorbing capacity. Finally, from the perspective of banks' management, public support comes with implicit or explicit restrictions on their decision-making.

… as market expectations became more demanding

A number of banks responded opportunistically in managing their capital position. Some broke with historical practice and surprised investors by not calling subordinated debt issues prior to the contractual step-up in interest payments, preferring to incur a higher cost than to access the market with a new issue. Others took advantage of depressed secondary market prices by buying back previously issued debentures: the difference between the market price and the book value of these liabilities boosted core capital buffers. In response to capital deficiencies identified by supervisory-led stress tests of balance sheets at major US banks, a number of institutions announced recapitalisation plans for the second half of 2009.

Some banks became opportunistic

Capital and liquidity ratios of major banks[1]

	Tier 1 capital/risk-weighted assets			Non-performing loans/total assets			Net loans/total deposits		
	2006	2007	2008	2006	2007	2008	2006	2007	2008
Australia (4)	7.2	6.8	7.8	0.2	0.2	0.3	89.8	83.2	80.0
Austria (3)	8.9	7.9	7.5	2.1	2.3	…	58.1	63.2	65.7
Canada (5)	10.4	9.6	9.6	0.2	0.2	0.4	56.2	57.2	60.2
France (5)	8.0	7.6	8.0	1.1	0.9	1.0	32.8	33.4	31.9
Germany (6)	8.3	7.8	8.9	0.9	0.7	0.4	29.4	28.0	25.2
Italy (5)	6.9	6.5	7.3	3.7	3.0	3.5	68.9	71.5	71.9
Japan (13)	7.6	8.1	7.9	1.0	0.9	1.0	54.8	56.0	57.9
Netherlands (4)	9.0	10.0	10.2	0.6	0.4	0.9	50.4	49.7	58.0
Spain (5)	7.6	7.9	8.3	0.5	0.6	1.7	76.7	75.9	73.1
Sweden (4)	7.2	7.2	8.0	0.4	0.3	0.5	74.2	74.9	70.3
Switzerland (6)	11.6	11.4	13.7	0.4	0.3	0.3	35.3	34.3	39.6
United Kingdom (9)	7.8	7.6	7.6	0.8	0.8	1.1	59.6	55.1	40.7
United States (9)	8.6	8.3	9.0	0.3	0.6	1.0	63.2	61.9	54.8

[1] Weighted averages by banks' relative assets. The number of banks in the 2008 sample (for total assets) is indicated in parentheses. For UniCredit Bank Austria and all Japanese banks, 2008 data refer to September observations.

Source: Bankscope. Table III.3

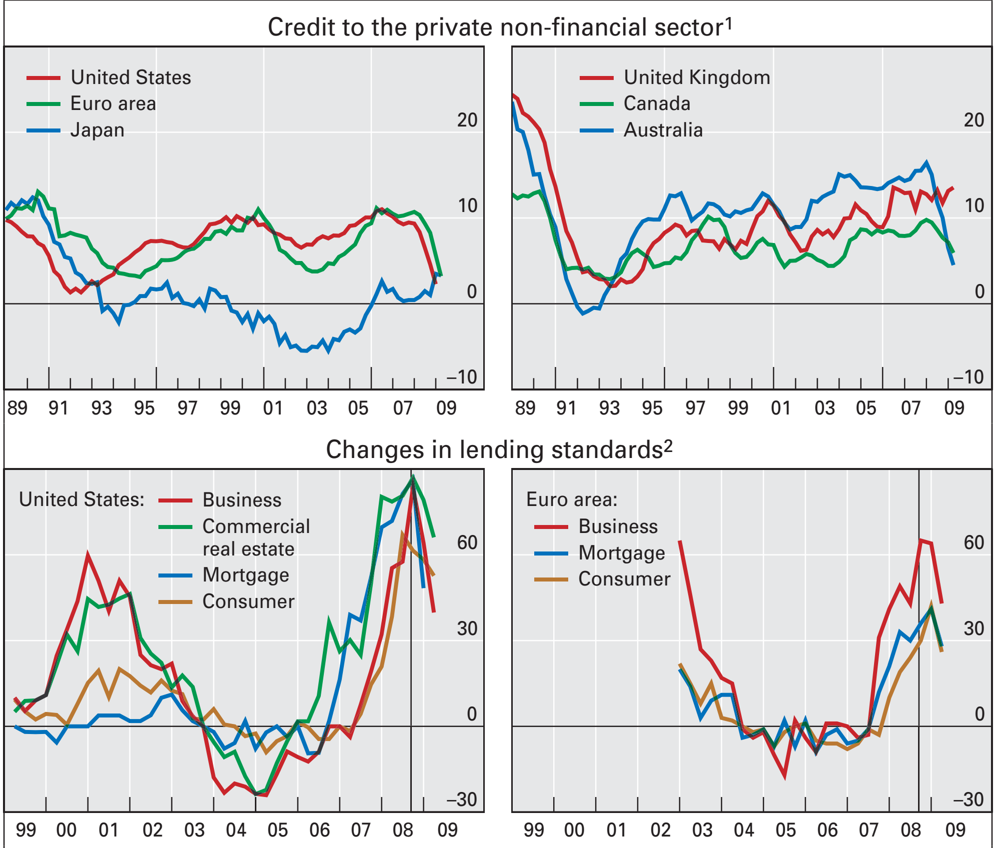
The difficulties banks have faced in maintaining capital buffers that satisfy investors, counterparties and supervisors illustrate that the interaction between the availability of capital and uncertainty about incipient risk can be intensely procyclical. Uncertainty about the path of future revenues and concern about continuing losses drove the quest for higher levels of protection at the same time that banks had to deal with a surge in writedowns. The same uncertainty also limits the supply of capital to banks in periods of systemic stress, precisely when it is most needed. Such experiences offer strong arguments in favour of providing incentives to institutions to build buffers in good times that can be used during more stressful periods (see Chapter VII).

Deleveraging

The elevated cost of funding has forced banks to trim the assets side of their balance sheets. The effective degree of leverage at banks has been coming down from the heights reached prior to 2007, even though the effect on total credit extended may not be as easily discernible in aggregate statistics.

Credit flows have been a lagging indicator of the impact of the crisis on financial intermediation. Aggregate statistics show a sharp slowdown in the

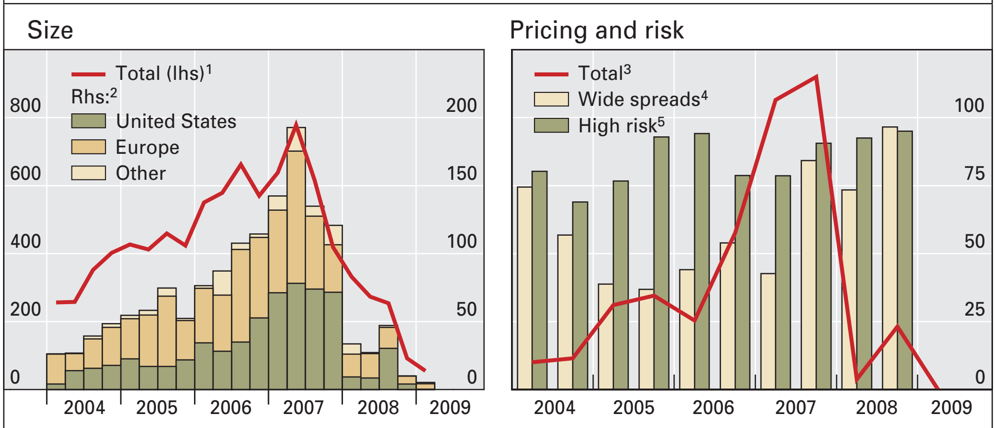
Credit growth and lending standards



[1] Year-on-year growth, in per cent. [2] Net percentage of banks reporting tightening standards in surveys by national central banks. The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection.

Sources: Datastream; national data. Graph III.4

LBO loan market: size, pricing and risk



[1] Leveraged buyout (LBO) issuance, number of loans. [2] LBO issuance, in billions of US dollars. [3] Total issuance of rated LBO loans, in billions of US dollars. [4] LBO loans with spreads over Libor of 250 basis points or more, as a percentage of total issuance of rated LBO loans. [5] LBO loans rated below BB, as a percentage of total issuance of rated LBO loans.

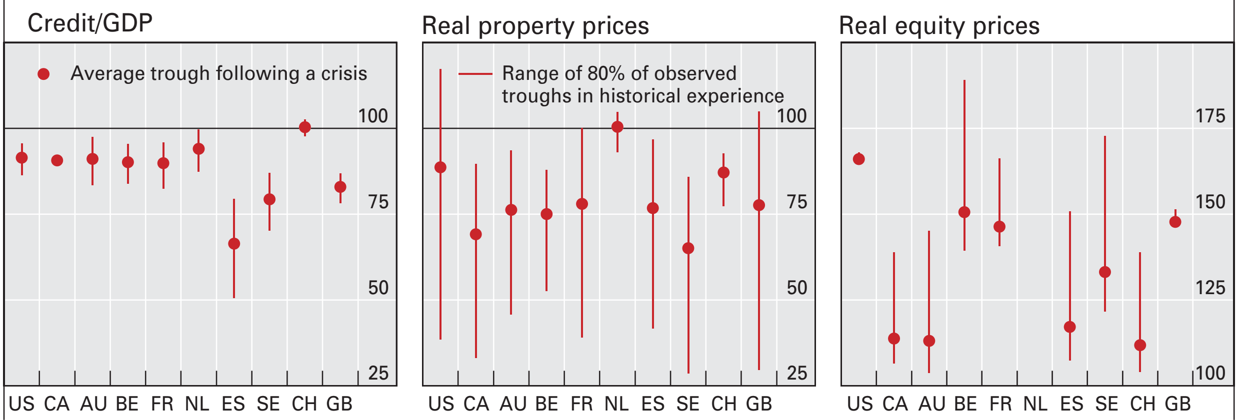
Source: Dealogic Loanware. Graph III.5

Aggregate credit has been a lagging indicator

growth of credit to the private sector starting late in the first stage of the crisis (Graph III.4, top panels). These figures, however, conceal more pronounced shifts in lenders' attitudes, and have been influenced by the effective closure of many securitisation markets. Banks tightened their lending standards throughout the first three crisis stages across all types of loans, although arguably more sharply in the case of household credit, including mortgages (Graph III.4, bottom panels). The tightening of standards affected new credit. During the early stages of the crisis, reported credit growth remained robust, but to a large degree this reflected special circumstances. The first of these was market and supervisory pressure on banks to consolidate previously off-balance sheet exposures to securitisation vehicles. This tended to swell balance sheets without, of course, reflecting any fresh extension of credit. Second, borrowers pre-emptively raised funds in anticipation of credit tightening by drawing down credit lines that had been granted before the crisis, often at very favourable terms. In the later stages of the crisis, as problems were transmitted from the financial sector to the real economy, the decline in the growth of credit aggregates arguably also reflected a slowdown in demand. Firms and households refocused towards capital preservation as well as towards managing excess capacity and high levels of debt. The continuing increase in lenders' credit costs associated with the higher incidence of defaults suggests that the process of adjustment is far from completed. Conceivably, credit growth may continue to contract through the early stages of the eventual recovery.

The impact of deleveraging can be clearly seen in declining debt issuance linked to leveraged buyouts (LBOs). In the years leading up to the crisis, the rapid increase in the activity of private equity funds was accompanied by a boom in the issuance of debt, which peaked in early 2007. In fact, the combination of debt overhang, tighter credit conditions and a downward revision in corporate earnings forecasts has brought the LBO market to a virtual halt (Graph III.5). Some private equity funds, unable to find profitable

Credit and asset prices after banking crises



AU = Australia; BE = Belgium; CA = Canada; CH = Switzerland; ES = Spain; FR = France; GB = United Kingdom; NL = Netherlands; SE = Sweden; US = United States. Current levels of the variables (= 100) compared with their troughs after banking crises, based on average historical experience.

Sources: National data; BIS calculations. Graph III.6

opportunities, have returned capital to their investors. Others have been trying to manage their debt levels by seeking concessions from creditors.

Historical comparisons can be misleading

Experience with the aftermath of previous financial crises can provide a benchmark for the potential effect of the current crisis on credit (Graph III.6). Across a number of countries, the current decline in the ratio of credit to GDP from its recent peak is about four fifths of its average post-crisis decline. Property markets, which are an important factor in the dynamics of this credit cycle, also do not appear to have fallen in line with past experience. In contrast, declines in equity markets in a number of economies appear to have overshot the average for past episodes. An important caveat, however, is the international character of the current crisis relative to others in the recent past. Problems in the financial sector have been particularly deep-seated and synchronised across the industrial world. Similarly, the slowdown in economic activity has been global in nature. This suggests that the current crisis may prove to be longer and the process of economic recovery slower than in earlier, less international episodes.

Insurance companies and pension funds

Insurance companies and pension funds have been affected by the crisis in several ways. Asset price declines and lower long-term interest rates delivered large hits to both sides of their balance sheets. For individual insurers, the foray into insuring against credit risk was a source of considerable stress.

Investment losses for insurance companies …

For the majority of insurance companies, the main effect of the crisis has been on their financial performance rather than on premium income. The crisis does not appear to have had a major immediate impact on sales of insurance products. Life insurance premiums grew, albeit at a more moderate pace than in previous years, even as non-life premiums stagnated. This trend may not continue if liquidity-constrained clients decide to raise cash by cancelling their insurance policies. The impact of the asset market slump was reflected primarily in the performance of financial asset portfolios. Companies suffered losses as prices fell across a broad array of asset classes. Individual companies also registered significant losses on holdings of instruments related to subprime mortgages. For life insurance companies, the decline in the level of long-term yields also meant an increase in liabilities on long-maturity policies. The announcement of losses in the insurance industry has lagged that in banking in part because differences in accounting practices mean that the former is slower to recognise investment portfolio results.

The firms affected most by the crisis were those involved in the provision of credit risk insurance. Monoline insurance companies, which specialise in the provision of credit guarantees, remained under strain and the intervention of prudential authorities was necessary to avert bankruptcies on a large scale. As the creditworthiness of borrowers declined, concerns about the ability of monoline insurers to honour their guarantees mounted and led to significant marked to market losses for banks that had purchased insurance (Table III.2). The near collapse of AIG, an insurance conglomerate, was directly linked to the underwriting of credit risk. Its writedowns surged along with soaring CDS spreads. The size of its liabilities and the central role its credit derivatives operation played as counterparty in the over-the-counter market repeatedly necessitated extraordinary official intervention to provide substantial financial support.

... and pension funds

The value of pension fund assets is estimated to have fallen by about 20% over the course of 2008. As the value of liabilities swelled, the coverage ratios of the funds declined sharply, and with them the funds' risk appetite. As a result, many funds increased their portfolio allocation to government bonds. Looking ahead, the retreat from riskier investments could contribute to pressure on equity markets, delaying their recovery. Similarly, the decline in the pension wealth of households participating in defined contribution plans and of employers sponsoring defined benefit plans has implications for aggregate spending (see Chapter IV).

Hedge funds

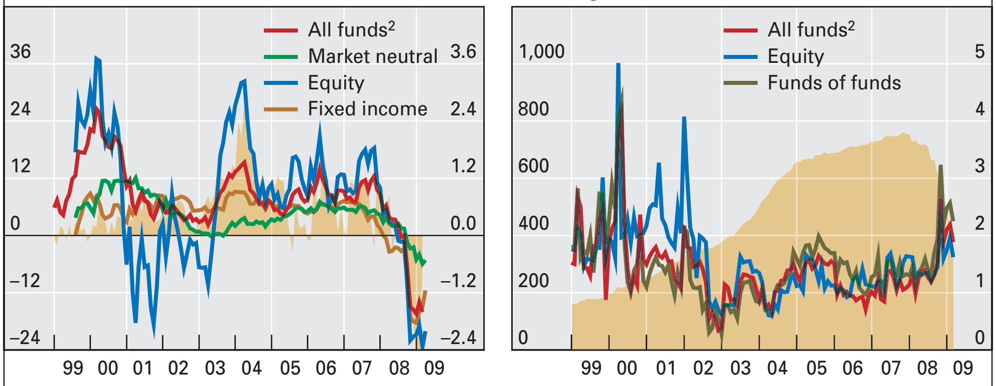
Hedge funds have not played a central role in shaping the dynamics of the crisis, but they have been greatly affected by events. Their asset performance has been hit hard, and their funding conditions have worsened dramatically. As a result, a number of funds have found themselves in serious difficulty.

Bad performance and outflow of capital

The past year was one of the worst on record for hedge fund performance. Financial results were negative across practically all investment strategies, as well as for funds of funds (Graph III.7), as returns in asset markets plummeted and the cost of funding soared. In addition, the general shortage of liquidity in the markets coupled with investors' withdrawal from risk-taking had a large impact on hedge funds. As counterparties pressed for increased transaction margins and investors withdrew funds on an unprecedented scale, the industry contracted sharply. Estimates of assets under management shrank by more than one third in the course of the second half of 2008, with bad performance and customer withdrawals playing an

Hedge funds: size, performance and leverage

Returns[1] and inflows | Leverage measures[3] and assets



The shaded areas represent hedge fund flows and stocks respectively (left-hand scales, in billions of US dollars).

[1] Average annualised excess return (12-month moving average), in per cent, across hedge funds; relative to three-month US Treasury bill yields. [2] Includes all available styles of hedge fund families weighted by assets under management. [3] Leverage estimates are based on the regression methodology described in P McGuire, E Remolona and K Tsatsaronis, "Time-varying exposures and leverage in hedge funds", *BIS Quarterly Review*, March 2005. A value of 1 suggests no leverage.

Sources: Hedge Fund Research, Inc; BIS calculations. Graph III.7

equal role in the decline. A number of funds closed. Many fund managers attempted to preserve capital by restricting withdrawals, thereby lengthening investors' effective lock-in period.

Greater institutionalisation

The crisis is likely to accelerate the trend in the industry, already in evidence for some time, towards greater institutionalisation and transparency. To avoid the fate of smaller funds that were liquidated as a result of investor withdrawals, many larger funds have oriented their marketing more towards institutional investors. Such a shift engenders demands for greater transparency about the investment strategy and greater scrutiny of risk management processes. The headline news about massive fraud by a large New York-based fund is likely to have similar effects. Although it is best not to generalise from this particular incident, due diligence by wealth managers, who channel the investments of high net worth individuals into hedge funds, will intensify as a result. Responding to the challenges of the investment environment, some of the larger funds introduced lower fee schedules and processes that pay closer attention to the needs of large institutional clients. Finally, a number of official recommendations for the reform of the prudential framework imply tighter oversight of the industry. Such reforms include the registration of all hedge funds, more demanding reporting requirements for the larger funds and direct supervision of those whose operations have implications for systemic stability.

The long-term implications of the crisis for the financial sector

The crisis has already profoundly affected the global financial system. The scale of the losses suffered has seriously damaged financial firms' balance sheets. However, the efforts by institutions to rebuild their strength will have implications not only for their short-term performance but also for the financial structure beyond the current episode. Similarly, official initiatives aimed primarily at resolving the crisis are likely to exert a lasting influence on the financial landscape.

The crisis is bound to condition the understanding of financial risk both at the level of the single firm and at the level of the financial system. In particular, this episode has highlighted the degree to which the interactions among the components of the financial system, as well as between the system and the real economy, had been misjudged. At the level of the firm, it pointed to shortcomings in the functioning of securitisation markets that, when overlooked, can reverse the diversification benefits these markets can offer. Similarly, it demonstrated the vulnerability that can arise from the use of market-based funding channels for financial institutions, especially when combined with high leverage. At the systemic level, the crisis showed that the interconnections between financial markets and institutions place a natural limit on how far systemic risk can be reduced through the existence of multiple channels of intermediation.

The shortcomings of securitisation

The crisis highlighted several shortcomings in the originate-to-distribute business model. During the early stages of the crisis, some observers labelled it as the first such episode of the securitisation era. While this characterisation arguably exaggerates the causal influence of securitisation, it does reflect the fact that exposures to securitised loans accounted for the bulk of the financial sector's early losses. Failures in information flows along the securitisation chain played a key role in shaping the dynamics of the crisis.

Potential benefits of securitisation …

The potential benefits of securitisation are easily understood. By divorcing the origination of credit from the ultimate bearing of risk and allowing greater risk dispersion, securitisation can improve the overall efficiency of financial intermediation. Actors along the securitisation chain can make best use of their comparative strengths in processing information or managing particular types of risk.

… were undermined by impaired information flows

The events surrounding the crisis revealed how these benefits can be undermined by weaknesses stemming from the interactions between individual incentives and the quality of the information flow along the securitisation chain. Originators, intermediaries, investors and third-party assessors of risk each have specific responsibilities and different perspectives. The integrity of the securitisation process depends critically on those interlocked interests reinforcing the incentive of all parties to seek and make use of information. In the event, potential reputational costs from sub-par evaluation and monitoring of risk by originators and intermediaries were outweighed by the incentive to pursue growth created by volume-linked revenue structures. Investors' self-preservation incentives appeared numbed in an environment where the presumption of liquidity marked up the portfolios of seasoned securities on the basis of the prices of newly issued transactions. The complexity of securitisation structures contributed to the breakdown in incentives by obscuring the relationship between ultimate claims and underlying risks. Few understood the full implications of complex structures for the risk-and-return characteristics of these securities and in particular the sensitivity of their valuation to underlying assumptions. Moreover, the complexity of the transactions combined with rapid growth in the market led investors to rely excessively on rating agency assessments of risk. In retrospect, the poor quality of ratings contributed to the mispricing of securitised products.

The crisis underscored the critical importance of having high-quality information available to all parties, of ensuring that the responsibilities of all parties are clear, and of strengthening discipline by ensuring that all parties retain a sufficient degree of exposure to the overall risk. A central lesson has been that dispersion of exposures may provide only illusory risk diversification to individual participants in the securitisation chain if the system as a whole is exposed to concentrations of mispriced risk.

Interdependencies between institutions and markets

An efficient financial system channels resources from savers to investors, and allocates risk to those most capable of bearing it, in the least costly way. The existence of markets that rely on arm's length transactions to perform these functions alongside financial firms that intermediate on their balance sheet has been a desirable feature of advanced financial systems. Substitutability between the two alternative channels of intermediation has been viewed as a source of system stability and robustness: the risk of systemic bottlenecks would be reduced through diversification across the two channels.

The inter-dependencies between markets and institutions …

The crisis revealed once more that this view does not emphasise sufficiently the strong interdependencies between on-balance sheet and market-based intermediation. Institutions depend on markets for revenue generation, risk management and funding, while market functioning depends on institutions to provide market-making services, securities underwriting and lines of credit. These interdependencies between markets and institutions were showcased by the difficulties that institutions faced in funding their operations in illiquid markets and the problems created in the functioning of markets when the participating institutions were under stress. Heightened concern about counterparty risk led to a seizing-up of markets and undermined the liquidity of portfolios and firms' funding strategies, causing large losses. An important message from the crisis is that the stability of both channels of financial intermediation is supported by a common capital base. Table III.4 suggests the key role of large financial firms in both the on-balance sheet and market-based intermediation channels by highlighting that the same set of institutions are involved in both functions.

… pose challenges for prudential policy

Such interdependencies present considerable challenges for prudential policy aimed at ensuring that problems with individual institutions do not generate systemic disruptions. Dealing successfully with systemic risk requires that policy instruments be designed and calibrated taking into account the links between the various components of the financial system and, more generally, that policy implementation adopt a systemic perspective (see Chapter VII).

Concentration measures across financial product lines

In per cent

Top five institutions, by activity and period	Institutions' share of activity[1]		
	International bond underwriting	International equity underwriting	Arrangements of syndicated loan facilities
Bond underwriting			
1991–1996	39.5	35.4	.
1997–2002	45.7	38.1	48.6[2]
2003–2008	40.2	30.8	40.4
Equity underwriting			
1991–1996	28.1	53.8	.
1997–2002	34.0	52.3	18.2[2]
2003–2008	29.0	44.8	24.1
Syndicated loan lead arrangement			
1998–2002	42.4	27.8	78.3[2]
2003–2008	33.6	24.8	84.8
Derivatives dealing			
1994–1996	26.1	25.9	.
1997–2002	37.8	28.4	48.1[2]
2003–2008	32.1	32.5	28.4

[1] Percentage share of the total volume of activity in each column accounted for by the top five institutions in each row. For example, in 1991–96 the top five bond underwriters accounted for 39.5% of the total volume of international bonds underwritten and for 35.4% of the total volume of international equities underwritten. [2] 1998–2002.

Sources: Dealogic; Dealogic Loanware; Swaps Monitor; BIS calculations. Table III.4

Limits to international diversification?

The trend towards globalisation of banking …

The secular trend towards greater internationalisation of banking has been an important feature of the financial system. Internationally active banks have broadened their investment portfolios and extended their presence in foreign jurisdictions. The outstanding stock of BIS reporting banks' foreign claims grew from \$11 trillion in 2000 to over \$30 trillion by mid-2007, a major expansion even when scaled by measures of economic activity. The pursuit of diversification opportunities has been an important motivation. However, the crisis has called into question the perceived degree of asset and liability diversification attained by banks with international operations. The responses of individual institutions as well as changes in the policy framework may betoken a slowing of this trend.

… came to a halt during the crisis …

On the assets side, a heightened sense of risk associated with foreign exposures may now be inducing a "home bias" in lending. In a global systemic crisis, the benefits of international diversification are reduced, as institutions see their domestic and foreign exposures deteriorate simultaneously and as host economies import the strains foreign banks face in their home markets in the form of a reduced supply of credit. Moreover, cutting down expenses may be easier in the case of foreign country operations than in the home country,

... as banks experienced severe funding pressures ...

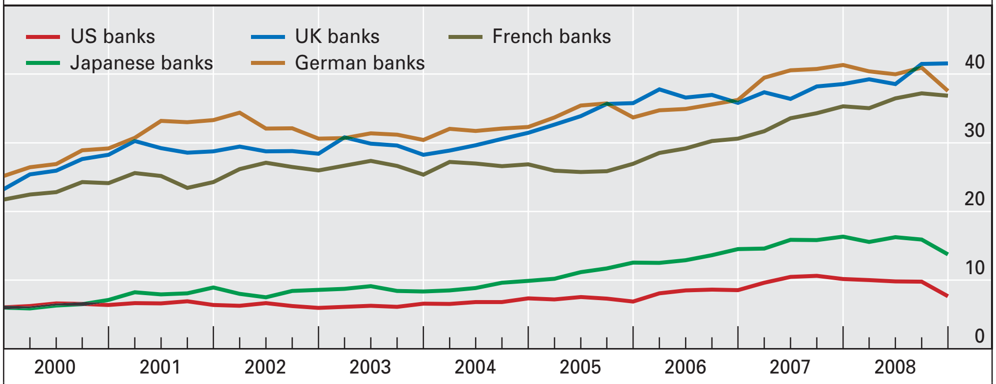
where public and political pressures are stronger. There are some signs that the process of deleveraging has affected the positions of banks at home and abroad asymmetrically: claims on non-banks residing outside the banks' home markets have shrunk significantly in recent quarters (Graph III.8). The signs of a pulling-back from international lending are more evident for US and German lenders than for others, and the effect is more pronounced when exposures to emerging market economies are considered (see Chapter V).

On the liabilities side, European banks seeking to fund their US dollar exposures were particularly affected by the shortage of funding liquidity in the past year. European lenders had built up over $5 trillion of claims on the private sector, including investments in retail and corporate loans as well as structured finance products related to US mortgages (Graph III.9, top left-hand panel). To finance those positions, they borrowed US dollars from the global interbank market, from reserve-accumulating central banks and from non-bank entities. The balance of US dollar funding was made up by borrowing in domestic currency from home country residents (shaded area in the bottom left-hand panel of Graph III.9). The currency risk associated with such cross-currency funding was probably offset to a large extent through banks' reliance on foreign exchange swaps. Banks were thus exposed to a maturity mismatch as both interbank borrowing and foreign exchange swaps tended to be shorter-term than the investments they supported. This imbalance has been vulnerable to the disruptions in the interbank and swap markets since August 2007. The problems for European banks intensified with the retreat of money market funds in the wake of the Lehman Brothers bankruptcy (see Chapter II). The resulting US dollar shortage prompted the US Federal Reserve to arrange currency swaps with other central banks, enabling them to provide US dollars to banks in their respective jurisdictions (see Chapter VI).

The policy response to the crisis may also contribute to a potential halting of the process of internationalisation. The crisis brought to the fore the limits of

Banks' foreign lending as a share of total lending[1]

In per cent

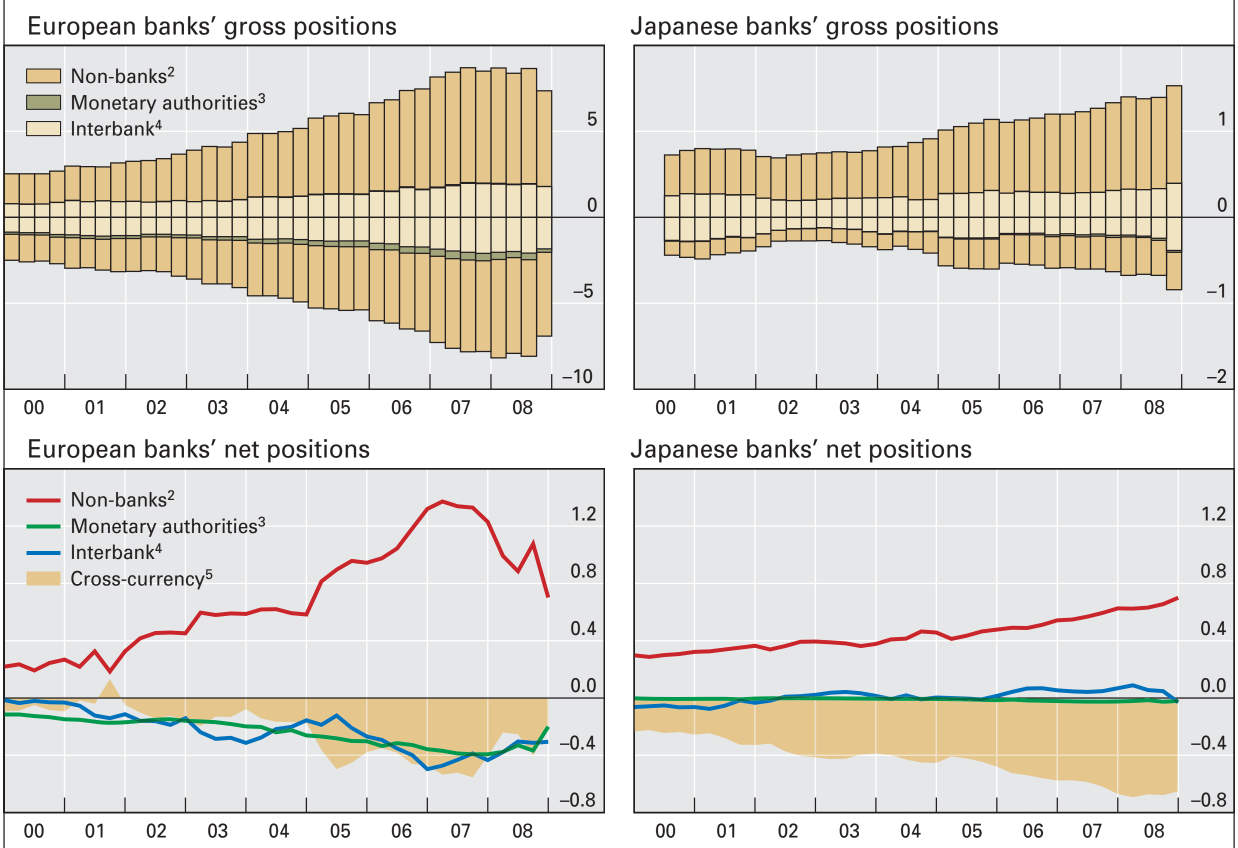


[1] Lending to non-banks residing outside a given country as a share of total lending to non-banks by banks headquartered in that country.

Sources: IMF; BIS international banking statistics. Graph III.8

The US dollar funding gap among internationally active banks[1]

In trillions of US dollars, by sector of counterparty



[1] Positive (negative) values in the top panels represent assets (liabilities) denominated in US dollars. Positions in the bottom panels are assets minus liabilities. Estimates for European banks are constructed by aggregating the on-balance sheet cross-border and local positions reported by Belgian, Dutch, French, German, Italian, Spanish, Swiss and UK banks' offices in the 40 BIS reporting countries. [2] The sum of banks' international US dollar positions in non-banks and their local US dollar positions vis-à-vis US residents booked by their offices in the United States. [3] Cross-border positions in US dollars, and local positions where the US dollar is a foreign currency, vis-à-vis official monetary authorities. [4] Interbank lending to (and borrowing from) unaffiliated banks. [5] Implied cross-currency funding, which equates gross US dollar assets and liabilities.

Sources: BIS international banking statistics; BIS calculations. Graph III.9

national authorities in dealing with troubled banks with international operations and exposed their difficulties in addressing domestic market problems caused by disruptions in the international flow of liquidity. As a result, new policy requirements aimed at strengthening the resources of local branches and subsidiaries to deal independently with such risks are likely to reduce the operational benefits of centralised risk and liquidity management by institutions with cross-border business.

… and policy responses targeted national banking systems

The size of the financial sector

An event of the magnitude and depth of the current crisis is also likely to be long drawn out. Following the stages of acute strains in September and October 2008, the financial system now has to face the structural implications of the crisis. The progress that the financial sector makes in dealing with the damage caused as well as the vulnerabilities revealed by the crisis will not only shape the recovery but will also determine its timing.

Adjustments to intermediation capacity will be necessary

Historically, a prerequisite for successful recovery from a financial crisis has been the shedding of the excess capacity that is inevitably created in the financial sector during the preceding boom. In the run-up to the current crisis, various metrics pointed to considerable growth of the financial sector in the advanced economies. They include the size of financial firms' balance sheets, their equity market capitalisation, their share of aggregate profits and their overall contribution to aggregate GDP. This increase in financial capacity was driven by expectations of continuing profitability, fuelled in the latter stages in part by an increase in leverage. The ability of financial firms to raise capital to support the same scale of activity will be limited in the near term, and a consequent deleveraging is consistent with financial firms shrinking in size in order to survive the current environment. At the same time, markets and supervisors have raised the benchmark for the capital adequacy of financial institutions. This implies that investors' expectations and financial firms' targets for rates of return will need to be adjusted to less ambitious levels. The elimination of excess capacity in the sector is thus a prerequisite for achieving sustainable levels of profitability.