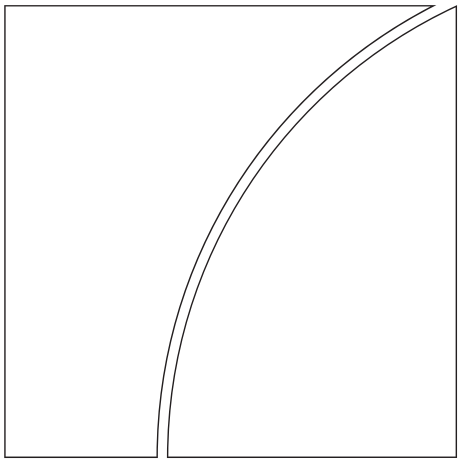
BANK FOR INTERNATIONAL SETTLEMENTS



79th Annual Report

1 April 2008–31 March 2009

Basel, 29 June 2009

Copies of publications are available from:

Bank for International Settlements
Communications
CH-4002 Basel, Switzerland

E-mail: publications@bis.org
Fax: +41 61 280 9100 and +41 61 280 8100

ISSN 1021-2477 (print)
ISSN 1682-7708 (online)
ISBN 92-9131-172-3 (print)
ISBN 92-9197-172-3 (online)

Also published in French, German, Italian and Spanish.
Available on the BIS website (www.bis.org).

Contents

The chapters of this Report went to press between 8 and 12 June 2009.

Graphs

Tables

Conventions used in this Report

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

Differences in totals are due to rounding.

79th Annual Report

submitted to the Annual General Meeting
of the Bank for International Settlements
held in Basel on 29 June 2009

Ladies and Gentlemen,

It is my pleasure to submit to you the 79th Annual Report of the Bank for International Settlements for the financial year which ended on 31 March 2009.

The net profit for the year amounted to SDR 446.1 million, compared with SDR 544.7 million for the preceding year. Details of the results for the financial year 2008/09 may be found on pages 176–80 of this Report under "Financial results and profit distribution".

The Board of Directors proposes, in application of Article 51 of the Bank's Statutes, that the present General Meeting apply the sum of SDR 144.7 million in payment of a dividend of SDR 265 per share, payable in any constituent currency of the SDR, or in Swiss francs. This year's proposed dividend per share is the same as paid out last year.

The Board further recommends that SDR 30.1 million be transferred to the general reserve fund and the remainder – amounting to SDR 271.3 million – to the free reserve fund.

If these proposals are approved, the Bank's dividend for the financial year 2008/09 will be payable to shareholders on 2 July 2009.

Basel, 12 June 2009

JAIME CARUANA
General Manager

I. Rescue, recovery, reform

How could this happen? No one thought that the financial system could collapse. Sufficient safeguards were in place. There was a safety net: central banks that would lend when needed, deposit insurance and investor protections that freed individuals from worrying about the security of their wealth, regulators and supervisors to watch over individual institutions and keep their managers and owners from taking on too much risk. And when an individual country faced a banking crisis, experts – feeling they knew better – would criticise the authorities for their mistakes. Prosperity and stability were evidence that the system worked. Inflation was low, growth was high, and both were stable. The policy framework, built on sound economic principles combined with a bit of learning, had delivered the Great Moderation in the industrial world. The emerging market world was wisely following the lead.

What a difference two years make. Since August 2007, the financial system has experienced a sequence of critical failures.

The financial system is the plumbing of the economy ...

The financial system is the economy's plumbing. And like the plumbing in a house, it is taken for granted when it works, but when it doesn't, watch out. In the same way that modern living depends on a reliable flow of water running through pipes, the modern economic system depends on a reliable flow of financing through intermediaries. On an average day, billions of individual payments are made, each requiring the transfer of funds. But daily life is even more reliant on financial intermediation than this suggests. Many people in the industrial world own the home in which they live because they saved a portion of their income each month in a financial institution, and then combined those savings with a mortgage to purchase the home. Obtaining the mortgage almost surely required obtaining fire insurance from an insurance company. The electricity, water and heating bills are probably paid each month using funds deposited automatically by the homeowner's employer into the homeowner's account at a commercial bank. Travelling to work each day means either riding on public transport financed in part by bonds and taxes or driving in an insured car on a publicly or privately financed road. And that's really just the beginning. Modern life requires the smooth operation of banks, insurance companies, securities firms, mutual funds, finance companies, pension funds and governments. These institutions channel resources from those who save to those who invest, and they are supposed to transfer risk from those who can't afford it to those who are willing and able to bear it.

... and it has been critically damaged

Over the past few years, this essential and complex system of finance has been critically damaged. Evidence of serious trouble emerged when banks became less willing to lend to each other, because they were no longer sure how to value the assets held and the promises made – both their own and

those of potential borrowers. For a time, central bank lending was able to fill the gap. But, as described in Chapter II, from August 2007 the stress in the financial system increased in waves. By March 2008, Bear Stearns had to be rescued; six months later, on 15 September, Lehman Brothers went bankrupt; and by the end of September, the global financial system itself was on the verge of collapse.

The financial system is based on trust, and in the wake of the Lehman failure that trust was lost. Ordinary people had placed their confidence in those who ran and monitored the financial system, only to discover that the system could fail anyway. The crisis shattered lenders' trust that a loan previously thought to be of high quality was likely to be repaid, and it dissolved the confidence of investors in the long-term safety of their investments. As the difficult and time-consuming task of cleaning up institutions' balance sheets went on, property rights that are normally taken for granted were being questioned; and so financial institutions – normally run, at least in part, by traders and loan officers together with the risk managers who try to control them – were placed in the hands of lawyers. Unfortunately, once lost, trust is regained only slowly. And before trust can be fully regained, the financial system will have to be rebuilt.

The modern financial system is immensely complex – possibly too complex for any one person to really understand it. Interconnections create systemic risks that are extraordinarily difficult to figure out. The fact that things apparently worked so well (up until the time that they did not) gave everyone a false sense of comfort. After all, when things are going well, why rock the boat? But this understandable complacency, born out of booms that make everyone better off, sows the seeds of collapse. Hence, as we attempt to explain and fix what has failed, it is essential to keep in mind that the new financial system must take better account of our inherently limited ability to understand complex processes and to foresee their potential for failure.

What went wrong?

The crisis was caused by a broad set of failures

A financial crisis bears striking similarities to medical illness. In both cases, finding a cure requires identifying and then treating the causes of the disease. Looking at the past few years, we can divide the causes of the current crisis into two broad categories: macroeconomic and microeconomic. The macroeconomic causes fall into two groups: problems associated with the build-up of imbalances in international claims and difficulties created by the long period of low real interest rates. The microeconomic causes fall into three areas: incentives, risk measurement and regulation.[1]

[1] While they will be treated separately here, it is important to keep in mind that the macroeconomic and microeconomic causes of the crisis are related. For example, financial innovation is connected to credit booms. In the case of the current financial crisis, one could point to information technology as an important link. Without the advances in computer processing speed seen over, say, the past two decades, financial engineers would not have been able to value the complex instruments they were fabricating. And unless you convince investors that you know how to price a new instrument, there is no way to sell it. So, technological innovation that produced low-cost, high-speed computing contributed to the credit boom.

Macroeconomic causes: imbalances and interest rates

The macroeconomic causes of the crisis were global imbalances ...

One set of macroeconomic causes of the developing crisis stemmed from the notorious *global imbalances* – the persistent and large current account deficits and surpluses resulting in capital flows from capital-poor emerging market countries to capital-rich industrial economies, especially the United States. The high level of the saving rate in the emerging market world and its low level in the United States were associated with these flows. Over the years from 1999 to mid-2007 – from the end of the Asian crisis to the beginning of the current crisis – the cumulative US current account deficit was $4.6 trillion. The US Treasury estimates that, by the end of 2007, US gross external debt was roughly $13.4 trillion, nearly four times what it had been just nine years earlier.

As this pattern of international capital flows was developing, its cause was hotly debated. One hypothesis was that it came from a *global saving glut*, which in turn was a consequence of the rise in the saving rate in emerging markets. Another proposition was that it arose from the dearth of investment opportunities worldwide. A third candidate was fast-growing emerging market countries' desire for both international diversification and low-risk liquid assets. And a fourth possibility was that emerging market economies were accumulating foreign exchange reserves to fight the appreciation of their currencies that would have naturally accompanied the current account surpluses associated with their export-led growth. Related to this last view is the possibility that emerging market countries saw these reserve stockpiles as welcome war chests to help them defend against sudden capital flow reversals of the sort that had occurred during the Asian crisis.

... combined with export-led or leverage-led growth ...

It is difficult to know what to do about the dependency that developed between the export-led growth in much of the emerging world (described in Chapter V) and the leverage-led growth in a large part of the industrial world (discussed in Chapter IV). Surely there is a need to ensure that national saving is neither too low nor too high – but what policies could achieve that? And should anything be done about the magnitude of foreign exchange reserve holdings?

It is important to keep in mind that persistent current account imbalances are not the only thing that matters. Those imbalances just measure the net flows of goods and services and the matching net flows of private capital plus changes in official reserve holdings. Apart from the net flows, the total stock of claims is important as well. The stock measures the quantity of the claims of residents in one country on the residents of another, and these claims are critical for at least two reasons. First, if the appeal of investing abroad suddenly drops, it is the stock of claims that investors will try to repatriate. Second, and even more importantly here, if one country is producing assets that are grossly mispriced and whose quality is lower than is generally perceived, they can act as a virus, carrying the disease abroad from the country of issue. That is, foreign investors overpay for the bad assets and then become as sick as domestic investors. When that happens, as it did with the securities backed by US subprime mortgages, the critical measure is the total quantity of the bad assets that are being held, not the net changes in holdings over any given period.

... and low interest rates ...

The second set of macroeconomic causes of the brewing crisis stemmed from the protracted period of low real interest rates in the first half of this

decade. The proximate cause of the low rates was the combination of policy choices in both the industrial and emerging market economies together with the capital flows from emerging market countries seeking low-risk investments. A fear of deflation in those years led policymakers to keep short-term real interest rates unusually low. The real federal funds rate in the United States was consistently below 1% from mid-2001 up to the end of 2005; indeed, for much of this period it was negative (see Chapter IV). There were two reasons why the low real rates in the United States had a much greater effect on global economies and financial conditions than the size of the United States in the world economy would suggest: international contracts are often denominated in dollars, and many fixed or quasi-fixed exchange rate regimes use the dollar as a reference currency.

Real interest rates in the other major industrial economies were not much higher than those in the United States. In response to sluggish growth in the euro area, the ECB held short-term real interest rates below 1% for most of the period between mid-2001 and 2005; in Japan, real interest rates have been hovering between 0 and 1% for most of the past decade. And – in part to contain exchange rate appreciation pressures – many emerging market economies followed suit.

... which caused a credit boom

Low real interest rates had a variety of important effects, some more predictable than others. On the more predictable side, by making borrowing cheap they led to a credit boom in a number of industrial economies. For instance, credit in the United States and the United Kingdom rose annually by 7% and 10%, respectively, between 2003 and mid-2007 (see Chapter III). It is always difficult to establish clear causal links, but in this case it seems reasonable to conclude that cheap credit formed the basis for the increase in home purchases as well as for the dramatic rise in household revolving debt. A second predictable effect of low interest rates was to increase the present discounted value of the revenue streams arising from earning assets, driving up asset prices. This was one element feeding the property and stock market booms. Real house prices in the United States, the United Kingdom and a number of European countries increased more than 30% between 2003 and the peak reached three to four years later, while global equity markets rose more than 90% from 2003 to mid-2007.

Among the less expected effects of the low interest rates were the incentives they created in the asset management business. Financial institutions regularly enter into long-term contracts committing them to produce relatively high nominal rates of return. When interest rates become unusually low, the returns promised in those contracts can become more difficult to generate. At that point, the institution responds by taking on more risk in the hope of generating the returns needed to remain profitable. Something similar is true of asset managers whose clients expect high nominal returns. Again, increasing risk (and, in this case, hiding it) is one way of meeting clients' demands. So, low interest rates increase risk-taking.[2]

[2] See R Rajan, "Monetary policy and incentives", remarks at the Bank of Spain conference *Central banks in the 21st century*, Madrid, 8 June 2006, www.imf.org/external/np/speeches/2006/060806.htm.

The boom caused distortions …

All of this – the housing boom, the boom in debt-financed consumer expenditure and the search for yield – helped distort the macroeconomic structure of a number of countries. The clearest signs of the distortions were dramatic increases in residential construction, in consumer durables consumption, especially of cars, and in the size of the financial sector.

Those distortions had important short- and medium-term effects. In the short term, they fooled investors, consumers and policymakers into thinking that trend growth was higher than it really was. And in the medium term, they created the need for substantial adjustments. Where do these misperceptions show up? Unsurprisingly, bubbles tend to be concentrated in sectors where productivity growth has, or is perceived to have, risen. In the 1990s, that sector was high technology; in this decade, it was finance. The pattern is straightforward: the boom makes capital relatively cheap for the favoured industry, creating overemployment, overinvestment and overproduction. While less of a problem in the current decade than in the previous one, the result is a temporary rise in measured average productivity gains across all sectors, which everyone, including policymakers, can easily mistake for an increase in trend growth.

… that need to be unwound

The bubble-induced distortions have medium-term implications for the economic structure that are more familiar than the short-term effects. We have seen these regularly when relative prices changed in a manner requiring significant adjustment in the composition of the capital stock. Historical examples include the impact of the sudden increase in oil prices, in 1974 and again in 1979, which left households and firms with appliances, automobiles, machinery and buildings that were more energy-intensive than could be justified by the new operating cost. This time, countries have been left with bloated financial sectors, the ability to build more cars than their populations need and, in some cases, surplus housing stocks.

Microeconomic causes: incentives, risk measurement and regulation

Microeconomic causes involved incentives, risk measurement and regulation

The financial stress that began in the summer of 2007 has revealed a myriad of limitations in microeconomic financial arrangements. These include problems with incentives; flaws in techniques used to measure, price and manage risk and in the corporate governance structures used to monitor it; and failings of the regulatory system. Jointly, these weaknesses allowed the entire financial industry to book profits too early, too easily and without proper risk adjustment.

Distorted incentives involved monitoring …

The crisis has revealed distorted incentives for consumers, for financial sector employees and for rating agencies. First, consumers failed to watch out for themselves. Few people have any knowledge of the balance sheets of the banks where they do business or of the finances of the firms in which they invest through the purchase of equity or debt securities. And the overall level of financial literacy among the general population is low.[3] This lack of

[3] Indeed, it would seem that the majority of people do not understand the mechanics of interest rates. In response to a question about how many years it would take for a debt to double if the interest rate is 20% per year compounded annually and nothing is repaid, only 36% of 1,000 respondents chose the correct option ("Less than 5 years"), and nearly 20% answered "Do not know". See A Lusardi and P Tufano, "Debt literacy, financial experiences, and overindebtedness", *NBER Working Papers*, no 14808, March 2009.

knowledge combined with the existence of financial oversight structures made people all too willing to mistake the complexity of the system for sophistication. And it made them all too willing to assume that their investments were safe. After all, someone else was watching – be it a trusted manager, an equity analyst, a credit rating agency or a government official. But none of them were. The system that consumers so readily assumed was sophisticated and safe was, in fact, recklessly complex and opaque.

As if that wasn't enough, managers of financial firms saw a need to drive up returns on their equity to satisfy shareholders. That led to an explosion in debt financing. The reason is straightforward: the return on equity equals the return on assets times the ratio of assets to equity – that is, higher leverage yields higher returns to the owners. This private incentive to increase leverage created not only fragile institutions but also an unstable financial system.

... compensation ...

Compensation schemes further encouraged managers to forsake long-run prospects for short-run return. In some cases, profits calculated with complex mathematical models were used to determine rewards even when markets for the assets underlying the calculations did not exist and so they could not be sold. Equity holders (because of limited liability) and asset managers (because of their compensation system) were unduly rewarded for risk-taking: they received a portion of the upside, but the downside belonged to the creditors (or the government!). Moreover, managers of assets in a given asset class were rewarded for performance exceeding benchmarks representing average performance in that investment category. As a result, even if managers recognised a bubble in the price of some asset, they could not take advantage of that knowledge by selling short for fear that investors would withdraw funds. The result was herding that caused arbitrage to fail.[4] In the end, the overall difficulty in distinguishing luck from skill in the performance of asset managers, combined with compensation based at least in part on the volume of business, encouraged managers and traders to accumulate huge amounts of risk.

... and rating agencies

Added to failures in monitoring by individuals and flawed compensation schemes were the skewed incentives of the rating agencies. These organisations are designed to mitigate the information problems that plague debt financing by providing a third-party evaluation of the likelihood that a borrower will repay a loan or bond. There are a number of problems with this system. Ratings are expensive, difficult to produce and impossible to keep secret. Once information becomes public, its reproduction is costless. Knowing that, the rating agencies charge those who need the ratings most – the bond issuers. Although neither new nor unique – rating agencies have charged bond issuers for decades, and auditors are paid by those they audit – this arrangement helped distort incentives. Moreover, the complexity of the financial instruments and the pace of issue – the flood of asset-backed securities and structured finance products issued over the past decade – made the rating

[4] For a discussion of how arbitrage fails when individual investors cannot distinguish good asset managers from bad ones, see J Stein, "Why are most funds open-end? Competition and the limits of arbitrage", *Quarterly Journal of Economics*, vol 120, no 1, February 2005, pp 247–72.

business both more difficult and more profitable. And because of the complexity of the instruments, reliance on ratings increased even among the most sophisticated institutional investors.[5] In the end, the rating agencies – assigned the task of assessing the risk of fixed income securities and thus of guarding collective safety – became overwhelmed and, by issuing unrealistically high ratings, inadvertently contributed to the build-up of systemic risk.[6]

Challenges to risk measurement included:

Next on the list of microeconomic causes of the crisis is risk measurement. Measuring, pricing and managing risk all require modern statistical tools based largely on historical experience. Even when long data histories are available, the belief that the world evolves slowly but permanently means down-weighting the importance of the distant past. The implication is that a long period of relative stability will lead to the perception that risk is permanently lower, driving down its price.

the infrequency of infrequent events;

Addressing this misperception is an enormous challenge. The major risks – those that require substantial compensation – are large, infrequent events. In the parlance of statisticians, we need an accurate assessment of the size of the tails of the distribution of outcomes. But such an assessment can only come from historical experience, and infrequent events are, well, infrequent. Thus, the statistical models needed for measuring, pricing and managing risk will, almost by definition, be inaccurate because of a lack of data. Given its simplicity, the natural assumption is that returns of many different assets are normally distributed (and so have *thin* tails). And, although tail events are infrequent, in reality they are more frequent than is predicted by a normal distribution. Even though the problem with assuming a normal distribution was well known, the assumption persisted with the unsurprising result that insurance against infrequent catastrophes was underpriced.

new instruments;

The difficulty of assessing the tails of the distribution of outcomes is even greater for new financial instruments. With no history, their riskiness cannot be statistically measured at all. This lack of experience was one of the problems associated with securitising subprime mortgages in the United States. The innovation of pooling together large numbers of what were objectively low-quality loans, and then creating a mix of high-quality and low-quality securities backed by the pool, allowed debt market access to an entirely new class of borrowers.[7] The major flaw, however, was that originators generally retained little of the default risk, and so as the boom developed, the quality of the loans progressively worsened. But even if originators had been forced to retain a

[5] For an analysis of the challenges involved in rating asset-backed securities and a discussion of the limitations of ratings as measures of risk, see Committee on the Global Financial System, "The role of ratings in structured finance: issues and implications", *CGFS Publications*, no 23, January 2005.

[6] Differences in the methodologies used by the rating agencies also provided incentives for the originators to structure their asset-backed securities in ways that would allow them to "shop" for the best available combination of ratings (across both rating agencies and the liabilities structure of those instruments). See I Fender and J Kiff, "CDO rating methodology: some thoughts on model risk and its implications", *BIS Working Papers*, no 163, November 2004.

[7] For a detailed description of how this worked, see A Ashcraft and T Schuermann, "Understanding the securitization of subprime mortgage credit", *Federal Reserve Bank of New York Staff Reports*, no 318, March 2008.

significant first loss, securitised pools of subprime mortgages might still have run into trouble because of a lack of default experience.

reliance on historical performance;

Reliance on historical performance to measure, price and manage risk has another pitfall – it can offer misleading conclusions about the correlation among various risks. Risk is reduced through (1) hedging, whereby two risks are thought to offset each other because their payoffs are negatively correlated; and (2) diversification, whereby risk is spread among assets whose returns are less than perfectly correlated. The problem is that historical correlations may be poor guides to future price movements. For example, before the crisis, investing globally was thought to reduce risk, as prices in various regions of the world would not move together. This assumption turned out to be false when everyone most needed it to be true. When asset prices that previously moved independently (providing diversification) or in opposite directions (providing a hedge) start to move together, what used to reduce risk increases it. When the bad times came, correlations became large and positive. What was risk reduction became risk concentration.

and governance

Finally, there were governance problems in risk management practices. For both structural and behavioural reasons, senior managers and board members were neither asking the right questions nor listening to the right people. The structural problem was that risk officers did not have sufficient day-to-day contact with top decision-makers, often because they did not have sufficiently senior positions in their organisations. Without support from top management, it didn't matter much what the chief risk officer said or to whom he or she said it. The structural problem was compounded by the behavioural response to a risk officer whose job it is to tell people to limit or stop what they are doing. If what they are doing is profitable, it is going to be difficult to get managers and directors to listen.

Risk management in financial institutions has of course improved over time in addressing the incentive-related problems that arose during previous booms. But while there had been progress, it was based on a world with less leverage and risk-taking than we saw in the latest boom.

Weaknesses in regulation also contributed to the crisis

Beyond the problems with incentives and risk measurement was the fact that financial institutions found it relatively easy to move activities outside the regulatory perimeter. Inside the supervisors' sphere of influence, banks are required to hold capital in order to engage in risky activities. While it may be hard to believe, the regulatory capital requirement did limit the build-up of leverage on bank balance sheets. However, lower leverage meant lower profitability, so bank managers found ways to increase risk without increasing the capital they were required to hold. That is the story of the structured investment vehicle. More generally, the crisis showed that the enlarged financial sector – comprising both traditional banks and an increasingly important parallel financial system composed of non-bank intermediaries and off-balance sheet entities – had become much riskier than in the past.[8]

[8] See R Rajan, "Has financial development made the world riskier?", in *The Greenspan era: lessons for the future*, symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 2005, pp 313–69.

Warnings

There were danger signs. Pervasive current account deficits were unsustainable. And households could not borrow forever – they would need to repay their loans eventually. In many regions, house prices were rising more quickly than they ever had, and price levels far exceeded both replacement costs and values justified by rental incomes. Rather than seeing their houses as merely a place to live and a hedge against future increases in the price of housing – a view that could have dampened the boom – many home buyers thought that they would profit from rising prices, feeding the boom.

There were warnings ...

There were warnings. Observers noted that risk was underpriced and that, constrained by low policy rates, asset managers were too aggressive in their search for yield. Some worried that monetary policy was inattentive to the dangers that arise when an asset price boom is coupled with a credit boom.[9] They warned that a single-minded focus on price stability (combined with prudential regulators' narrow focus on individual institutions) left officials insufficiently aware of systemic threats arising from credit and asset price booms.[10] Commentators cautioned about the deterioration of credit standards, especially in the issuance of mortgages.[11] And they warned about the risks that come with rapid financial innovation.[12]

... but little agreement on detail ...

Many of these warnings turned out to be accurate, but obviously they were issued in vain.[13] While people agreed on the general nature of the stresses that were building in the system, there was little agreement on the details. The implications of the porous regulatory perimeter – through which firms could easily move activity beyond the view of officials – and the build-up of financial leverage – in which the capital structure shifted to one with relatively more debt and relatively less equity – were simply not well understood. Although some people called for effective regulation of hedge funds, they were much less vocal about the need to keep intermediaries from shifting loans to conduits and structured investment vehicles that had virtually no capital. Finally, almost no one realised that the US assets being spread around the world would turn out to be toxic.

... or required policy responses

It is not surprising that government officials and market participants were largely deaf to the alarms. A common response was: "Even if you are right, and the financial system is in danger, what do you want me to do?" Monetary

[9] See A Crockett, "In search of anchors for financial and monetary stability", speech delivered at the SUERF Colloquium, Vienna, April 2000.

[10] See, for example, C Borio and W White, "Whither monetary and financial stability? The implications of evolving policy regimes", in *Monetary policy and uncertainty: adapting to a changing economy*, symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 2003; and BIS, *73rd Annual Report*, June 2003, Chapter VIII.

[11] See Committee on the Global Financial System, "Housing finance in the global financial market", *CGFS Publications*, no 26, January 2006, www.bis.org/publ/cgfs26.htm; and BIS, *74th Annual Report*, June 2004, Chapter I.

[12] More than 20 years ago, the Cross Report noted that new financial instruments appeared to be underpriced due to a lack of history and a lack of understanding of systemic risk; see Eurocurrency Standing Committee, *Recent innovations in international banking (Cross Report)*, April 1986, www.bis.org/publ/ecsc01.htm.

[13] See, for example, BIS, *75th Annual Report*, June 2005, Chapters I and VIII.

policymakers' only available instrument was the short-term interest rate, and there was a broad consensus that this tool would be ineffective against the alleged threat. At the macroeconomic level, the expectation was that price stability would be enough and that asset and credit booms would self-correct. And at the microeconomic level, officials believed that investors' self-interest would lead them to pay attention to the risks inherent in what they purchased and act as their own regulators. The narrow focus on regulated institutions, combined with a belief in the efficacy of self-regulation, meant that officials were insufficiently alert to system-wide threats. And across countries, markedly differing views about what could and should be done sharply limited progress on what turned out to be an international problem.

Discussions of the need for someone to monitor and address the risk in the financial system as a whole mostly fell flat. Numerous central banks took their financial stability objectives seriously, issuing periodic reports on the subject. Some, especially in Asia, fashioned tools aimed at moderating booms in asset prices and credit. Examples were Thailand's implementation of limits on credit card issuance, Hong Kong SAR's control over mortgage loan-to-value ratios, and India's tightening of capital requirements and provisions. Authorities in many central and eastern European countries, as well as in Spain and some Latin American countries, strengthened their monitoring and enforcement of provisioning and loan evaluation and required banks to increase regulatory capital consistent with the underlying risks. Active use of reserve requirements to tighten or loosen liquidity denominated in both domestic and foreign currencies was also a feature in some emerging market economies. But overall, action of this sort was the exception, not the rule. In the industrial economies – especially the United States, where the problem was becoming the most severe – there was little discussion of what types of tools policymakers might try to use to combat the property and credit booms, and the consequent build-up of systemic risk. And it is easy to see why. Making what would have been wholesale changes to the monetary and regulatory policy frameworks in many countries would have presented nearly insurmountable political and intellectual difficulties. Why would anyone risk such a move when the existing apparatus appeared to be working so well?

The crisis evolves

The crisis has evolved in five stages, discussed in Chapter II

The next five chapters of this Report provide a detailed description of what has happened so far in the crisis in financial markets and institutions and in the real economy, as well as how policymakers have responded. The story is divided into five stages, described in detail in Chapter II: (1) the prelude, leading up to the March 2008 takeover of Bear Stearns; (2) the gradual deterioration in financial conditions from mid-March to the failure of Lehman Brothers on 15 September 2008; (3) from mid-September to late October, a global loss of confidence, a massive flight to quality and the near collapse of the financial system; (4) from late October, the severe decline in the global economy; and (5) beginning in mid-March 2009, the deepening downturn and the first signs of stabilisation. Table I.1 presents a summary.

The financial system was more interconnected and risky than assumed (Chapter III)

Our analysis of the crisis leads to a variety of conclusions and highlights a number of risks for the financial system. In a modern financial system, bank-based finance and market-based finance should be viewed as complementary rather than as rivals or substitutes. The crisis revealed that the presumed benefits of diversification derived from the creation of financial conglomerates – the hypermarkets of the financial system – were an illusion. When the crisis hit, all business lines were affected. Similarly, the benefits of slicing risk into its smallest components through financial engineering were oversold. However, reducing the size of the bloated financial industry should not be confused with a recommendation of financial autarky. The retreat of finance back inside national borders must be resisted. If left unchecked, the process would result in protectionism.

The crisis has impacted on the real economy globally (Chapter IV)

For industrial economies, a powerful interaction between the financial sector and the real economy began to take hold in the last quarter of 2008. A dramatic loss of confidence was combined with the unwinding of imbalances that had built up on household, industrial and financial system balance sheets in the industrial economies since the beginning of the decade. The outcome has been a severe downturn in both real activity and inflation. But since leverage has only begun to adjust – credit in both the financial and non-financial sectors of the economies that have had credit booms remains well above the level of only a few years ago – it is reasonable to anticipate both a protracted downturn and a slow recovery.

Emerging market economies experienced sharp trade and capital flow reversals (Chapter V)

For the emerging market economies, circumstances are quite different, as they initially exhibited a great deal of resilience to the financial crisis. The high degree of economic and financial integration that supported an extended period of rapid growth also left them exposed to sharp reversals in capital flows and declines in demand for their exports. Countries that maintained prudent policies and low public debt, such as those in Asia and parts of Latin America, still have flexibility to respond. However, some countries with large current account deficits, and some where banks were making foreign currency loans, have run into external financing difficulties requiring external official assistance.

Responses are unprecedented in their scale and scope (Chapter VI) ...

Policymakers have implemented a wide array of responses aimed at restoring confidence in large banks and repairing the financial system. Interest rates in most industrial economies were cut until they were at or near the zero lower bound. A number of central banks expanded their balance sheets massively to ease the acute tensions in financial markets. But even though governments have taken on large commitments, they continue to be unwilling or unable to fully address the impaired assets on bank balance sheets.

Traditional and unconventional central bank actions have been matched in many places by equally aggressive fiscal expansion. Clearly, different countries have different needs and capacities for increases in government spending. In any case, an assessment of the various spending programmes will have to wait until they take full effect.

... but policymakers must aid, not hinder adjustment (Chapter VII) ...

Policymakers face enormous challenges. They must complete the urgent task of financial repair while they keep the financial system operating in the short term. At the same time, they must design exit strategies from the various

policy measures that have been implemented. And, all the while, officials must work to build a resilient framework for the long term, crafting a system capable of quickly returning to its normal state of operation in the event of a failure.

A healthy financial system is a precondition for a sustained recovery. Delaying financial repair risks hampering the efforts on other policy fronts. To speed economic recovery, authorities must act quickly and decisively in their efforts to repair the financial system, and must persevere until the job is done.

... and policies must be sustainable in the long run

Officials will face a number of difficulties in exiting from the various crisis-related policy interventions. When real activity returns to normal, inflated central bank balance sheets will have to be slimmed down and policy interest rates raised in a timely way. Public sector borrowing will have to be pulled back to a sustainable path. And the intermediation now being conducted by central banks will have to be returned to the private sector at the same time that the financial sector shrinks.

The redesign of the financial system must be comprehensive

Ensuring financial stability requires a redesign of macroeconomic as well as regulatory and supervisory policies with an eye to mitigating systemic risks. For macroeconomic policies, this means leaning against credit and asset price booms; for regulatory and supervisory policies, it means adopting a macroprudential perspective. Importantly, reform must focus on identifying systemic risks arising in all parts of the financial system – risks that arise from the complexity, opacity and ownership concentration of financial instruments; from the counterparty risk and margining practices in financial markets; from the risk of joint failure created by interconnections and common exposures; and from the procyclicality that is inherent in financial institution management and can be compounded by microprudential regulation.

Stages of the crisis	Markets and institutions	Industrial economies		Emerging market economies	
		Macroeconomic conditions	Policy responses	Macroeconomic conditions	Policy responses
1. Pre-March 2008: **prelude to the crisis**	Subprime mortgage defaults create widespread financial stress. Uncertainty about size and distribution of losses. Crisis starts when interbank markets are disrupted in August 2007; waves of increasing intensity until March 2008.	Growth weakens.	Central bank (CB) rate cuts. Liquidity operations targeted at money markets.	Robust growth with inflation rising. Many inflation targeters above their targets.	Rate increases in response to high inflation.
2. Mid-March to mid-September 2008: **towards the Lehman bankruptcy**	Takeover of Bear Stearns in March slows decline, but bank losses and writedowns accumulate as downturn weighs on asset prices. More countries affected. Liquidity crisis reveals underlying solvency crisis, increasing pressure on financial institutions.	G3 economies contract even as oil prices fall steeply after August.	Initially further rate cuts. Liquidity facilities grow. GSEs put into conservatorship in early September.	GDP growth slows after June but remains positive. Exports weaken in central Europe.	Further rate increases due to high inflation.
3. 15 September 2008 to late October 2008: **global loss of confidence**	Demise of Lehman Brothers on 15 September 2008 triggers a bigger run on key funding markets. More financial institutions fail or are rescued. Loss of confidence affects markets and countries globally. Reprieve only after unprecedented and broad-based policy intervention.	As confidence falls and financing conditions tighten, forecasts are revised down sharply.	Sharp rate cuts, CB swap lines expanded, rapid CB balance sheet growth. Large-scale bank rescues, deposit and debt guarantees.	Confidence slumps. Financing conditions tighten. Steep currency depreciations.	Rate cuts, more flexible provisions of central bank liquidity. Deposit and debt guarantees. Capital injections.
4. Late October 2008 to mid-March 2009: **global downturn**	Markets remain volatile, with increasingly dire economic data releases, weak earnings reports and uncertainties over ongoing government intervention. Downturn means that credit losses keep mounting.	Spending drops, leading to declines in goods trade and GDP. Inflation falls, with the price level declining in some countries.	Rates cut to near zero, liquidity provision to non-banks. Outright purchases of public debt. Big fiscal stimulus packages.	GDP growth declines sharply in Q4 2008 as exports slump. Capital inflows reverse.	Further rate cuts, lower reserve requirements. FX intervention, CB swap lines. Large fiscal stimulus packages in some EMEs.
5. Since mid-March 2009: **downturn deepens but loses speed**	Asset prices recover somewhat after more policy action. But signs of market dysfunction remain, as official efforts have failed to fully restore confidence in the global financial system. Continued credit losses.	Consumption and production continue to decline, with possible signs of bottoming-out.	Further rate cuts in some countries. Accounting rules for banks eased.	Equity markets recover, and exchange rates stabilise.	Increased external official financing to support EMEs.

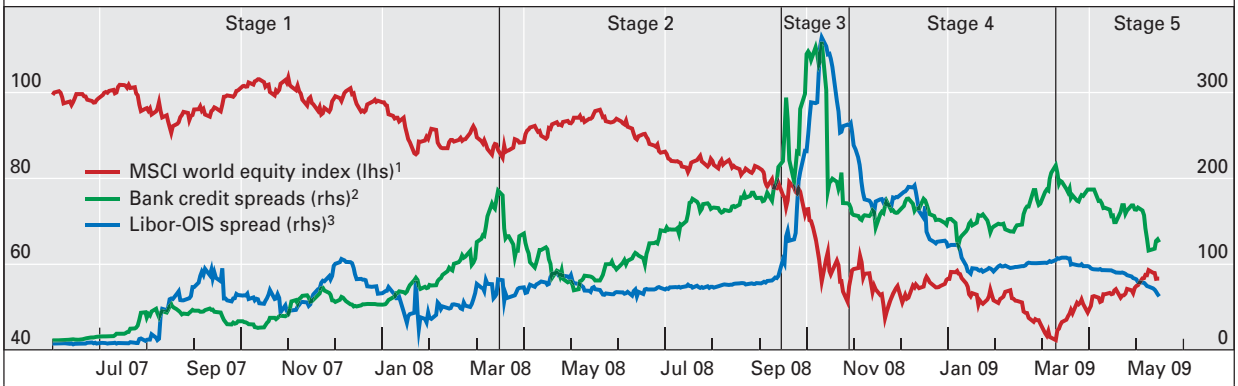
Table I.1

II. The global financial crisis

The period since last year's Annual Report saw the financial crisis enter its second year and transform into a generalised loss of confidence in the global financial system. The onset of the crisis in 2007 followed an extended period of unusually low real interest rates, easy credit conditions, low volatility in financial markets and widespread increases in asset prices that had generated large-scale but hidden vulnerabilities. When these vulnerabilities crystallised in the wake of repeated series of asset writedowns, key financial markets became dysfunctional and the solvency of large parts of the global banking system was challenged. In response, governments conducted successive rounds of intervention on an unprecedented scale. Yet, despite the success of these policy measures in halting the financial crisis, the market environment remained fragile, suggesting that the process of normalisation was uncertain and likely to be protracted.

So far, the crisis has developed in five more or less distinct stages of varying intensity, starting with the subprime mortgage-related turmoil between June 2007 and mid-March 2008 (Graph II.1). Following this first stage, during which the primary focus was on funding liquidity, bank losses and writedowns continued to accumulate as the cyclical deterioration slowly translated into renewed asset price weakness. As a result, in the second stage of the crisis, from March to mid-September 2008, funding problems morphed into concerns about solvency, giving rise to the risk of outright bank failures. One such failure, the demise of Lehman Brothers on 15 September, triggered the third and most intense stage of the crisis: a global loss of confidence, arrested only after unprecedented and broad-based policy intervention. Stage four, from

The five stages of the crisis to date



[1] Morgan Stanley Capital International index, in US dollar terms; 1 June 2007 = 100. [2] Equally weighted average of CDS spreads (in basis points) for 18 major international banks; includes Lehman Brothers until 15 September 2008 and Merrill Lynch until 31 December 2008. [3] Three-month US dollar Libor minus overnight index swap (OIS) rates, in basis points.

Sources: Bloomberg; Markit; BIS calculations. Graph II.1

late October 2008 to mid-March 2009, saw markets adjust to an increasingly gloomy global growth outlook amid uncertainties over the effects of ongoing government intervention in markets and the economy. Stage five, beginning in mid-March 2009, has been marked by signs that markets are starting to show some optimism in the face of still largely negative macroeconomic and financial news, even as true normalisation – the end of the crisis – still appears some way off.

The early stages

Stage one: prelude (up to mid-March 2008)

Subprime losses escalated into widespread financial stress ...

During the first stage of the crisis, concerns over losses on US subprime mortgage loans escalated into widespread financial stress. In brief, what initially appeared to be a problem affecting only a small part of the US financial system (Graph II.2) quickly spread more widely, as complex linkages among credit (Graph II.3) and funding markets (Graph II.4) increasingly translated into broad-based financial sector pressures (Table II.1).[1]

Starting in June 2007, losses from subprime mortgages exposed large-scale vulnerabilities. These included the widespread use of leverage and off-balance sheet financing, so that supposedly low-risk assets – many of which related to US mortgage market exposures – were effectively financed on a rolling basis by short-term funds. Accumulating losses on the underlying assets eventually disrupted the short-term funding model on which these positions were based, triggering a process of forced reintermediation. On 9 August 2007, the turmoil spread to interbank markets, signalling the advent of a broader financial market crisis. Valuation losses mounted during the following months, putting pressure on bank balance sheets and eventually triggering a severe liquidity shortage at Bear Stearns in mid-March 2008. These events culminated in the government-facilitated takeover of the troubled investment bank by JPMorgan Chase.

... culminating in the takeover of Bear Stearns ...

... and leaving the financial system badly weakened

While an outright bank failure was avoided, this first stage of the crisis left the financial system severely weakened. Large overhangs of credit exposures weighed on markets, while banks struggled to replenish their capital positions. Elevated volatilities were consistent with investor uncertainty about the economic outlook and its implications for asset valuations (Graph II.5). Credit default swap (CDS) spreads, in turn, were well above historical levels (Graph II.6, centre panel) and equity prices had fallen substantially from the peaks reached in October 2007 (Graph II.7, left-hand panel). At the same time, bond yields (Graph II.8) and policy rates (Graph II.9) in the major economies continued to reflect different cyclical positions as well as expectations that the economic fallout from the crisis would primarily affect the United States. Robust domestic growth in many emerging market economies in the first half of 2008 initially lent some support to this view.

[1] See Chapter VI of the BIS's *78th Annual Report*, June 2008, for a detailed account of financial market developments during this early part of the financial crisis.

Timeline of key events[1]

2007	
9 August	Problems in mortgage and credit markets spill over into interbank money markets when issuers of asset-backed commercial paper encounter problems rolling over outstanding volumes, and large investment funds freeze redemptions, citing an inability to value their holdings.
12 December	Central banks from five major currency areas announce coordinated measures designed to address pressures in short-term funding markets, including the establishment of US dollar swap lines.
2008	
16 March	JPMorgan Chase agrees to purchase Bear Stearns in a transaction facilitated by the US authorities.
4 June	Moody's and Standard & Poor's take negative rating actions on monoline insurers MBIA and Ambac, reigniting fears about valuation losses on securities insured by these companies.
13 July	The US authorities announce plans for backstop measures supporting two US mortgage finance agencies (Fannie Mae and Freddie Mac), including purchases of agency stock.
15 July	The US Securities and Exchange Commission (SEC) issues an order restricting "naked short selling".
7 September	Fannie Mae and Freddie Mac are taken into government conservatorship.
15 September	Lehman Brothers Holdings Inc files for Chapter 11 bankruptcy protection.
16 September	Reserve Primary, a large US money market fund, "breaks the buck", triggering large volumes of fund redemptions; the US government steps in to support insurance company AIG (and is forced to repeatedly increase and restructure that rescue package over the following months).
18 September	Coordinated central bank measures address the squeeze in US dollar funding with $160 billion in new or expanded swap lines; the UK authorities prohibit short selling of financial shares.
19 September	The US Treasury announces a temporary guarantee of money market funds; the SEC announces a ban on short sales in financial shares; early details emerge of a $700 billion US Treasury proposal to remove troubled assets from bank balance sheets (the Troubled Asset Relief Program, TARP).
25 September	The authorities take control of Washington Mutual, the largest US thrift institution, with some $300 billion in assets.
29 September	UK mortgage lender Bradford & Bingley is nationalised; banking and insurance company Fortis receives a capital injection from three European governments; German commercial property lender Hypo Real Estate secures a government-facilitated credit line; troubled US bank Wachovia is taken over; the proposed TARP is rejected by the US House of Representatives.
30 September	Financial group Dexia receives a government capital injection; the Irish government announces a guarantee safeguarding all deposits, covered bonds and senior and subordinated debt of six Irish banks; other governments take similar initiatives over the following weeks.
3 October	The US Congress approves the revised TARP plan.
8 October	Major central banks undertake a coordinated round of policy rate cuts; the UK authorities announce a comprehensive support package, including capital injections for UK-incorporated banks.
13 October	Major central banks jointly announce the provision of unlimited amounts of US dollar funds to ease tensions in money markets; euro area governments pledge system-wide bank recapitalisations; reports say that the US Treasury plans to invest $125 billion to buy stakes in nine major banks.
28 October	Hungary secures a $25 billion support package from the IMF and other multilateral institutions aimed at stemming growing capital outflows and easing related currency pressures.
29 October	To counter the protracted global squeeze in US dollar funding, the US Federal Reserve agrees swap lines with the monetary authorities in Brazil, Korea, Mexico and Singapore.
15 November	The G20 countries pledge joint efforts to enhance cooperation, restore global growth and reform the world's financial systems.
25 November	The US Federal Reserve creates a $200 billion facility to extend loans against securitisations backed by consumer and small business loans; in addition, it allots up to $500 billion for purchases of bonds and mortgage-backed securities issued by US housing agencies.

2009	
16 January	The Irish authorities seize control of Anglo Irish Bank; replicating an approach taken in the case of Citigroup in November, the US authorities agree to support Bank of America through a preferred equity stake and guarantees for a pool of troubled assets.
19 January	As part of a broad-based financial rescue package, the UK authorities increase their existing stake in Royal Bank of Scotland. Similar measures by other national authorities follow over the next few days.
10 February	The US authorities present plans for new comprehensive measures in support of the financial sector, including a Public-Private Investment Program (PPIP) of up to $1 trillion to purchase troubled assets.
10 February	G7 Finance Ministers and central bank Governors reaffirm their commitment to use the full range of policy tools to support growth and employment and strengthen the financial sector.
5 March	The Bank of England launches a programme, worth about $100 billion, aimed at outright purchases of private sector assets and government bonds over a three-month period.
18 March	The US Federal Reserve announces plans for purchases of up to $300 billion of longer-term Treasury securities over a period of six months and increases the maximum amounts for planned purchases of US agency-related securities.
23 March	The US Treasury provides details on the PPIP proposed in February.
2 April	The communiqué issued at the G20 summit pledges joint efforts by governments to restore confidence and growth, including measures to strengthen the financial system.
6 April	The US Federal Open Market Committee authorises new temporary reciprocal foreign currency liquidity swap lines with the Bank of England, ECB, Bank of Japan and Swiss National Bank.
24 April	The US Federal Reserve releases details on the stress tests conducted to assess the financial soundness of the 19 largest US financial institutions, declaring that most banks currently have capital levels well in excess of the amount required for them to remain well capitalised.
7 May	The ECB's Governing Council decides in principle that the Eurosystem will purchase euro-denominated covered bonds; the US authorities publish the results of their stress tests and identify 10 banks with an overall capital shortfall of $75 billion, to be covered chiefly through additions to common equity.

[1] See Chapter VI of the BIS's *78th Annual Report*, June 2008, for a more comprehensive list of events up to March 2008.

Sources: Bank of England; Federal Reserve Board; Bloomberg; *Financial Times*; *The Wall Street Journal*. Table II.1

Stage two: events leading up to the Lehman Brothers bankruptcy (mid-March to mid-September 2008)

With the economic outlook deteriorating ...

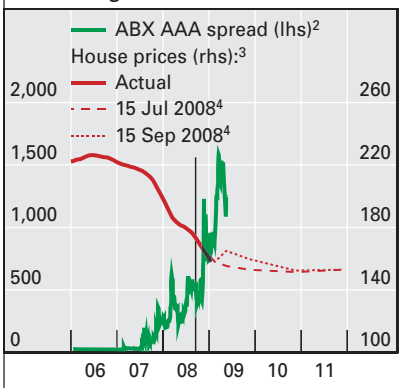
During the second stage of the crisis, after a short respite following the takeover of Bear Stearns on 16 March, financial asset prices came under renewed pressure. A distinctive feature of the period up to mid-September was an increased investor focus on emerging signs that the deepening US recession had spilled over to other major economies, triggering a synchronised economic downturn. The resulting outlook for earnings, defaults and associated financial sector losses renewed stress on bank balance sheets, raising concerns about banks' ability to proceed with their recapitalisation plans. Investor attention thus turned increasingly from questions about funding liquidity to those about bank solvency, putting particular strains on those institutions known to be highly leveraged and exposed to impaired assets.

... and interbank markets strained ...

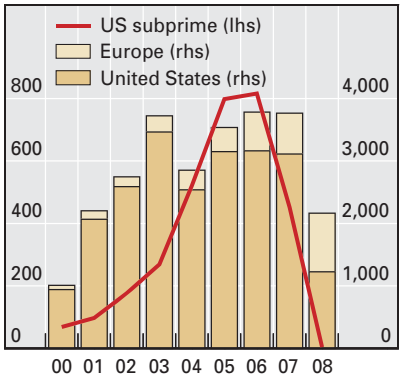
Although the Bear Stearns rescue ushered in a period of relative stability and rising prices for financial assets, interbank markets failed to recover. Spreads between interbank rates for term lending and overnight index swaps (OIS) continued to hover at levels significantly above those observed before August 2007 (Graph II.1; Graph II.4, left-hand panel). Banks, therefore, appeared

Mortgage and securitisation markets

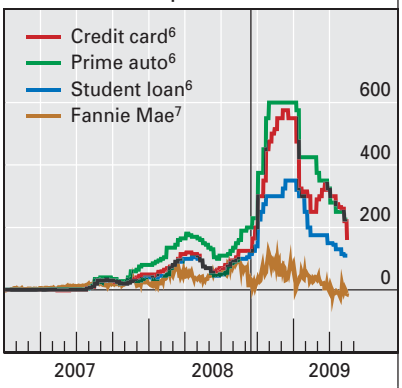
Housing indicators[1]



ABS issuance volume[5]



US AAA ABS spreads[1]



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Implied index spreads from CDS contracts on subprime mortgage bonds (index series ABX HE 06-01), in basis points. [3] S&P/Case-Shiller 10 home price index; January 2000 = 100. [4] Implied by prices of futures contracts. [5] In billions of US dollars; includes agency and private label securitisations. [6] Three-year floating spreads over Libor, in basis points. [7] JPMorgan index; option-adjusted spreads over Libor, in basis points.

Sources: Bloomberg; JPMorgan Chase; SIFMA; BIS calculations. Graph II.2

reluctant to commit their balance sheets to lending activities involving other banks, with the premium charged for such interbank loans pointing to some combination of greater preference for liquidity and concerns about counterparty risk. Concerns persisted despite unprecedented measures taken by central banks to support money market functioning and to substitute for the funds previously supplied by the broader financial markets, including through US dollar swap facilities with the Federal Reserve (see Chapter VI for details on these and subsequent policy responses to the crisis).

... concerns over capital positions resurfaced ...

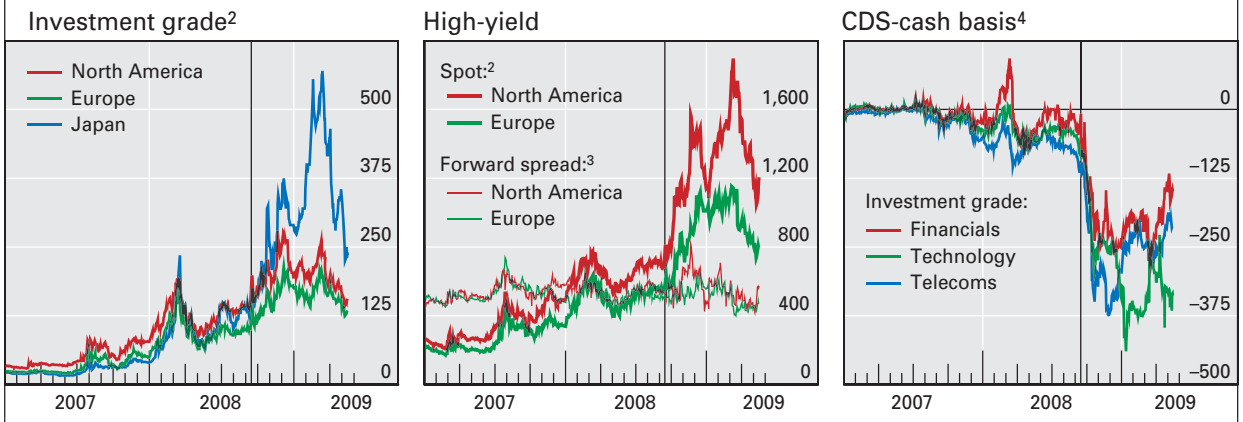
Pressing concerns about banks' capital positions resurfaced in June, following negative news about the troubled monoline insurance sector.[2] Moody's and Standard & Poor's had taken negative rating actions on MBIA and Ambac, two major monolines, early in the month, the first in a sequence of downgrades of similar insurers over the following weeks. Related fears about valuation losses on the securities insured by these companies added to news about weak investment bank earnings. As a result, valuations in both credit and equity markets deteriorated on a broad basis from mid-June (Graphs II.3 and II.7, left-hand panels), with financial sector assets leading the decline in the broader market indices.

... putting particular pressure on the US housing GSEs

Financial sector pressures were most acute, however, for the two major US housing finance government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac. Against the backdrop of further weakness in housing markets, house price depreciation in the United States was projected to extend well into the future (Graph II.2, left-hand panel). As a result, and despite announcements by their regulator that the GSEs remained adequately capitalised, credit spreads

[2] Monoline insurers provide credit enhancement to bonds and structured finance instruments, including guarantees on senior tranches of securities backed by mortgages or other assets as well as on municipal bonds. In this context, the monolines' own credit ratings will tend to determine the ratings of the instruments they insure.

Major investment grade and high-yield credit indices[1]



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Five-year on-the-run CDS mid-spread on index contracts of investment grade (CDX North America; iTraxx Europe; iTraxx Japan) and sub-investment grade (CDX High Yield; iTraxx Crossover) quality, in basis points. [3] Implied five-year CDS spread five years forward, calculated with a recovery rate of 40% assuming continuous time and coupon accrual, in basis points. [4] Difference between CDS and corresponding cash (asset swap) spreads for large samples of US borrowers.

Sources: JPMorgan Chase; BIS calculations. Graph II.3

on their debt and on mortgage-backed securities (MBS) underwritten by these institutions had risen back to levels last seen in March around the time of the Bear Stearns takeover (Graph II.2, right-hand panel). Equity prices plummeted, generating valuation losses of more than 70% from the levels at end-May 2008. With much of the remaining mortgage origination activity dependent on agency guarantees, the US government stepped in on Sunday 13 July, enabling the US Treasury to increase an existing line of credit and to purchase GSE stock.

Backstop measures for the GSEs ...

These backstop measures for the US GSEs provided some temporary relief across financial markets. Credit spreads tightened and equity prices began to recover part of their previous losses. The introduction of new US Securities and Exchange Commission (SEC) emergency measures curbing short selling of stocks in the largest banks and brokerage firms also helped ease pressures. As a result, and reflecting generally declining risk premia, implied volatilities across asset classes retreated from their previous highs but stayed above the levels prevailing at the start of the first stage of the crisis, in mid-2007 (Graph II.5).

At the same time, uncertainties about bank funding needs and counterparty risk persisted in money markets. Thus, Libor-OIS spreads remained elevated for key currencies, including the US dollar. Similar patterns in foreign exchange swap markets reflected asymmetric funding pressures in US dollars and other currencies that were pushing up the cost of dollar funds (Graph II.4).[3] This was despite steps taken by the US authorities in late July to enhance the effectiveness of liquidity facilities introduced around the time of the Bear Stearns takeover. These enhancements included longer-maturity

[3] See N Baba and F Packer, "Interpreting deviations from covered interest parity during the financial market turmoil of 2007–08", *BIS Working Papers*, no 267, December 2008, for a discussion of the spillover effects between money markets and foreign exchange swap markets.

(84-day) loans under the Term Auction Facility (TAF), with correspondingly longer terms on US dollar funds auctioned by both the ECB and the Swiss National Bank.

... were followed by an outright bailout

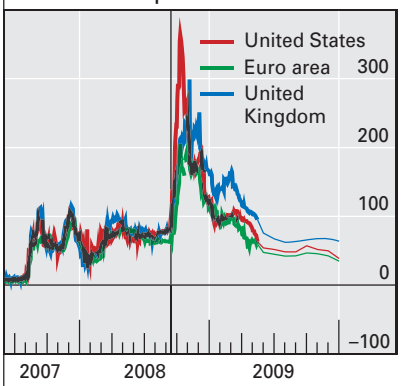
Pressures in housing markets also persisted, reigniting investor concerns about the health of the US housing GSEs. Prices for GSE shares resumed their previous slide and, following news of larger than expected quarterly losses at both Fannie Mae and Freddie Mac in August, fell to levels not seen since the late 1980s. Confidence in the continued solvency of the two GSEs vanished, and the US government formally took control on Sunday 7 September. The takeover largely eliminated credit risk for both senior and subordinated holders of GSE debt while diluting equity holdings through the government's new senior preferred equity stake. This development foreshadowed the effects of future bank rescue packages, and was thus a source of uncertainty regarding the implications of such future measures for claims at different levels of seniority.

But broader strains failed to ease ...

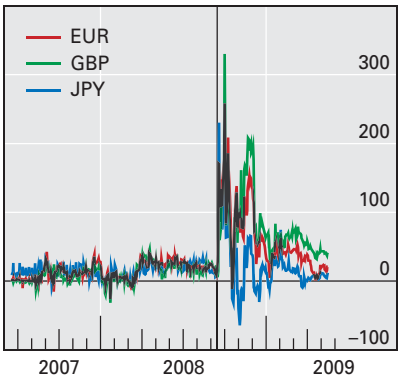
While news of the takeover led to tightened spreads on GSE-sponsored MBS and debt instruments, it failed to ease concerns about the financial sector more broadly. Instead, it served as a reminder of additional losses to come on top of the $500 billion or so in global writedowns that had accumulated by the end of August 2008. It also suggested that central bank efforts aimed at substituting for market-provided funding had probably run their course, with investors increasingly focusing on issues of solvency. Thus, when investor attention turned away from the US housing GSEs to refocus on bank balance sheets, financial equity prices and credit spreads came under renewed pressure. This, in turn, added to banks' problems in replenishing their capital bases and satisfying their funding needs in markets unwilling to accept

Funding markets[1]

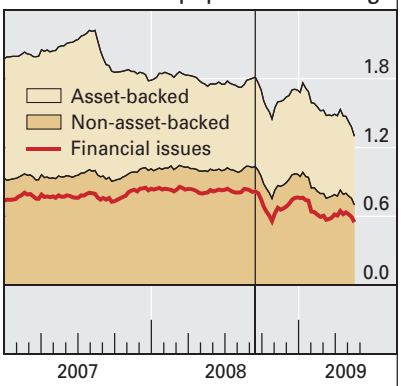
Libor-OIS spread[2]



FX swap spreads[3]



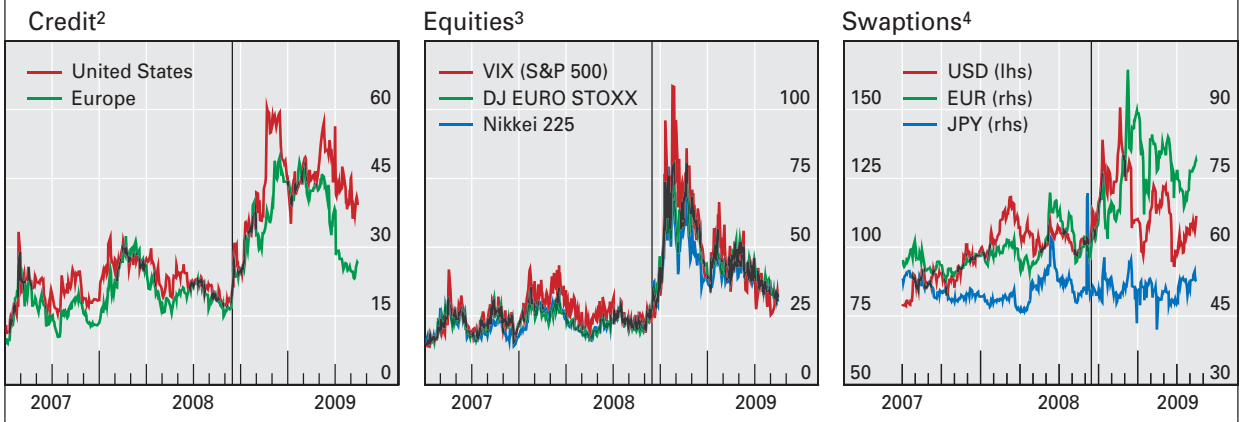
US commercial paper outstanding[4]



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Three-month Libor rates minus corresponding OIS rates (for the euro area, EONIA swap), in basis points. The thin lines show forward spreads, calculated as the difference between three-month forward rate agreement (FRA) rates and corresponding implied OIS rates, as at 28 April 2009. [3] Spread between the three-month FX swap-implied dollar rate and three-month Libor; the FX swap-implied dollar rate is the implied cost of raising US dollars via FX swaps using the funding currency; in basis points. For details on calculation, see N Baba, F Packer and T Nagano, "The spillover of money market turbulence to FX swap and cross-currency swap markets", *BIS Quarterly Review*, March 2008. [4] In trillions of US dollars.

Sources: Federal Reserve Board; Bloomberg; BIS calculations. Graph II.4

Implied volatility measures[1]



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Implied daily absolute spread movements; calculated from at-the-money one- to four-month implied volatilities and observed index spreads (United States: CDX High Yield; Europe: iTraxx Crossover), in basis points. [3] Volatility implied by the price of at-the-money call option contracts on stock market indices, in per cent. [4] Deutsche Bank index representing implied swaption volatility measured in annualised basis points based on one-year (euro: two-year) swaptions.

Sources: Bloomberg; JPMorgan Chase; BIS calculations. Graph II.5

anything but top-quality collateral. The resulting strains were broad-based. Even so, there were signs of differentiation based on banks' business models and the implications of those models for exposures to impaired assets, funding and leverage. In that environment, the major investment banks experienced the heaviest pressure (Graph II.10).

... with the major investment banks ...

When a long-awaited capital injection for Lehman Brothers did not materialise in early September, pressures on that investment bank became particularly intense. Spreads on CDS insuring Lehman's debt surged almost 200 basis points, to around 500, causing the firm's clearing agent to demand additional powers to seize collateral and short-term creditors to cut lending lines. The company's already battered stock fell 45% on Tuesday 9 September, and it dropped further the following day when weak results for the third quarter of 2008 were released. Despite the simultaneous announcement of plans to spin off business units, confidence in the firm's ability to secure urgently needed funding faded quickly. This, in turn, triggered speculation that the authorities would try to broker a Bear Stearns-style takeover the following weekend, 13–14 September.

... and Lehman Brothers, in particular, facing the most severe problems

The crisis of confidence

Stage three: global loss of confidence (15 September to late October 2008)

The Lehman failure ...

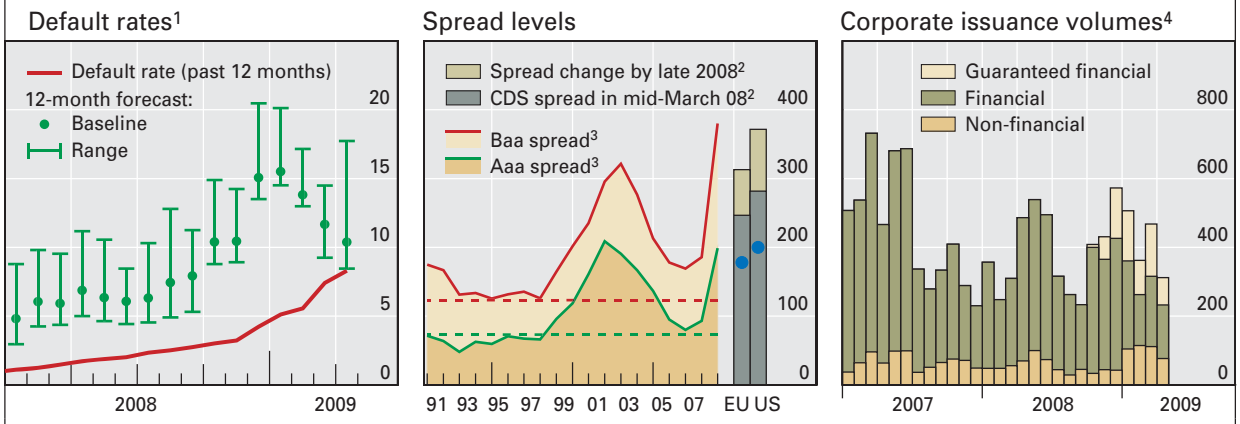
The tipping point came on Monday 15 September, when Lehman Brothers Holdings Inc filed for Chapter 11 bankruptcy protection: what many had hoped would be merely a year of manageable market turmoil then escalated into a full-fledged global crisis. Suddenly, with markets increasingly in disarray, a growing number of financial institutions were facing the risk of default. The resulting crisis of confidence quickly spread across markets and countries,

making it obvious that policy action would have to shift from liquidity support to broader-based measures, including system-wide bank recapitalisations. At the same time, as emerging markets were hit by collapsing exports and tightening financing conditions, the universal nature of the crisis became increasingly evident, as did the need for a global policy response.

Going into Lehman's bankruptcy filing, concerns had centred on the company's role as a broker and reference entity (ie the source of default risk that buyers of protection seek to insure against) in the CDS market. In fact, exposures to Lehman's outstanding debt securities turned out to be more fateful. Three events helped to shield CDS market participants from the Lehman failure. First, a special trading session was organised on Sunday 14 September, just before the bankruptcy filing. The objective was to help the main CDS dealers net out counterparty positions involving Lehman and rebalance their books through the replacement of trades. Second, AIG, a large insurer known to be holding more than $440 billion of notional positions in CDS contracts – often monoline insurance-type transactions involving client banks – received a government support package on 16 September. That package, which would be repeatedly restructured and extended during the following months, prevented the disorderly failure of AIG. It also kept CDS-related risks from being brought back onto clients' balance sheets in an already fragile environment. Third, Lehman-referencing CDS exposures turned out to be smaller than feared. They eventually translated into relatively modest net settlement payments of about $5.2 billion, which would be closed out without incident in late October. Consequently, the CDS market infrastructure held up rather well. Even so, market opacity added to policy uncertainty during the days immediately preceding the bankruptcy filing and exacerbated existing strains

... caused counterparty risk to soar ...

Default rates, credit spread levels and issuance volumes



[1] Moody's global 12-month issuer-weighted speculative grade default rates for 2008–09, in per cent; forecasts refer to the 12-month period starting at the reporting date. The range is defined by pessimistic/optimistic scenarios around the baseline. [2] Investment grade CDS spread levels over Treasuries (Europe: iTraxx; United States: CDX), adjusted with five-year US dollar swap spreads, in basis points. The blue dots indicate the CDS spread level prevailing in mid-May 2009; late 2008 refers to 5 December for the European Union and 20 November for the United States. [3] Moody's average monthly global investment grade bond spreads over Treasuries, in basis points; the dashed lines represent historical averages of monthly spreads from 1919 to 2008. [4] Syndicated international and domestic debt securities placed by private issuers, in billions of US dollars. The sectoral allocation reflects the characteristics of the immediate issuer.

Sources: Federal Reserve Bank of New York; Bloomberg; Dealogic; JPMorgan Chase; Moody's. Graph II.6

Money market funds amplify instability in the wake of the Lehman failure

A loss of confidence in US dollar money market funds amplified the financial strains arising from the September 2008 Lehman Brothers failure. The following discussion illustrates why the run on these funds coincided with the deterioration in global interbank markets.

The build-up to the run on money market mutual funds

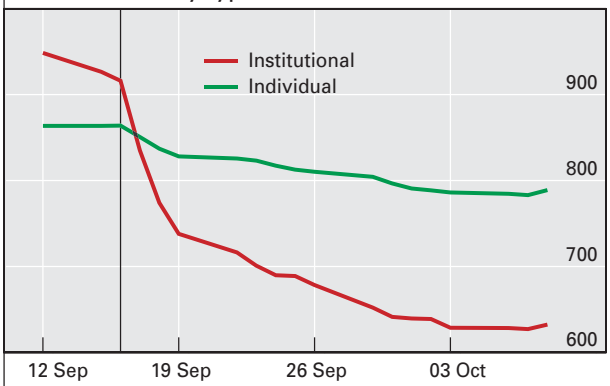
As documented more fully in Chapter III, non-US banks' overall need for US dollar funding was an unchecked vulnerability in the global financial system ahead of the financial crisis. European banks in particular had increased their US dollar assets sharply over the past decade, to more than $8 trillion by mid-2007. Moreover, these exceeded their estimated US dollar liabilities by more than $800 billion, implying cross-currency financing and hence a heavy reliance on instruments such as foreign exchange swaps. Banks also financed their positions by borrowing directly in other wholesale interbank funding markets and from non-bank providers of short-term funding, such as money market funds.[1]

When dollar funding in interbank markets dried up starting in August 2007, European banks increasingly turned to foreign exchange swap markets to obtain dollars against European currencies, driving the corresponding funding cost well above an already elevated US Libor rate (Graph II.4, centre panel). Such interbank market strains made it critical for non-US banks to retain access to other sources of dollar funding, especially the largest: US dollar money market funds. Most funds that purchase private paper, so-called "prime" funds, invest heavily in non-US issuers. Records of the mid-2008 holdings of the 15 largest prime funds, accounting for over 40% of prime funds' assets, show that these placed half of their portfolios with non-US banks (and roughly 85% of that sum with European banks). Thus, US money market fund investments in non-US banks reached an estimated $1 trillion in mid-2008 (out of total assets of over $2 trillion), more than 15% of European banks' total estimated US dollar liabilities to non-banks.

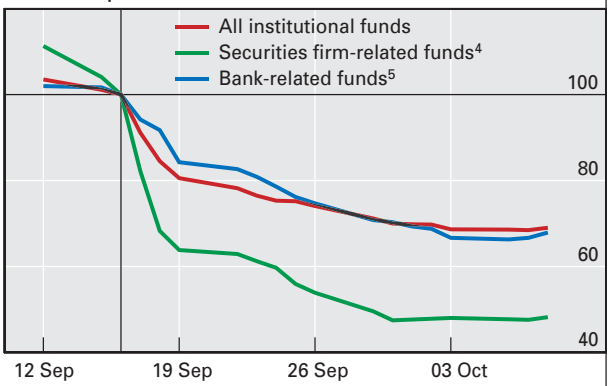
Until September 2008 US dollar financing continued to be forthcoming, and US money market funds appear to have increased their outright investment in non-US banks in the period immediately preceding the Lehman failure. Assets at US money funds grew strongly as investors withdrew from less safe short-term investments. Non-US banks benefited as prime fund managers adopted a less risky investment mix and shifted their portfolios away from commercial paper (CP) towards certificates of deposit (CDs). This shift suggests that prime funds increased their role as providers of unsecured dollar funding to non-US banks, given the much larger share of non-US banks as issuers of CDs than of CP held by those funds. At the same time, the shift also meant that any run on dollar money market funds was bound to result in funding difficulties for European banks.

Assets of US prime money market funds

Prime funds by type[1, 2]



Selected prime institutional funds[2, 3]



[1] In billions of US dollars. [2] The vertical line marks 16 September 2008, the day after Lehman Brothers filed for Chapter 11 bankruptcy protection and the date on which Reserve Management Co announced that shares in both its flagship fund and its Caribbean fund were worth less than one dollar. [3] 16 September 2008 = 100. [4] Goldman Sachs, Merrill Lynch and Morgan Stanley. [5] Bank of America (Columbia), Bank of New York (Dreyfus), Barclays, JPMorgan Chase, State Street, Wachovia (Evergreen) and Wells Fargo.

Sources: Crane Data; BIS calculations. Graph II.A

The run on US money market funds

On 16 September, the day after Lehman's failure, Reserve Management Co, manager of the fastest-growing fund family over the previous several years, announced that, due to losses on Lehman notes, shares in its flagship fund, Reserve Primary, were worth 97 cents and those in its Caribbean fund 91 cents. Reserve Primary's "breaking the buck" was without precedent for a major fund, and only the second instance in the history of all money market funds. It set off broad-based, though differentiated, shareholder redemptions that resembled a bank run. Reserve Primary had $25 billion of redemption orders on 15 September and by 19 September another $35 billion, for a total of $60 billion out of $62 billion. Although it reported an unbroken buck, Reserve's $10 billion US Government Fund faced some $6 billion in redemption payments. Other prime funds also suffered redemption calls; meanwhile, government funds received inflows.[2]

Institutional investors fled much more quickly than individual investors. On the Wednesday and Thursday following Tuesday's breaking of the buck, institutional investors liquidated $142 billion in 102 prime institutional funds, 16% of their holdings (Graph II.A, left-hand panel). On those same days, they purchased $54 billion in government funds, a similar percentage increase. Individuals sold a more modest $27 billion from prime funds (3%) and bought a net $34 billion in government funds.

The largest redemptions occurred at prime institutional funds managed by those remaining securities firms and small independent managers that investors doubted could support their funds. Two-day redemptions at the largest prime institutional funds managed by the three largest securities firms ranged from 20 to 38% of assets, well above the 16% average. By contrast, the largest such funds managed by affiliates of seven large banks met two-day calls of between 2 and 17% of assets (Graph II.A, right-hand panel).

The flight to safety, represented by both the shift to government funds and changing portfolio compositions, resulted in new demand for Treasuries, agency securities and repos at the expense of demand for CP and bank CDs. Prime funds' holdings of repos, at 11% of portfolio, could not meet even the first two days' redemptions at many funds. Liquidating repos forced up average maturities and led funds to reinvest only at the very short term.

The run on money market funds thus threatened a run first on the CP market and then on the CD market and thereby on non-US banks, destabilising already strained global bank funding markets. The policy responses designed to stop this run, and the degree to which they replaced private with public funding, are discussed in Chapter VI.

[1] See P McGuire and G von Peter, "The US dollar shortage in global banking", *BIS Quarterly Review*, March 2009. [2] See N Baba, R McCauley and S Ramaswamy, "US dollar money market funds and non-US banks", *BIS Quarterly Review*, March 2009.

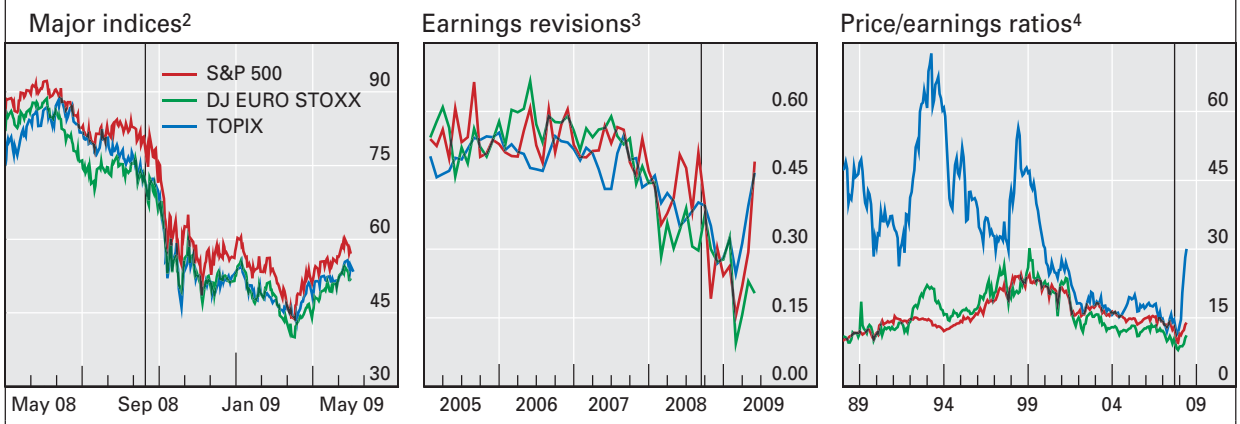
in funding markets.[4] Those markets now came under pressure from losses on exposures of money market mutual funds to short- and medium-term notes issued by Lehman.

The systemic nature of money market fund exposures became apparent when a large US fund, Reserve Primary, wrote off more than $780 million worth of Lehman debt (see box). As a result, Reserve Primary became the first major money market mutual fund ever to "break the buck", ie report less than one dollar's worth of net assets for each dollar invested. This event, in turn, triggered unprecedented volumes of US money market fund redemptions – a "bank run" in all but name – forcing fund managers to liquidate assets into essentially illiquid markets. While pressure across funds was not uniform, strains quickly spilled over into the markets for commercial paper (CP) and bank certificates of deposit, where money market funds are a key investor group.

... as an investor run on money market funds ...

[4] See *BIS Quarterly Review*, December 2008, pp 6–7, for a more detailed discussion.

Equity market indicators[1]



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] In local currency; 1 October 2007 = 100. [3] Diffusion index of monthly revisions in forecast earnings per share, calculated as the percentage of companies for which analysts revised their earnings forecast upwards plus half of the percentage of companies for which analysts left their forecast unchanged. [4] Based on consensus forecasts for one-year operating earnings.

Sources: Bloomberg; I/B/E/S; BIS calculations. Graph II.7

Unsecured financial paper suffered the largest outflows: total outstanding CP volumes in the United States plummeted by more than $325 billion between 10 September and 22 October, from a total of about $1.76 trillion (Graph II.4, right-hand panel). Foreign banks and those US institutions without their own retail deposit base thus lost access to an important source of funds at a time when they needed to support – or take onto their balance sheets – the money market funds that they sponsored. In response, demand for US dollar interbank funds surged, causing short-term credit and money markets to seize up.

... quickly spread through the financial system

The resulting turmoil quickly spread through the global financial system. With banks hoarding liquidity, US dollar Libor-OIS spreads surged from already elevated levels of around 80 basis points in early September to near 250 points at the end of the month. Movements in other markets, such as those for euro and sterling funds, showed similar signs of disruption. Strains were particularly evident for foreign exchange swaps, where rising financial sector credit spreads and the mounting global demand for US dollar funds raised the implied cost of dollars to historically high levels above Libor (Graph II.4). With the viability of key players suddenly challenged and perceptions of counterparty risk spiking, the benchmark US investment grade CDS index spread jumped by 42 basis points on 15 September alone, and US high-yield spreads rose 118 basis points on the same day (Graph II.3). Credit spreads in other major markets moved by similar amounts, in tandem with their US counterparts. Equity prices fell by some 4% in the United States and Europe on the day of the Lehman bankruptcy and declined further until 17 September (Graph II.7).

Despite a first round of policy initiatives ...

In an environment of acute systemic pressure, policymakers increased the pace and scope of their initiatives. On 18 September, UK bank HBOS was forced into a government-brokered merger with one of its competitors. Concomitantly, the UK authorities sought to ease pressure on financial stocks through a suspension of short selling – the US authorities followed suit the very next day. Simultaneously, major central banks reacted with a new round

of coordinated measures to address the squeeze in US dollar short-term funding. These actions were followed on 19 September by the US Treasury's announcement of a temporary guarantee for money market fund investors, a measure aimed at arresting the escalating run on the US money market mutual fund sector. Redemptions slowed in response, with total assets eventually returning to their pre-15 September levels.

... financial sector pressures did not abate ...

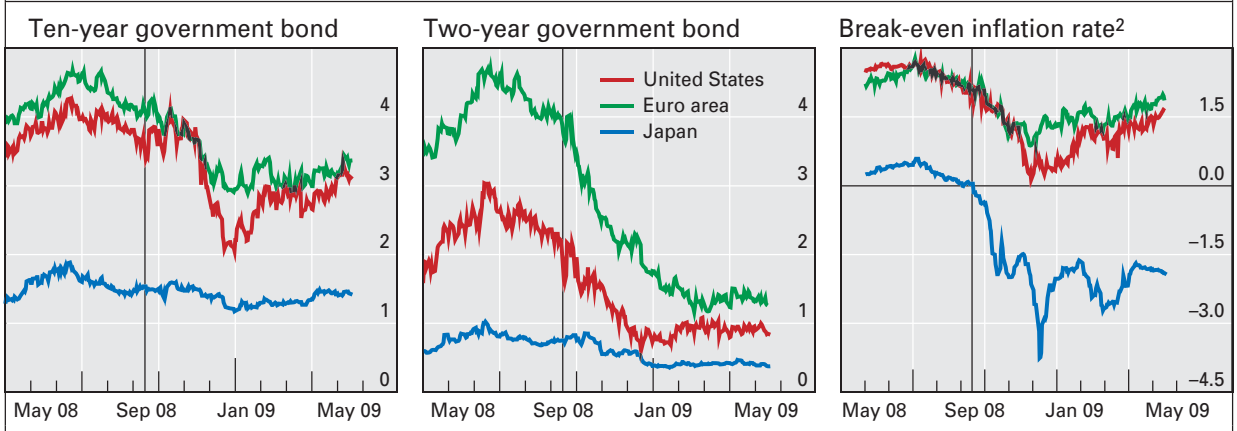
Markets recovered from the initial reaction to the Lehman bankruptcy, but pressure on banks and other financial sector firms did not abate. Helped by early details of a proposed $700 billion US plan to take troubled assets off the books of financial institutions, credit spreads retreated temporarily from the highs reached earlier in the week. Equity markets also recovered, aided in part by the new ban on short sales. The S&P 500 rebounded 4% on 19 September, with several high-profile banking stocks rising even more sharply, and European stock markets gained more than 8% on the same day. Even so, on Sunday 21 September, in a move aimed at halting ongoing transfers of counterparty positions and client funds to third parties, investment banks Goldman Sachs and Morgan Stanley obtained permission from the US authorities to convert themselves into bank holding companies, and US thrift institution Washington Mutual was taken over by the authorities during the following week.

... forcing support measures by an increasing number of governments

The ultimate proof of the depth and breadth of the crisis came on Monday 29 September. That day, authorities in a number of European countries were forced to counter threats to the stability of individual institutions within their national banking systems. Following negotiations over the weekend, the United Kingdom moved to nationalise mortgage lender Bradford & Bingley, while banking and insurance company Fortis received a capital injection from a group of three European governments. On the same day, Hypo Real Estate,

Nominal government bond yields and break-even rates[1]

In per cent



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Nominal minus real 10-year zero coupon bond yields. For the United States and the euro area, zero coupon break-even rates are calculated as in R Gürkaynak, B Sack and J Wright, "The TIPS yield curve and inflation compensation", *Finance and Economics Discussion Series,* 2008-05, Board of Governors of the Federal Reserve System; for Japan, Bloomberg.

Sources: Bloomberg; BIS calculations. Graph II.8

a German commercial property lender, secured a government-facilitated credit line, which was later backed up by additional support measures.

Confidence in the stability of banks was lost ...

These measures notwithstanding, confidence in the stability of the banking system had been lost: financial markets were now clearly focusing on the need for comprehensive policy action. Later on 29 September, when the US House of Representatives voted to reject the first version of the Treasury's proposed rescue plan for the US financial industry (it would be passed into law in revised form at the end of that week), the market response was swift: the S&P 500 fell 8.8%, with the decline again led by financial shares, and other indices saw comparable percentage declines that would accumulate to losses of about 30% by late October. Credit markets came under extreme pressure as well, with the major CDS index spreads surging back to, and surpassing, the highs reached in the days immediately after the Lehman failure. Longer-term government bond yields fell (Graph II.8) and volatilities spiked across asset classes (Graph II.5) as the deepening crisis resulted in a broad-based flight to quality.

... on a global scale ...

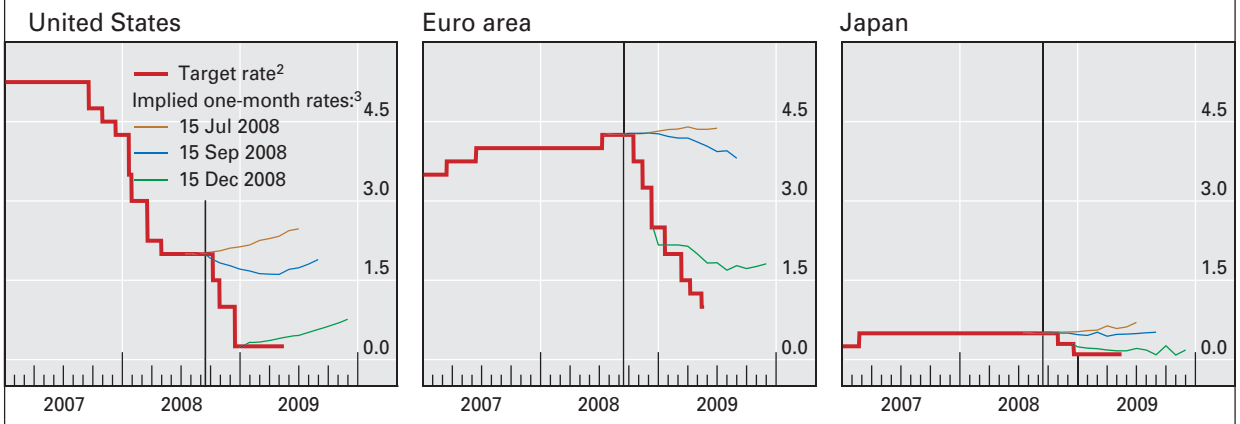
Emerging market countries were being increasingly drawn into the unfolding turmoil, even though their direct exposures to impaired assets were known to be limited. Having outperformed their industrial country counterparts between the beginning of the crisis (August 2007) and May 2008, emerging market stocks, as measured by the MSCI index, dropped by about 28% in local currency terms between mid-May and the day before the Lehman failure (compared with a loss of about 12% for the S&P 500). Up to that point, losses had been driven largely by the implications of the crisis for export demand, both directly and through the impact of weakening demand on commodity prices (see Chapter V). Following the Lehman event, emerging market assets weakened further on a broad basis as fears about the stability of banking systems in the major economies triggered a combination of concerns about collapsing global growth, lower commodity prices and the availability of external sources of funding. In response, sovereign spreads widened dramatically and equities, which plummeted in tandem with those in the industrial economies, weakened significantly more than during past periods of market turbulence (Graph II.11).

... and emerging market assets were drawn into ...

While pressures were particularly intense for countries that investors regarded as among the most vulnerable, signs of more indiscriminate asset disposals emerged in the course of October. Concerns about access to foreign funding became apparent early in the month, when the near simultaneous demise of three Icelandic banks caused international investors to reassess their exposures to countries with large current account deficits and associated financing needs, including those in central and eastern Europe (see Chapter V). In recent years, a sizeable fraction of the capital inflows into markets with foreign-dominated banking systems – and the resulting access to large pools of foreign currency deposits – had been in the form of foreign currency loans to businesses and households. Now lenders became more hesitant to roll over existing loans or to extend new ones. In addition, as key parts of the global financial system turned dysfunctional, plummeting valuations in industrial country markets increasingly translated into heavy banking and portfolio flows out of emerging market assets. Pressure on asset prices mounted and market

Policy rates and implied expectations[1]

In per cent



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Central bank policy rate; for the United States, target federal funds rate; for the euro area, interest rate on the main refinancing operations; for Japan, target for the uncollateralised overnight call rate. [3] Observations are positioned on the last business day of the month indicated in the legend; for the United States, federal funds futures; for the euro area, EONIA swap; for Japan, yen OIS.

Sources: Bloomberg; BIS calculations. Graph II.9

volatility surged. This broadened the sell-off, despite efforts by emerging market central banks to enhance their domestic and foreign currency lending operations and, in several countries, the announcement of full or partial guarantees of bank deposits. As a result, the MSCI emerging market index would lose about 40% from its level just before the Lehman failure, reaching values last seen in October 2004.

... a broadening sell-off

By mid-October 2008, with the flurry of unprecedented policy initiatives taken across countries increasingly adding up to a joint approach, markets were finally showing signs that the crisis of confidence had been arrested. On 8 October, the authorities in the United Kingdom announced comprehensive measures to recapitalise UK banks. The move was followed by the first ever round of coordinated cuts in policy rates by six major central banks, including the ECB, the Bank of England and the Federal Reserve. Efforts to implement additional, broad-based policy measures continued in the following weeks: on 13 October, for example, the Federal Reserve and other major central banks increased existing swap lines to accommodate unlimited quantities of US dollar funds. On the same day, the euro area member countries jointly announced guarantees and equity injections aimed at stabilising the banking sector. These were followed, on 14 October, by news that the US Treasury would use $250 billion of the previously authorised $700 billion rescue package to recapitalise major banks. Given that large amounts of financial institutions' senior liabilities had thus effectively become quasi-government debt, investors reacted by pushing financial sector spreads down from the peaks reached earlier in the period under review (Graph II.10, left-hand panel).

The crisis of confidence was arrested ...

... in the wake of coordinated policy action ...

Signs of easing pressures were also evident in other markets. After peaking at 364 basis points on 10 October, the three-month US dollar Libor-OIS spread steadily fell, ultimately dipping below 100 basis points in January 2009 (Graph II.4, left-hand panel). Euro and sterling Libor-OIS spreads

... and signs of easing pressures were evident across markets

behaved in a similar fashion, suggesting that interbank markets had begun to stabilise. In the meantime, key equity indices showed temporary signs of relief, rebounding from lows reached in late October. Conditions in emerging markets also stabilised, following successful efforts by a number of countries to obtain assistance from the IMF and other international bodies as well as news, on 29 October, that the Federal Reserve had established US dollar swap lines with key emerging market monetary authorities. However, asset prices remained under pressure from country-specific vulnerabilities, contributing to the underperformance of credit and equity indices for emerging Europe (Graph II.11, left-hand and centre panels).

Global macroeconomic and financial spillovers

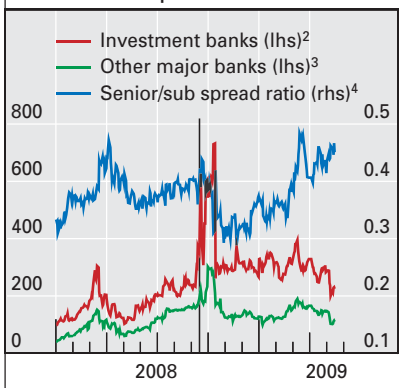
Stage four: investors focus on the global economic downturn (late October 2008 to mid-March 2009)

Recession fears took centre stage …

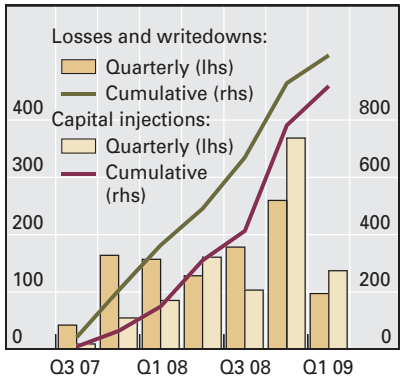
The next crisis stage, starting in late October, was one of uncertainty with regard to both financial sector stability and the likelihood of a deepening global recession. Although the global crisis of confidence had come to an end, policy action continued on an international scale as governments sought to support market functioning and to cushion the blow of rapid economic contraction. Even so, with many details unspecified, questions about the design, impact and consistency of these measures remained. As a result, financial markets were roiled by increasingly dire macroeconomic data releases and earnings reports, punctuated by short-lived periods of optimism – often in response to the announcement of further government interventions.

Financial sector indicators

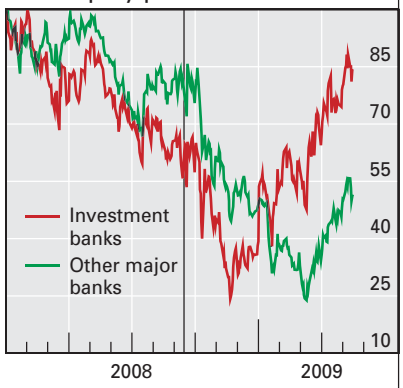
Bank CDS spreads[1]



Bank losses and capital injections[5]



Bank equity prices[1, 6]



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Equally weighted average of CDS spreads (in basis points) for four major investment banks; includes Lehman Brothers until 15 September 2008 and Merrill Lynch until 31 December 2008. [3] Equally weighted average of CDS spreads (in basis points) for 14 major international banks. [4] Ratio of senior over subordinated CDS spreads for the 18 international banks in the other spread series, rescaled to imply the average recovery rate on senior bank CDS; assumes a subordinated recovery rate of 10%. [5] In billions of US dollars; data from Q3 2008 onwards include government injections of capital. [6] Equally weighted average of equity prices in US dollars for the 18 international banks in the left-hand panel; 1 January 2008 = 100.

Sources: Bloomberg; Markit; BIS calculations. Graph II.10

... as yields were pushed down ...

Recession fears were clearly evident from government bond yields, which continued on a downward trajectory in November and December. Reductions in policy rates and a flight to safety pushed US and euro area two-year yields dramatically lower, below 1% and 2%, respectively, by mid-December (Graph II.8, centre panel). US 10-year yields, in turn, fell to a record low near 2.05% on 30 December (the previous record was around 2.10%, established in 1941). In line with these yield movements, expectations about the path of near-term policy rates were revised downwards. Meanwhile, federal funds futures prices signalled expectations of low and broadly steady policy rates in the United States for much of 2009, consistent with depressed to negative growth over the coming quarters. In the euro area, interest rate swap prices pointed to expectations of a further lowering of policy rates by the ECB over the next 12 months, reflecting in part the relatively slow pace of ECB rate adjustments seen since the start of the crisis. In Japan, where the policy rate had been cut in late October, forward rates suggested expectations of unchanged policy rates for most of 2009. In turn, break-even inflation rates (ie the difference between nominal and inflation-indexed yields) were in line with expectations of rapid disinflation, especially at shorter horizons. At the same time, movements in long-term break-even rates seemed to be due largely to technical factors, such as safe haven demand for the liquidity of nominal Treasuries and rising liquidity premia in index-linked bonds. By introducing a pessimistic bias, these technical factors thus limited the usefulness of long-term break-even rates as an indicator of inflation expectations (Graph II.8, right-hand panel).[5]

... inflation expectations were adjusted ...

Both credit and equity markets recovered somewhat into the new year, as previous policy actions showed signs of traction. One such example of tentative, policy-induced normalisation in a disrupted market was the US securitisation sector, where spreads for agency MBS and bonds as well as securities backed by consumer loans eased in response to a number of support measures announced after the Federal Reserve's first such initiative, on 25 November (Graph II.2, right-hand panel).

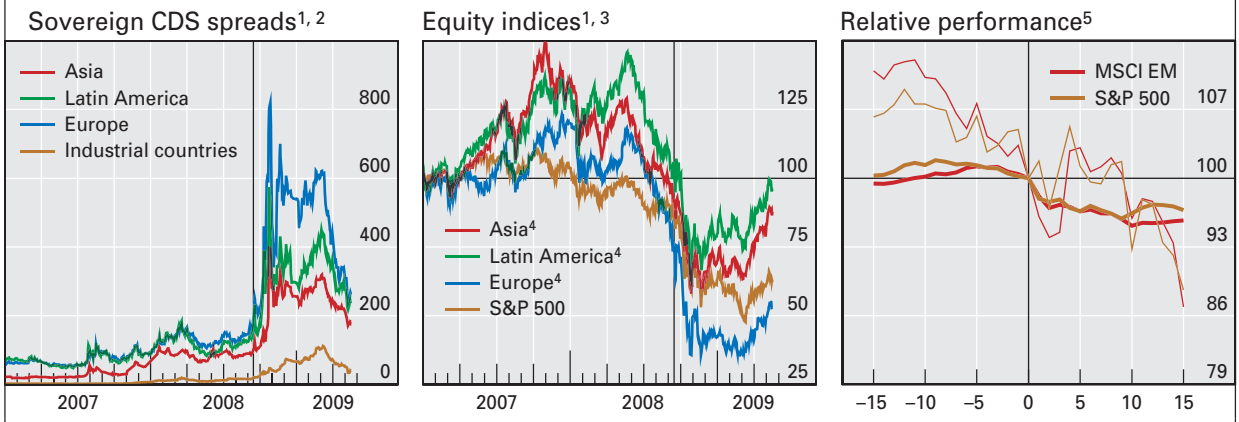
... and asset prices were driven lower

However, when the scale of the global economic downturn became fully apparent in January 2009, prices for financial assets were dragged lower once again. Against the background of weak fourth quarter data that suggested that economic activity was in the midst of the worst slump in decades (see Chapter IV for details), markets resumed their earlier slide. Major equity indices declined in the wake of deteriorating earnings; they would continue to do so into March, eventually falling back below the troughs reached in November (Graph II.7, left-hand and centre panels): on 9 March, the S&P 500 dropped to around 676 points, a level last seen in October 1996. Credit markets also weakened once again, as the ongoing slowdown in economic activity suggested further credit quality deterioration. An especially large widening in Japanese spreads (Graph II.3, left-hand panel) was accelerated by sectoral and credit quality-related index composition effects as well as by low market liquidity.

Emerging markets experienced similar pressures. GDP data for the fourth quarter confirmed the deepening impact of the financial crisis on economies

[5] See *BIS Quarterly Review*, March 2009, pp 10–11, for details.

Emerging market indicators



[1] The vertical line marks 15 September 2008, the date on which Lehman Brothers filed for Chapter 11 bankruptcy protection. [2] Weighted average of sovereign CDS spreads (in basis points), based on 2005 GDP and PPP exchange rates. Asia = China, India, Korea, Malaysia and the Philippines; Latin America = Brazil, Chile, Colombia, Mexico and Peru; Europe = the Czech Republic, Hungary, Poland, Russia and Turkey; industrial countries = France, Germany, Italy, Japan, the United Kingdom and the United States. [3] 3 January 2007 = 100. [4] Morgan Stanley Capital International emerging market price indices, in local currency terms. [5] Thick lines: average for the trading days before and after the start of 11 periods of turbulence, defined as sudden and sustained increases in the VIX index, between 2000 and July 2007; thin lines: over the trading days before and after the Lehman Brothers bankruptcy; day 0 = 100.

Sources: Datastream; Markit; BIS calculations. Graph II.11

Plunging exports weighed on emerging market assets ...

that had hitherto depended on exports to support growth, particularly in Asia. Korean fourth quarter GDP fell more than 3% year on year, and China reported a slowdown in growth of more than 4 percentage points over the same period, driven in part by falling export demand (see Chapter V for details). In a reflection of financial sector problems, the collapse in trade flows was probably exacerbated by counterparty risk concerns among banks involved in trade finance and by a related disruption of net flows of trade credit between exporting and importing countries. Plunging exports, in turn, were reflected in declining asset prices. However, compared with the immediate crisis of confidence in September and early October 2008, patterns across countries and regions were more differentiated (Graph II.11, left-hand and centre panels). The differentiation helped to cushion the impact on overall emerging market equity indices, which generally fared better during the fourth stage of the crisis than their industrial country counterparts. For example, although weakening from early January onwards, the MSCI emerging market index did not return to the lows established in late October, as countries from other regions compensated for the underperformance of economies across emerging Europe (Graph II.11, centre panel).

... and financial sector weakness re-emerged ...

Continued problems in the financial sector also drove part of the renewed weakness in the equity and credit markets of industrial countries. Signs that the sector's stability had not been restored on a sustained basis had emerged early in 2009, despite the injection of a combined $925 billion of private and government capital since the third quarter of 2007 (Graph II.10, centre panel). Losses at a large German bank had to be backstopped by a government bailout on 8 January, and similar measures followed across a number of European countries and in the United States. Financial sector credit spreads and equities thus led the deterioration in overall indices seen into March (Graph II.7).

At the same time, existing guarantees and expectations of further support measures generally limited movements in financial sector credit spreads. However, while state guarantees contributed to a surge in financial sector debt issuance (Graph II.6, right-hand panel), spreads no longer tightened in expectation of government support. In contrast with developments in late 2008, investors thus appeared to be increasingly uncertain about the necessary scope of such measures and about any impact on their debt holdings. Related uncertainties also contributed at times to significant pricing differences across the capital structure, reflecting changing expectations about relative recovery rates in the face of government intervention (Graph II.10, left-hand panel). Heavy discounts on subordinated debt, in turn, induced numerous banks to retire these securities and to bolster core capital through retained earnings. Meanwhile, equity prices for the former standalone investment banks outperformed those for the broader banking sector; that difference was in line with improved capital positions and signs that the cyclical deterioration had contributed to a shift in the focus of concerns about bank exposures from the trading book to the banking book (Graph II.10, right-hand panel; see also Chapter III).

... against the background of uncertainties about the scope ...

... and implications of government support

Uncertainty was also driven by indications that large-scale financial sector rescue and economic support packages were starting to strain government finances. Industrial country sovereign CDS spreads had drifted upwards from low levels ever since the initiation of the first backstop measures in the summer of 2008, and they rose further into March (Graph II.11, left-hand panel). Increases came in the wake of rising fiscal commitments, with correlation patterns among different sovereigns suggesting the presence of a strong common driver. Correlation between spreads for sovereign CDS and those for senior financial sector credit, in particular, increased relative to the period before the Lehman failure. This pattern was in line with investor beliefs that major governments had underwritten the risks of substantial parts of the banking system, but it did not necessarily reflect the specifics of these commitments at the individual country level. Similar developments were evident in government bond markets, where expectations regarding large future issuance volumes had started to offset the downward pressures exerted on yields by safe haven flows and the economic outlook (Graph II.8).

Sovereign CDS spreads widened ...

... on beliefs that the authorities had underwritten banking sector risks

Stage five: first signs of stabilisation (from mid-March 2009)

Events took another turn in mid-March. Volatilities declined and asset prices recovered from their previous lows, as further and more determined policy action induced markets to show some optimism in the face of what remained a largely negative macroeconomic and financial outlook. At the same time, and despite further improving conditions in a variety of markets, signs of dysfunction and related distortions remained, suggesting that the combined efforts of governments and central banks had not yet fully restored confidence in the global financial system. Thus, the process of normalisation seemed likely to be protracted and subject to considerable risks.

Events took another turn ...

A key factor behind improving asset valuations was the confidence effect from announcements by major central banks of expansions of both the range

... when further policy action ...

and the amount of assets that they would be prepared to purchase outright. Early in March, the Bank of England announced plans to purchase private sector assets and government bonds. On 18 March, the Federal Reserve followed with news that it would acquire up to $300 billion worth of longer-term Treasury securities. In anticipation of the extra demand, investors drove 10-year Treasury yields to their biggest one-day decline in more than 20 years – 47 basis points. Shorter-term Treasury yields also fell, as did yields on Japanese government bonds, the latter driven by the authorities' announcement on the same day that they would increase by 29% the annual amount devoted to outright purchases of such securities. Despite the leeway provided by policy rates that remained higher than those in other major economies (Graph II.9), speculation about the possibility of similar measures being taken by the ECB also affected euro area bond yields. Although these yield declines were quickly reversed, announced purchases at least temporarily countered pressures from growing supplies of government bonds (Graph II.8). Similar "signalling effects" (see Chapter VI) were evident in the markets for US consumer debt-backed securitisations, where support from government programmes had contributed to a tightening of spreads (Graph II.2, right-hand panel), and would later be observed also in Europe, following an announcement in early May that the ECB was to start purchasing euro-denominated covered bonds (Table II.1).

... and improving financial sector news ...

Broader asset markets also recovered, albeit from depressed levels. The announced bond purchases added to the optimism that had taken root earlier in the month following the release, on 10 and 11 March, of favourable performance data from large US banks. In response, both equity and credit markets bounced back from their lows, again driven by the financial sector. Both markets expanded these gains in the following weeks, supported by announcements of additional policy action, investor beliefs that the initiatives launched at the G20 summit in London would help boost the global economy, and robust first quarter earnings at major banks and corporates. With tentative improvements in key macroeconomic indicators providing further impetus, the S&P 500 rose by 29% between 9 March and end-April, with other major indices climbing by similar amounts. Emerging market assets also rose during this period; the gains reflected positive developments in key markets, such as China, and recovering equity prices in emerging Europe, where broad regional indices outperformed those in industrial countries (Graph II.11, centre panel).

... supported financial markets

However, persistent signs of dysfunction remained ...

Yet despite these positive developments, continuing financial sector risks were underlined by persistent signs of market dysfunction. Although repeated central bank injections of liquidity and the provision of government guarantees had helped to calm interbank lending and to lower Libor-OIS spreads, observed levels remained substantially higher than before the start of the crisis in 2007, partly because of considerable lingering uncertainties about the scope and effectiveness of government support (Graph II.4, left-hand panel). Forward rates, in turn, pointed to investor expectations of only limited further improvement in Libor-OIS spreads up to end-2009. Similar concerns prevailed in credit markets. The pricing differential between CDS contracts and corresponding cash market bonds, the so-called CDS-cash basis, had moved

to unusually negative levels in the aftermath of the Lehman bankruptcy. The arbitrage activities that would usually tend to compress the basis require investors to commit both funding and capital; wide price differentials therefore pointed to persistent balance sheet constraints along with large relative liquidity premia across markets (Graph II.3, right-hand panel).[6]

... suggesting that normalisation was bound to be a protracted process

In mid-May, despite further valuation gains across various asset classes in the wake of bank stress tests conducted by the US authorities, market conditions continued to be fragile. Unprecedented policy action had managed to halt the financial crisis, but normalisation was bound to be a protracted process. With a sustained recovery unlikely to take hold without a lasting stabilisation of the financial sector, questions remained about how effective past and future policy measures would be in maintaining the improved tone in markets (see also Chapter VI). Substantial reductions in policy rates and yields reflected aggressive policy action as well as a deteriorating macroeconomic environment (Graphs II.8 and II.9). Major equity markets had fallen to levels some 45% below their October 2007 highs, and valuations, as measured by forecast-based price/earnings ratios, were back to values last seen in the early 1990s (Graph II.7, left- and right-hand panels). Credit spreads, while having come down substantially from their peaks, were still wide by historical standards, reflecting expectations of sharp increases in default rates and associated losses on bond and loan portfolios (Graph II.6, left-hand and centre panels; see also Chapter III). While the cyclical deterioration in credit quality was thus bound to continue, forward CDS spreads suggested that risk premia were expected to revert to more normal levels over the medium term (Graph II.3, centre panel).

[6] Factors commonly driving the CDS-cash basis include funding constraints, counterparty credit risk and relative liquidity conditions. See J De Wit, "Exploring the CDS-bond basis", *National Bank of Belgium Working Papers*, no 104, November 2006.

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.

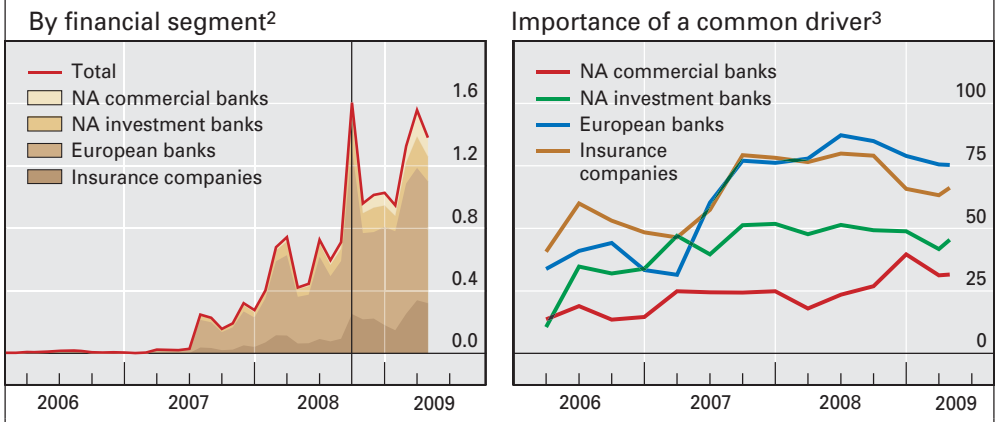
From a longer-term perspective, the crisis carries important messages for the structure and stability of the financial system. The events of the past two years highlighted how strong the interdependencies between financial system components can become. Market participants and also, arguably, prudential 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]



[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.

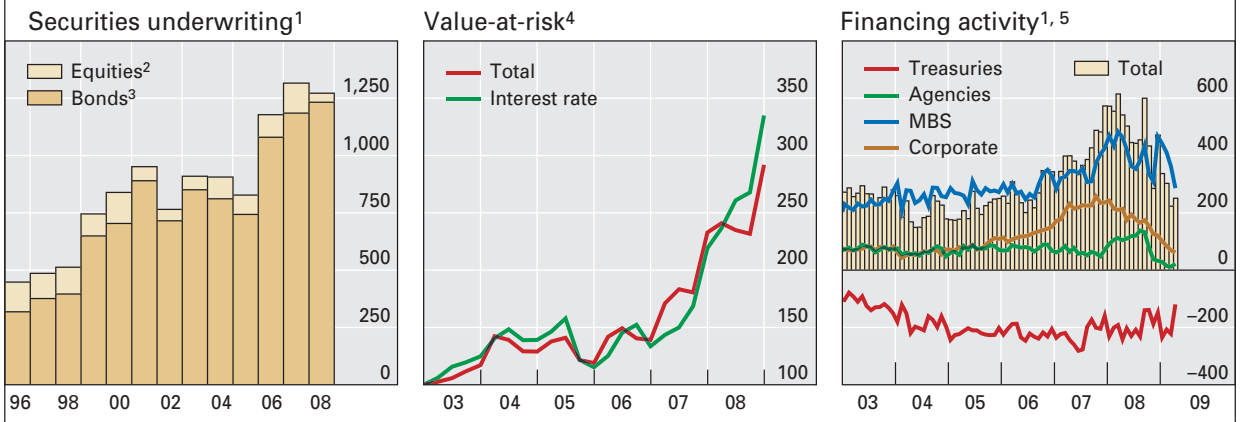
Investment banking

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 ...

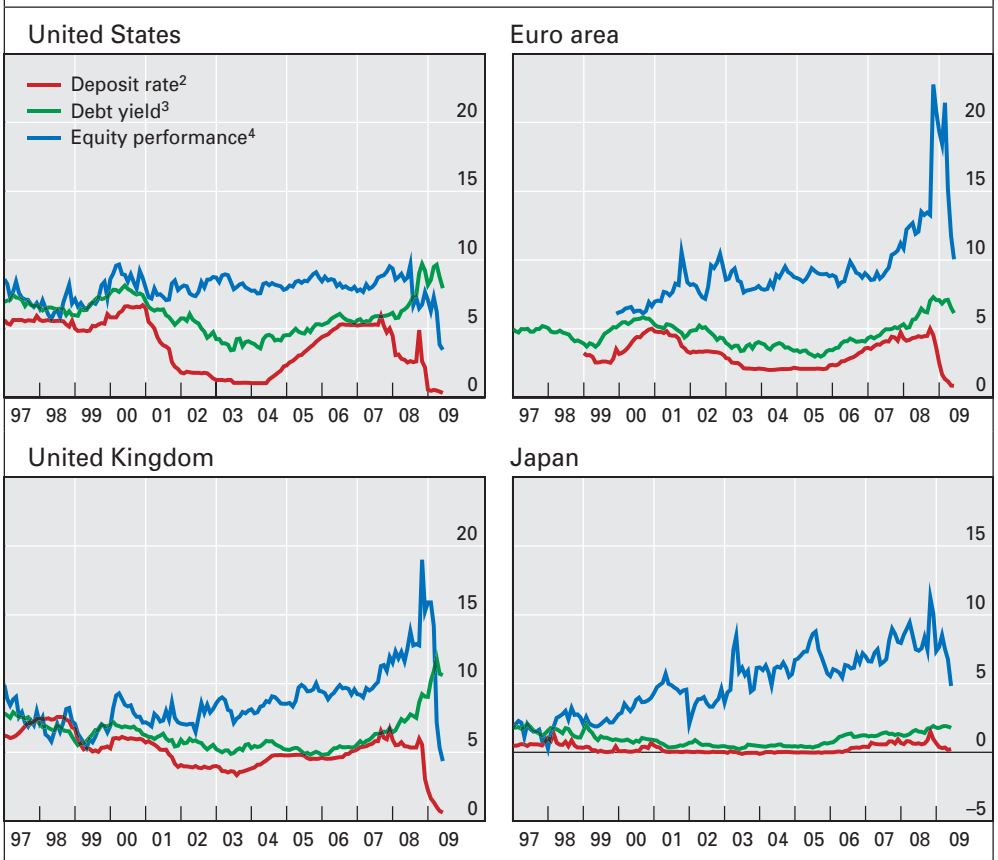
The demise of the standalone investment bank has been a salient feature of the crisis, the second stage of which spanned the period between the March 2008 near collapse of Bear Stearns and the September bankruptcy filing by Lehman Brothers, two of the largest independent firms (see Chapter II). During 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

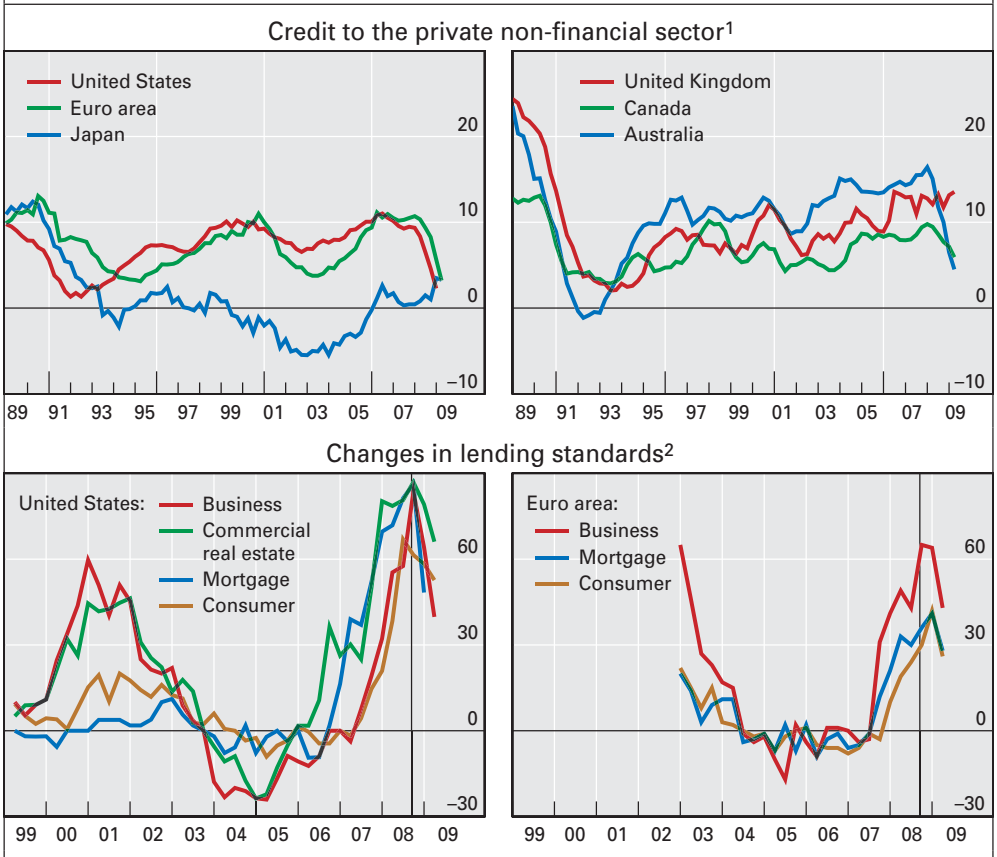
The difficulties banks have faced in maintaining capital buffers that satisfy investors, counterparties and supervisors illustrate that the interaction between the availability of capital and uncertainty about incipient risk can be intensely procyclical. Uncertainty about the path of future revenues 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

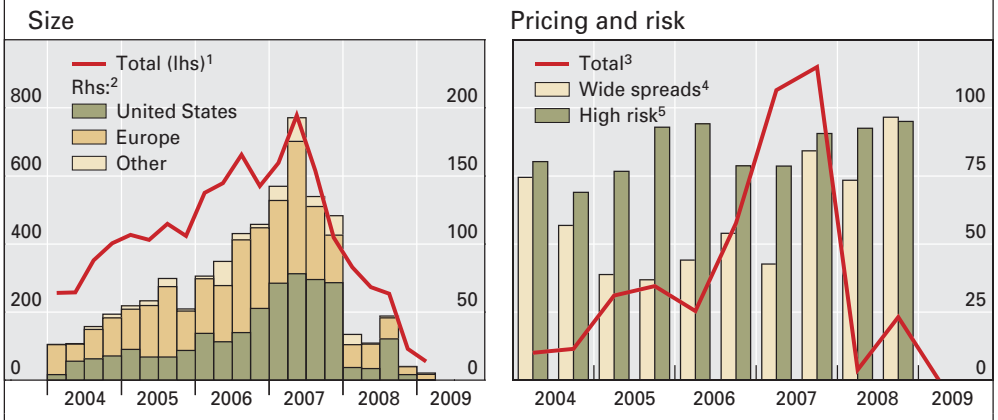
Credit growth and lending standards



[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.

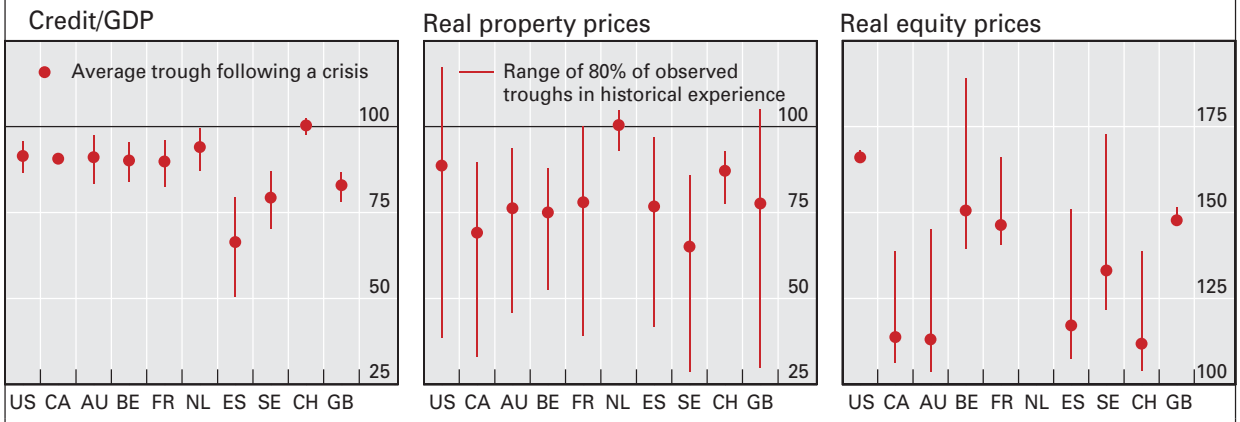
Source: Dealogic Loanware. Graph III.5

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

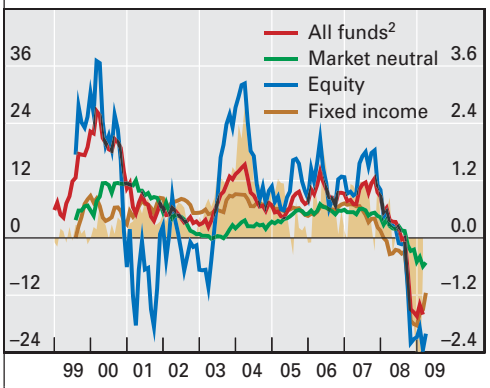
Hedge funds have not played a central role in shaping the dynamics of the crisis, but they have been greatly affected by events. Their asset performance has been hit hard, and their funding conditions have worsened dramatically. As a result, a number of funds have found themselves in serious difficulty.

Bad performance and outflow of capital

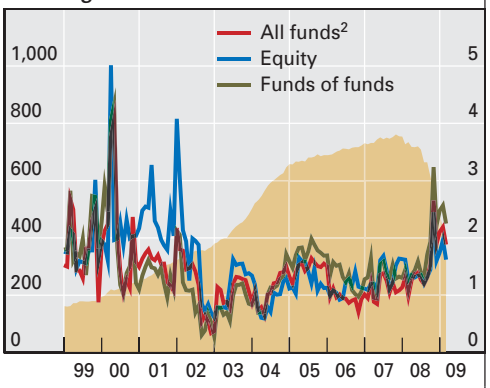
The past year was one of the worst on record for hedge fund performance. Financial results were negative across practically all investment strategies, as well as for funds of funds (Graph III.7), as returns in asset markets plummeted and the cost of funding soared. In addition, the general shortage of 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,

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).

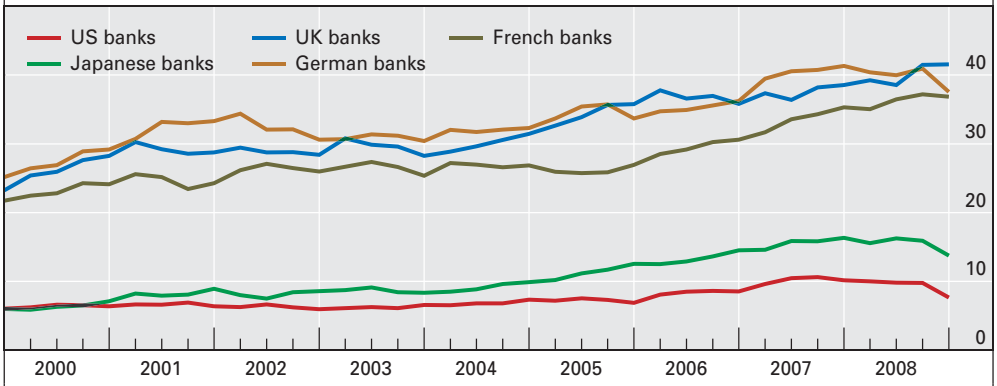
... as banks experienced severe funding pressures ...

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

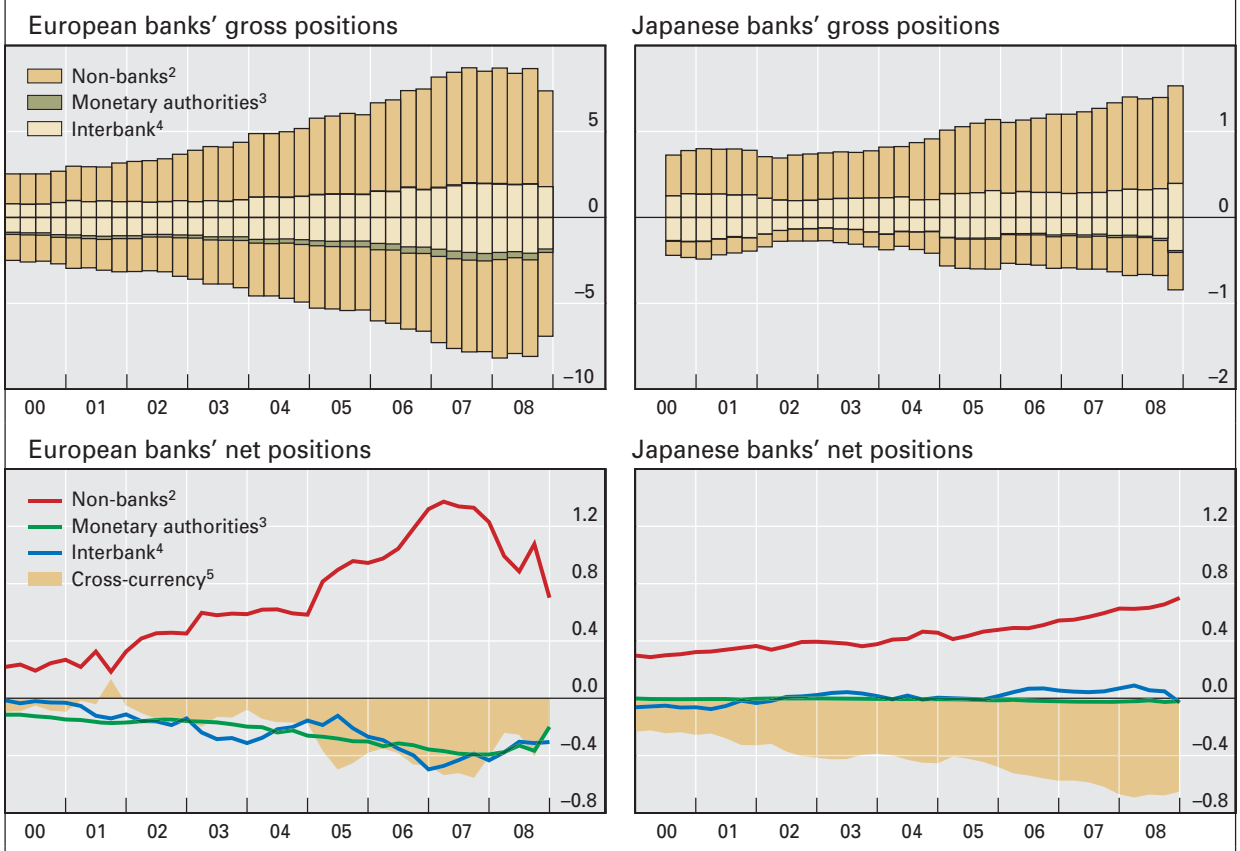


[1] Lending to non-banks residing outside a given country as a share of total lending to non-banks by banks headquartered in that country.

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.

IV. Fallout for the industrial economies

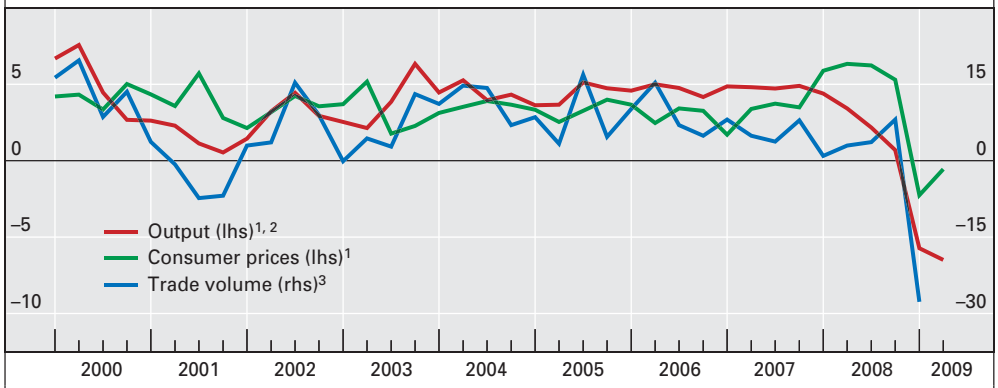
Several industrial economies began to contract in the first half of 2008. In the second half, recessionary forces became much stronger and more global. The resulting plunge in world trade was more rapid than at any time in the past half-century and hit all export-oriented economies hard (Graph IV.1). The coincidence of the end of a long global upswing, a collapse in trade and a severe financial system shock made the downturn an unusually synchronised worldwide phenomenon. With industrial production, exports and confidence becoming highly correlated across economies, global output and inflation declined sharply.

Most leading international forecasters envisage a contraction in global output of 1–2% in 2009. The United States, the euro area and Japan are in a deep recession, and growth in emerging market economies as a whole has slowed abruptly. The consensus forecast as of May is for global growth to recover but to remain well below trend through 2010. As a result, several major economies are expected to see zero or negative year-on-year inflation rates in 2009. The US current account deficit has narrowed in recent months, with a correspondingly large fall in the surpluses of Germany, Japan and countries in the Middle East. The surpluses of China and other emerging economies in Asia remain large.

The short-term outlook is highly uncertain, one reason being the difficulty in assessing the complex interaction between the real economy and the financial system, and the impact of the exceptional policy measures introduced over the past year or so. Recent policy measures should help support demand, ease downward pressures on asset prices and credit flows and lead to a return of

Global output, trade and consumer prices

Annualised quarterly changes, in per cent



[1] Weighted average using 2005 GDP and PPP weights of: the euro area, Japan and the United States; Australia, Canada, Denmark, New Zealand, Norway, Sweden, Switzerland and the United Kingdom; China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand; Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela; the Czech Republic, Hungary and Poland; Russia, Saudi Arabia, South Africa and Turkey. [2] First quarter of 2009 partly estimated using forecasts from JPMorgan Chase. [3] Sum of world exports and imports of goods in US dollars divided by unit values.

Sources: IMF; Bloomberg; Datastream; JPMorgan Chase; national data. Graph IV.1

confidence. But the very speed of the recent downturn could create larger than average second-round effects. In particular, if the propensity to save were to rise further in the industrial economies – as could easily happen, given the high overhang of household debt and dramatic reduction in household wealth – contractionary impulses in the global economy could be prolonged.

Before the crisis

"Global saving glut" prior to the crisis ...

The current crisis was preceded by a major shift in global macroeconomic conditions. A key element of this shift was a significant rise in global gross saving as a percentage of GDP, from about 21½% in 2001 to almost 24½% in 2007. Most of the increase reflected the relatively high saving rate of the emerging market world, where a more than threefold rise in aggregate saving between 2001 and 2007 had lifted the marginal propensity to save to 43%. Average saving rates rose in most emerging market regions, but the trend was particularly marked in China and the Middle East (Table IV.1). In addition, in several emerging Asian economies, investment rates fell from their mid-1990s level, leading to even higher excess saving.

In contrast, the average saving rate of industrial economies fell. The decline was led by a sharp drop in the saving rate, notably in the United States. In some economies (eg Ireland, Spain, the United Kingdom and the United States), the composition of capital spending shifted markedly towards residential construction during the first half of the 2000s.

Global gross saving and investment

As a percentage of GDP

	Saving				Investment			
	1995	2001	2007	2008	1995	2001	2007	2008
Advanced economies	21.4	20.0	19.9	18.8	21.6	20.6	21.0	20.4
United States	16.0	16.4	14.2	11.9	18.6	19.1	18.8	17.5
Japan	30.5	26.9	28.9	26.7	28.4	24.8	24.1	23.5
Germany	21.1	19.5	25.8	25.7	22.2	19.5	18.3	19.3
United Kingdom	15.9	15.4	15.3	15.1	17.2	17.4	18.2	16.8
Other[1]	21.4	22.5	22.5	21.9	20.1	21.2	23.5	23.2
Emerging economies	26.8	26.6	35.4	36.6	27.6	25.1	30.2	31.8
China	42.1	37.6	57.6	59.0	41.9	36.3	46.6	49.0
Other emerging Asia[2]	31.7	27.6	32.8	32.1	32.5	24.2	28.9	30.1
Latin America[3]	17.0	18.0	22.8	22.3	19.2	20.6	22.2	22.8
Middle East[4]	24.0	33.3	49.6	50.8	20.9	24.8	26.5	26.7
Other[5]	22.7	23.0	23.1	24.3	23.1	20.2	23.5	24.3
Total	22.5	21.4	24.3	24.2	22.8	21.5	23.6	23.9

Country groups and total are calculated as the sum of saving or investment in the component countries, divided by the sum of GDP in those countries, all expressed in US dollars.

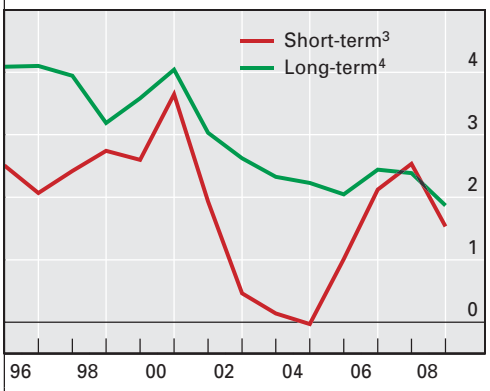
[1] Australia, Canada, Denmark, New Zealand, Norway, Sweden, Switzerland and euro area economies excluding Germany. [2] Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [3] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [4] Iran, Kuwait, Libya, Oman, Qatar, Saudi Arabia and Yemen. [5] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Source: IMF, *World Economic Outlook*. Table IV.1

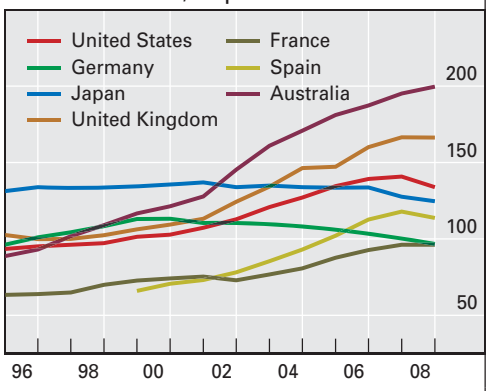
Interest rates and household debt

In per cent

Real interest rates[1] in the G3[2]



Household debt/disposable income[5]



[1] Nominal rates less core inflation (for the United States, change in the deflator for personal consumption expenditures excluding food and energy; for the euro area, change in consumer prices excluding energy and unprocessed food; for Japan, change in consumer prices excluding fresh food). [2] The United States, the euro area (prior to 1999, Germany) and Japan; weighted average based on 2005 GDP and PPP exchange rates; annual averages. [3] Three-month money market rates. [4] Ten-year government bond yields. [5] Definition of households may differ across countries; household disposable income in net terms except for Spain and the United Kingdom (gross).

Source: National data. Graph IV.2

... contributed to major imbalances in international demand patterns ...

One effect of this pattern of spending was the concentration of consumption growth in only a few countries: the United States, in particular, contributed about one third of the increase in global consumption between 2000 and 2006. Another major consequence was the rise in the US current account deficit from a little over 3% of GDP at the end of the 1990s to a peak of 6% in 2006. By 2007, current account surpluses as a percentage of GDP had soared in countries that were major exporters of manufactured goods – in China to more than 10% of GDP; in Germany to almost 8%; and in Japan to about 5%. Current account surpluses in the Middle East were boosted by higher oil prices.

... by depressing long-term interest rates

The pre-crisis household spending boom in many advanced economies was sustained by several interrelated factors. One was a significant decline in real long-term interest rates, made possible not only by the strong rise in global saving but also by a reduction in the term premium led by increased demand for long-term securities by institutional investors, particularly emerging market central banks (Graph IV.2).[1] The expansionary impact of low long-term interest rates was magnified by easy monetary conditions in major advanced economies, where real short-term interest rates remained low or negative between 2002 and 2005.

[1] There are a number of theories on the link between global saving and long-term interest rates. According to the "saving glut" hypothesis, the real long-term interest rate must fall to establish the global equilibrium at a higher level of investment; see B Bernanke, "The global saving glut and the US current account deficit", Homer Jones Lecture, St Louis, 14 April 2005, www.federalreserve.gov. Yet another hypothesis is that financial crises and high saving in emerging markets, combined with limited financial development, created a global shortage of low-risk assets, leading to lower long-term bond rates; see R Caballero, E Farhi and P Gourinchas, "An equilibrium model of 'global imbalances' and low interest rates", *American Economic Review*, vol 98, no 1, March 2008, pp 358–93.

Household debt rose sharply ...

During the upswing, credit conditions eased the most in the United States: real long-term rates on 30-year fixed rate mortgages fell from about 5% in the early 2000s to 1–3% in 2005, and non-price lending terms were eased considerably (see Chapter III). A near doubling of real household credit growth, from an average of 4% in the 1990s to about 7.5% during 2000–06, led to a substantial build-up of household debt relative to income. Household indebtedness also increased significantly in the United Kingdom, where mortgage rates, linked to short-term interest rates, also fell sharply. Greater household leverage thus made many households highly vulnerable to negative income and asset price shocks.

... as did house prices ...

A second factor in the spending boom, partly driven by the first, was a surge in house prices in several countries. Not only did this lead to increased speculative buying of property, but it also facilitated higher borrowing against housing collateral. From the early 2000s to the peak of the housing price cycle, real house prices increased more than 90% in the United Kingdom and Spain and more than 60% in the United States (based on the Case-Shiller home price index). In several countries, the share of residential investment in GDP rose sharply above trend. In the United States, this share reached a peak of 6.2% in 2005 and the homeowner vacancy rate jumped by 50% between 2001 and 2006, to over 2.5%. Residential construction rose well above trend in Spain and Ireland (to 9% and 12% of GDP, respectively, in 2007) as well as in Australia and Canada.

... residential investment ...

... and investment in consumer durables sectors

A third factor was that the spending boom in several industrial economies may have generated excessive optimism among producers of goods and services, leading to overinvestment and a significant misallocation of resources during the pre-crisis period. In particular, a marked rise in household spending on consumer durable goods, including cars, led to a build-up of production capacity. In the United States, for instance, expenditure on consumer durables, which had picked up since the mid-1990s, accelerated during the early 2000s, with its ratio to GDP rising from about 7% in the mid-1990s to a peak of about 11% in 2007.[2] In the US automobile sector, production capacity increased by about 55% between 1996 and 2006 compared with growth of less than 25% during the preceding 10 years.

From boom to bust

The boom ended in a sharp and synchronised global downturn ...

Since the second half of 2008, household expenditure (including on houses) in the advanced world has contracted as asset prices and confidence have fallen sharply and as credit market conditions have tightened. The following section focuses on the dynamics of the current downturn in advanced economies and the factors behind it, while Chapter V provides a discussion of how the downturn has affected emerging market economies.

Although growth has weakened considerably in the United States since mid-2007 and in other major industrial economies since early 2008, the

[2] Spending on consumer durables also has an investment element. Including this element in tangible assets raised the US household saving ratio by 2.5 percentage points during 2000–06; the increment fell to 0.5 percentage points by the final quarter of 2008.

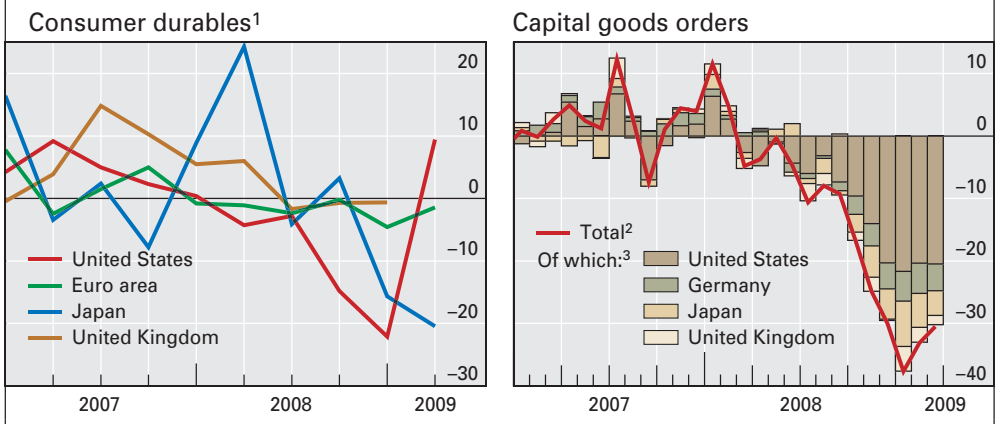
downturn became truly global only towards the end of 2008 (see Table I.1 for an overview of the stages of the crisis). Output fell at seasonally adjusted annual rates of 14% in Japan and over 6% in the United States and the euro area in the fourth quarter of 2008, followed by even larger declines in the first quarter of 2009 in Japan and the euro area (15% and about 10%, respectively). However, there have been some signs that the pace of decline in output has started to ease since March. The monthly rate of decline in industrial production slowed in the United States in April and production increased in Japan in March and April. In addition, most survey measures of manufacturing output (eg purchasing managers' indices) continued to improve in the G3 economies up to May, suggesting that the outlook for a recovery has strengthened.

... led by a rapid contraction in durables consumption ...

The downturn has been unusually deep, involving most components of spending. Private consumption contracted in all major economies in the final quarter of 2008, but nowhere as quickly as in the United States, where it plunged by an annualised 4.3%, accounting for almost half of the decline in output. The hardest hit category was spending on consumer durables, which slumped during the second half of 2008 (Graph IV.3). By the fourth quarter, the share of consumer durables expenditure in US GDP had already fallen by about 1 percentage point from its peak in 2007. The outsize fall was followed by a rebound in the first quarter of 2009, but its sustainability, in the face of large wealth losses and credit market disruption, remains uncertain (see the next section). In contrast, consumption accounted for only a small part of the drop in output in the euro area and Japan; the downturn in these economies was led instead by a major collapse of net trade, accounting for about 75% and 50% of the decline in output in Japan in the fourth quarter of 2008 and the first quarter of 2009, respectively, and for about 60% of the decline in the euro area in the final quarter of 2008.

With consumption deteriorating faster than income, household saving rates increased in several advanced economies, particularly in those where

Change in real spending



[1] Including semi-durables; for the euro area, proxied by retail sales excluding food; quarterly changes at annual rates, in per cent. [2] Weighted average based on 2005 GDP and PPP exchange rates; changes over 12 months, in per cent. [3] Contributions, in percentage points.

Source: National data. Graph IV.3

they had been low. The United States recorded a sharp rise of almost 4 percentage points of disposable income (to 4.2%) between the last quarter of 2007 and the first quarter of 2009. Australia and the United Kingdom also saw a jump in household saving, from almost zero and a negative saving rate in the first quarter of 2008 to 8.5% and 4.8%, respectively, in the fourth quarter. The propensity to save of euro area households also increased markedly, with the saving rate rising by 1 percentage point (to 15.1%) in the final quarter of 2008.

... a sharp decline in residential investment ...

The decrease in residential investment was most rapid in the United States, where residential construction declined to a low of 2.7% of GDP in the first quarter of 2009. In Spain and the United Kingdom, the crisis further impaired an already weakened residential sector. Residential investment also started to fall in Germany towards the end of 2008, and housing starts suggest that a major housing downturn has been under way in Japan since the beginning of 2009. At the end of 2008, the ratio of residential investment to GDP still exceeded the average since 1980 in a number of industrial economies (notably Canada, Ireland and the Netherlands), suggesting that the adjustment has further to go in many cases.

... and a deep downturn in business investment

A squeeze in credit supply to commercial real estate developers, combined with low demand for office and commercial properties, accentuated the weakness in non-residential construction. Moreover, as consumer demand prospects deteriorated and overseas orders plummeted, business investment projects were either postponed or cut heavily. In the United States, for instance, non-residential fixed investment contracted by a record 38% (annualised) in the first quarter of 2009 following a 23% fall in the fourth quarter of 2008. Business investment also contracted sharply in Japan and the euro area. The steep decline in capital goods orders up to March 2009 suggests that the investment downturn remains deep (Graph IV.3).

The recession was aggravated by pressure to curb excessive inventories as actual sales fell more rapidly than expected. In addition, there is evidence that investment may have suffered because of shortages of trade credit. Surveys in the United Kingdom, for instance, suggest that interfirm trade credit suffered as payment delays increased, as the probability of business failures rose, and as firms accumulated cash to reduce exposure to volatile markets. The greater reluctance of banks and non-bank financial institutions to discount trade invoices could also have contributed to the investment downturn.

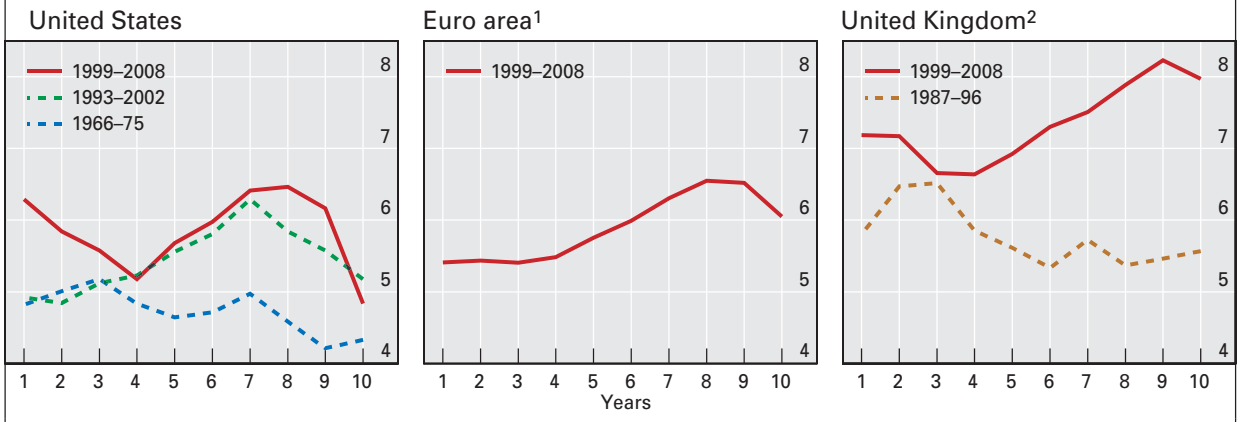
The downturn, balance sheets and credit

Household balance sheets

Very weak household balance sheets ...

A key factor leading the downturn was the severe weakening of household balance sheets as a result of the financial crisis. Equity prices fell rapidly, and the decline in nominal house prices, which had first been confined to the United States, became more widespread across advanced economies. From the second quarter of 2007 to the fourth quarter of 2008, US households lost around 20% (about $13 trillion) of their net worth; as a percentage of

Household net wealth as a ratio of disposable income



[1] Estimates of 2008 net wealth based on changes in net worth (excluding revaluation of residential property). [2] Estimates of 2008 net wealth based on changes in net worth due to gross saving and capital transfers.

Sources: ECB; Federal Reserve flow of funds accounts; Datastream; UK Office for National Statistics; national data. Graph IV.4

disposable income, this loss was greater than the wealth accumulated over the previous five years (Graph IV.4). Wealth losses in the euro area have also become more widespread across assets and countries, far exceeding those suffered during the equity market meltdown in 2001, when rising housing wealth offset the negative effects of large equity losses.

... are having negative effects on consumption ...

Such declines in household wealth, particularly housing assets, are likely to constrain consumption for some time, although there could be forces working in the opposite direction. Falling house prices imply a reduction in the implicit rental cost of housing, offsetting some of the negative wealth effects. Moreover, lower prices make houses more affordable for prospective homeowners, reducing their need to save for a given down payment. In addition, some decline in household wealth – particularly from depreciating financial assets – may be perceived as temporary.

... particularly by reducing the value of collateral

Although researchers disagree on the estimates of the wealth effect on consumption, the impact of housing wealth is generally assumed to be significant – ranging in several studies between 3 and 7 cents per dollar in Australia, Canada, the United States and the United Kingdom. It is assumed to be relatively small for the euro area.[3] The decline in homeowner equity is likely to cause particularly large reductions in spending among households that had borrowed against housing equity to finance consumption. The fact that loose credit standards in some countries had made borrowing against collateral considerably easier during the upswing could lead to a strong negative effect as standards are tightened. It is possible that asset price declines that leave many households with large negative equity generate asymmetric wealth effects on consumption.

In addition, increased financial vulnerability stemming from such a large loss of wealth may lead households to shift away from less liquid assets

[3] See the recent review of estimates of wealth effects on consumption in European Central Bank, "Housing wealth and private consumption in the euro area", *ECB Monthly Bulletin*, January 2009.

In addition, households may invest less in durable assets ...

(houses mainly, but also durable goods) towards more liquid, financial assets. In particular, highly indebted households with substantial contractual debt obligations may increase their financial saving and reduce spending on housing, cars and other high-value consumer durables.[4]

... and increase their saving for retirement

Furthermore, the steep decline in the value of pension fund assets may force individuals nearing retirement who have defined contribution pension schemes – in which benefits are linked to the market value of assets – to increase saving or defer retirement. In the case of defined benefit plans, the large funding gaps could harm the financial position of the corporations sponsoring them and reduce their ability to provide guaranteed benefits or maintain existing employment.

But the impact is likely to vary across economies

That said, the impact of the wealth contraction is likely to vary across countries depending on institutional arrangements. Equity extraction from housing wealth was significant in Australia, Canada, the United Kingdom and the United States during the upswing, so household spending is likely to be more affected in these countries than in others. Some estimates suggest that, in the United States, about 1¾% of consumption annually was financed through home equity withdrawals during 2001–05, or 3% if withdrawals used to repay non-mortgage debts are included.[5] In the United Kingdom, home equity withdrawal has reversed, plummeting from over 7% of post-tax income in 2003 to –1% in 2008. By contrast, equity extraction played a relatively minor role in household spending in the euro area as a whole because of both a low home ownership ratio and, in some countries, a less developed mortgage market.

A key risk is a further sharp rise in household saving

Nevertheless, the fact that household debts increased so much in so many countries suggests that large wealth and income losses are likely to raise the saving rate still further in much of the advanced world. How protracted this rise might prove to be remains uncertain. In the 1970s US recession, the household saving rate went from a low of 8.0% in mid-1972 to a peak of 12.5% in mid-1975. A similar trough-to-peak rise in the saving rate was observed in the early 1980s US recession. In contrast, the 1990s and early 2000s recessions had little impact on the saving rate. The rate of household saving in the current US recession was, however, much lower at its lowest point than in previous recessions, and household indebtedness much higher at its peak. The increase in saving could thus be stronger and more protracted than in the past. Household saving rates could also rise further in Australia and the United Kingdom as well as in several euro area economies (eg Ireland, the Netherlands and Spain), where they are still below their historical averages.

Corporate balance sheets

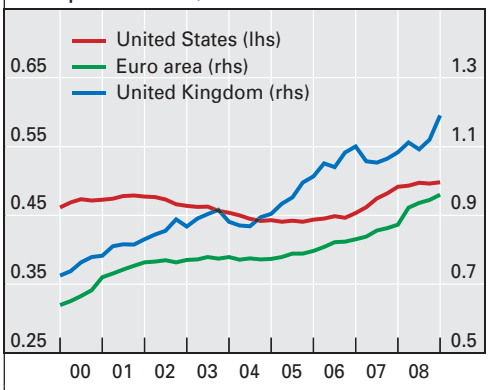
Unlike in the household sector, debt levels in the non-financial corporate sector remained fairly stable or even fell during the first half of the 2000s.

[4] This factor appears to have played an important role in the rise of US household saving following the 1970s stock market downturn; see F Mishkin, "What depressed the consumer? The household balance sheet and the 1973–75 recession", *Brookings Papers on Economic Activity*, vol 8, no 1, 1977, pp 123–74.

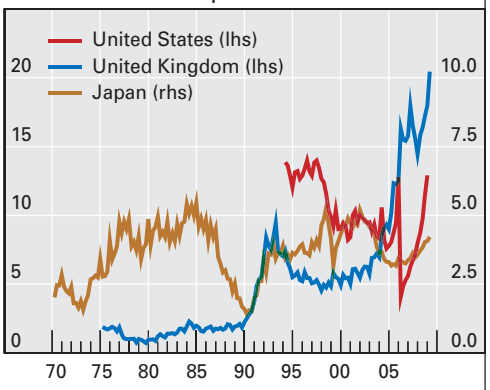
[5] See A Greenspan and J Kennedy, "Sources and uses of equity extracted from homes", *Finance and Economics Discussion Series*, 2007-20, Board of Governors of the Federal Reserve System, March 2007.

Indicators of corporate vulnerability

Corporate debt/GDP ratio[1]



Number of bankruptcies[2]



[1] Loans and debt securities liabilities of non-financial corporations. [2] In thousands; for the United States, business bankruptcy filings; for the United Kingdom, bankruptcy orders; for Japan, business failures.

Sources: Datastream; national data. Graph IV.5

Between 2005 and 2008, however, corporate debt levels as a percentage of GDP rose considerably (Graph IV.5). The crisis further weakened balance sheets by sharply reducing profitability as well as the value of corporate investments. In addition, widening credit spreads cut the access of many firms to capital markets, leading to major funding problems.

Corporate balance sheets have also weakened ...

During 2008, US non-financial non-farm corporations suffered an aggregate decline in net worth of 7%; this was led by a sharp decrease in the value of their real estate assets (down 12.8%) and a somewhat smaller decline in their financial net worth (down 5.3%). In contrast, net financial worth (excluding equity) of euro area and Japanese non-financial corporate firms deteriorated much more rapidly, falling by about 50% in 2008. Corporate sector distress has risen to very high levels, with the number of corporate bankruptcies approaching or exceeding historical peaks in many industrial economies (Graph IV.5).

... in all major industrial economies ...

The weakening of corporate financial positions and profitability seems likely to reduce business investment, with feedback effects on the economy and balance sheets. The severity of such negative financial accelerator effects depends on the structure and the initial strength of corporate balance sheets. In the euro area and the United Kingdom, outstanding gross corporate financial liabilities (including debts, trade credits and other liabilities) were about 130% of GDP at the end of 2008. That level, which is well above the 1990s average, represents a heightened vulnerability to adverse financial shocks. Although US corporate financial liabilities have also risen, reaching 90% of GDP by the end of 2008, they do not seem to be excessive relative to the 1990s average.

... raising the likelihood of further cuts in investment

The downturn in the credit cycle

The crisis has provoked a sharp turn in the credit cycle. Sizeable policy rate cuts have helped bring down interest rates on funds borrowed by households and businesses over the past year. But the impact of interest rate reductions

Moreover, tighter lending standards are reducing credit availability ...

on credit flows has been muted by a sharp tightening of non-price lending standards by banks (see Chapter III).

... particularly to households, but increasingly to businesses ...

Aggregate private credit growth in many advanced economies fell over the past year or so, most dramatically in residential credit markets. Nominal housing credit (excluding home equity loans) contracted at an annual rate of 1–2% from the second quarter of 2008 to the first quarter of 2009 in the United States, and it stopped growing in the euro area by March 2009. Consumer credit slowed significantly in many advanced countries, the exception being the United States, where it grew at an annual rate of 9% in the first quarter of 2009. Although business credit continued to expand in many countries, it was probably driven by an increase in the use of existing credit lines rather than by new lending.

... reinforcing spending cuts

While the credit squeeze has been holding back potential first-time home buyers and other credit-constrained consumers, declines in income appear to have made more households credit-constrained. The disappearance of alternative financing offered in the past by non-bank lenders has tended to magnify such effects. Business investment has also suffered – recent lending surveys report significant cuts in new credit lines to firms, particularly in the United States. In addition, with growth weakening and balance sheet positions deteriorating rapidly, the credit downturn is being exacerbated by a substantial reduction in credit demand as firms scale back investment plans and households reassess their income and wealth prospects.

The depth of the credit downturn is highly uncertain

The depth and duration of the credit downturn will thus depend on how banking system deleveraging (see Chapter III) interacts with balance sheet adjustments by firms and households. While such interaction is hard to predict, past credit and financial crises can provide some guidance.

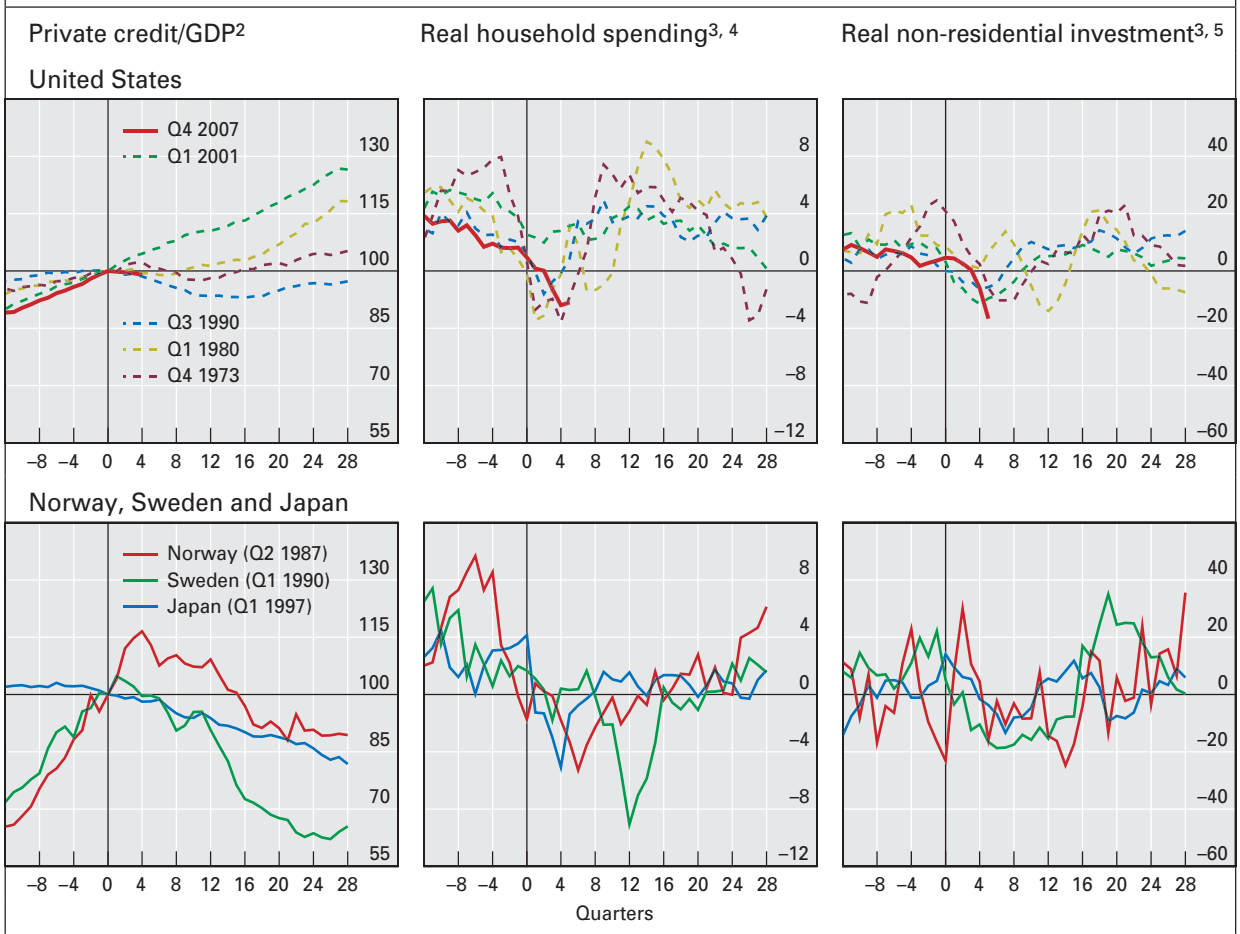
Past US cycles suggest a prolonged impact on credit and spending ...

It is useful to compare the current US credit cycle with previous US cycles, even though their proximate causes are different. In particular, the early 1990s credit market downturn provides an interesting benchmark (Graph IV.6). Even though losses from the reduced value of commercial property were modest, real private credit fell for 14 consecutive quarters beginning in the third quarter of 1990. The ratio of credit to GDP also contracted during this period. The close link between the credit and household spending cycles was notable, although the credit contraction ultimately proved to be more protracted than declines in household spending. In addition, non-residential investment weakened considerably in the 1990s downturn.

... as in the Nordic banking crises ...

Another useful point of reference is provided by the 1990s Nordic banking crises, in which the booms and busts of real estate prices also played a key role. The Nordic crises precipitated a contraction in the credit/GDP ratio in the region that lasted five to seven years and were followed by a protracted decline in spending. In Norway and Sweden, household spending and business investment both weakened well before the peak in the output cycle and contracted for several years following the crises. Even so, as discussed in Chapter VI, differences in crisis resolution regimes also matter. By the time authorities intervened in the Nordic crises, credit and economic activity had already deteriorated significantly. By contrast, the authorities have intervened

Credit and spending over selected business cycles[1]



[1] Period zero and dates in the panel legends refer to the peak of the output cycle; for the United States, peak dates are from the National Bureau of Economic Research (NBER). [2] Domestic credit to the private sector as a percentage of GDP, rebased on the peak of the business cycle. [3] Annual changes, in per cent. [4] Real private consumption plus real private residential investment. [5] Total real private fixed investment minus real private residential investment.

Sources: IMF; OECD; national data. Graph IV.6

at an early stage of the credit and business cycle in the current crisis in order to cushion the downturn.

... and the Japanese banking crisis

Of relevance to current problems in the household sector is Japan's experience in the 1990s, which illustrates the adverse interaction between a banking crisis and a large overhang of debt in the corporate sector. The collapse of asset prices in Japan in the late 1980s increased bank losses and severely weakened the balance sheets of non-financial corporations, which had debt levels exceeding 150% of GDP in 1990. This led to a protracted period of debt reduction, cuts in capital spending and weak demand for credit. With the corporate sector debt/GDP ratio falling sharply in subsequent years, the credit/GDP ratio also contracted.

Factors accentuating and propagating the recession

Sharp falls in employment are aggravating the downturn ...

Balance sheet and credit market adjustments have an enduring effect on the economy, but their short-run impact in the current crisis has been aggravated by several cyclical factors. One is the slump in employment triggered by

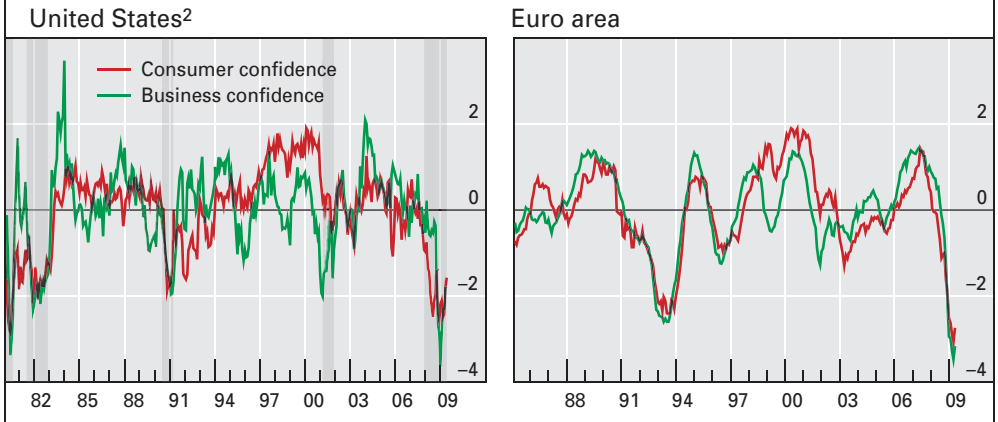
the growing threat of business bankruptcies, which has greatly added to households' financial uncertainty. In the United States, for instance, total hours worked were cut at an annualised pace of 9% in the first quarter of 2009 following an equally large cut in the preceding quarter, lifting the unemployment rate to 9.4% by May 2009. While the current US employment cycle has already proved to be quite deep by historical standards, according to May consensus forecasts the US unemployment rate is expected to be approaching 10% by 2010. In the euro area, sustained growth in the labour supply, coupled with weak demand for labour, was behind the steady increase in the unemployment rate, which reached 9.2% by April 2009.

Employment uncertainties facing euro area households could last longer than in the United States, where the employment cycle tends to be shorter. In the 1980s and 1990s downturns, for instance, employment fell for 12 and eight quarters, respectively, in the euro area compared with about four quarters in the United States. Employment in Japan has continued to be weak since the late 1990s. A marked decline in the ratio of job offers to applicants since the beginning of 2009 suggests that the employment downturn in Japan is likely to deepen further.

... as is fragile confidence ...

A second, and related, cyclical factor is the sharp weakening of consumer and business confidence (Graph IV.7). In the past, confidence tended to explain a small part of spending, after controlling for other major determinants of consumption such as income, wealth and interest rates.[6] However, if weaker confidence reflects expectations of lower future income, it may foreshadow a downward shift in future spending. A key risk is that weak confidence becomes self-fulfilling by reducing spending and employment and increasing income uncertainty.

Confidence indicators[1]

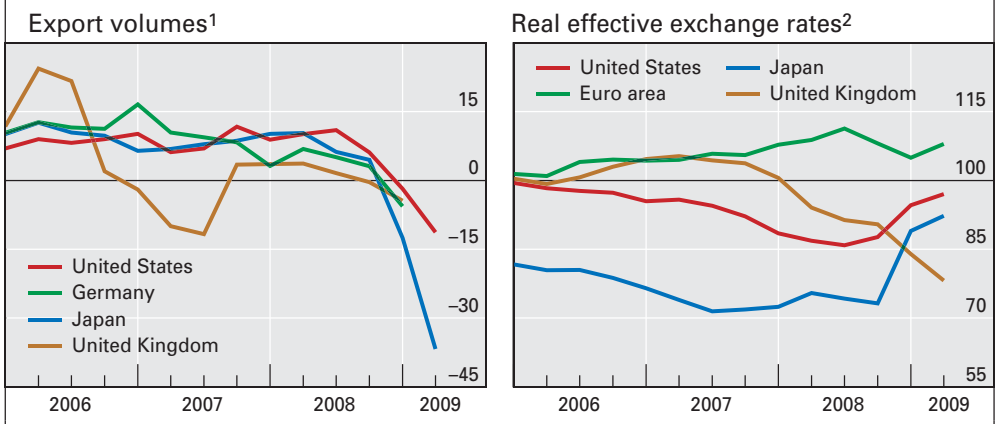


[1] Normalised data, measured as the difference between the indicator and its average (since 1980 for the United States, since 1985 for the euro area), expressed in points of standard deviation. [2] Shaded areas refer to periods of recession dated by the NBER.

Sources: Datastream; national data. Graph IV.7

[6] For recent evidence, see A Al-Eyd, R Barrell and P Davis, "Consumer confidence indices and short-term forecasting of consumption", *The Manchester School*, vol 77, no 1, January 2009, pp 96–111.

Exports and exchange rates



[1] Annual changes for real exports of goods and services, in per cent. [2] BIS broad index, 1994–2005 = 100; quarterly averages.

Sources: National data; BIS. Graph IV.8

A third cyclical factor is the sharp decline in international trade (Graph IV.8), which has contributed to the spreading and deepening of the downturn across economies. The worldwide collapse of manufacturing demand has affected all advanced countries, but those heavily dependent on manufacturing exports, especially Germany and Japan, have been hit the hardest. Moreover, as Germany is the major hub of the European production network, its loss of export business has been felt beyond its borders. Australia and Canada have been affected by a fall in commodity prices, although the negative impact in Australia has been muted not only because the country is a net importer of oil but also because the fall in agricultural prices has been relatively modest.

... along with falling trade volumes

A fourth factor is changes in exchange rates. In particular, a sharp appreciation of the real effective value of the yen since late 2008 has depressed Japan's exports. In contrast, the tradables sector in the United Kingdom has benefited from a substantial reduction in the effective value of sterling. A real depreciation of the euro also helped euro area exports in 2008, but the exchange rate reverted to its appreciation path in the first quarter of 2009. In the United States, however, the dollar's appreciation during the second half of 2008 and the first quarter of 2009 has meant that the exchange rate, on balance, has become more neutral in the evolution of trade over the past year.

Inflation developments in industrial economies

Headline inflation has fallen rapidly in recent months ...

The downturn has led to a sharp decline in inflation pressures in industrial economies. Not only have year-on-year headline inflation rates fallen rapidly since mid-2008 (Graph IV.9), but by the first quarter of 2009 they became negative in the United States and Japan and fell to zero in the euro area by May. Although an assessment of inflation prospects is complex under current conditions, recent disinflation has raised concerns among many observers about risks of deflation in the short run.

... led by the slump in commodity prices ...

Two major factors are responsible for current disinflation pressures. One is the 55% decline in oil prices between mid-2008 and May 2009, which has led to a marked reduction in import prices in many oil-importing countries. In addition, forecasts of global oil demand for 2009 have been revised downwards. In May 2009, the International Energy Agency expected a decrease in world oil demand of 2.6 million barrels per day in 2009 compared with 2008, the sharpest single-year fall since 1981. Metal prices, which started to decline in 2007, dropped more sharply in the second half of 2008 and in early 2009. Food prices have also fallen, although not as dramatically as oil prices because of their relatively weak link to global growth. Softening demand has also resulted in substantially lower shipping rates.

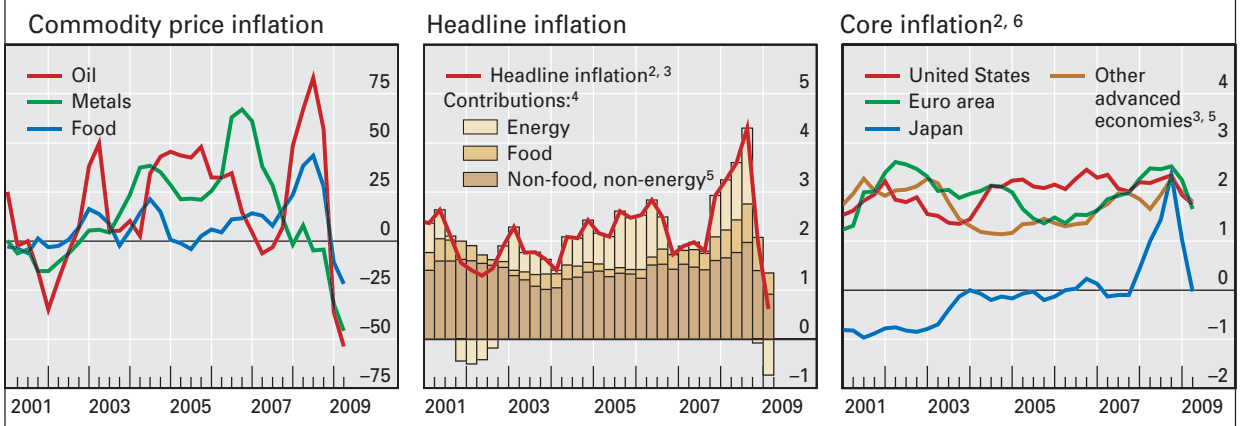
... and considerable economic slack

The second factor is that downward pressures on prices have been accentuated by considerable economic slack. Capacity utilisation in manufacturing has fallen particularly heavily in the major advanced economies. Notwithstanding the substantial uncertainties involved, the projected output and unemployment gaps suggest that the level of economic slack is expected to remain high in 2009 and 2010. Core inflation has declined sharply in Japan since the beginning of 2009, although it remained relatively more stable in the United States and the euro area up to April 2009 (Graph IV.9). There is a risk that the unusually synchronised downturn, combined with a possible jump in household saving, could well aggravate disinflation pressures over the next year or so.

Prospects for inflation are uncertain

Yet there is considerable uncertainty regarding inflation prospects. First, the timing and extent of the impact on spending of recent stimulus measures remain unclear. Developments since the beginning of 2009 have somewhat reduced downside risks to growth forecasts. In addition, there is no reliable estimate of the macroeconomic impact of the large-scale, unconventional monetary policies recently introduced by central banks.

Inflation in commodity and consumer prices[1]



[1] Changes over four quarters, in per cent unless otherwise stated. [2] In selected advanced economies: Australia, Canada, Denmark, the euro area, Japan, New Zealand, Norway, Sweden, Switzerland, the United Kingdom and the United States. [3] Weighted average of CPI changes using 2005 GDP and PPP weights. [4] In percentage points. [5] Headline inflation excluding food and energy. [6] For the United States, change in the deflator for personal consumption expenditures excluding food and energy; for the euro area, change in consumer prices excluding energy and unprocessed food; for Japan, change in consumer prices excluding fresh food.

Sources: IMF; OECD; Datastream; national data; BIS calculations. Graph IV.9

The impact of the current crisis on potential output

Estimates of potential output and the output gap help monetary authorities gauge the current state of the economy. Potential output is usually defined as the maximum level of output that an economy can achieve without causing inflationary pressure, and is largely determined by supply side factors, including technological progress, demographic trends and institutional arrangements in labour and financial markets. Yet potential output is unobservable and thus has to be estimated. Even in normal times, uncertainties surrounding potential output estimates can be considerable because changes in structural factors might be hard to detect. In addition, frequent and sometimes substantial revisions of data on GDP and its major components diminish the usefulness of potential output estimates for real-time policymaking. For example, mean absolute revisions to US GDP growth have tended to be large, ranging from 0.5 (first annual revision) to 1.3 percentage points (third). Around cyclical turning points, mean absolute revisions are substantially larger, often well over 2 percentage points.

A key question in the current conjuncture is to what extent potential output might be affected by the ongoing financial crisis. Several factors are likely to have an impact on the level of potential output, its growth rate, or both. First, the crisis could lead to a severe disruption of the credit intermediation process for years to come, reducing credit availability and increasing risk premia. Second, potential output could be adversely affected by a possible rise in structural unemployment. The protracted nature of the current crisis implies that a non-negligible proportion of workers could permanently drop out of the effective labour force. The natural rate of unemployment could therefore be markedly higher in some countries following the global recession, as many jobs might have vanished forever in industries such as automobile manufacturing and financial services. In the United States, "permanent" layoffs (of workers not expected to ever regain the same job) rose to a record 52.9% of the unemployed in May 2009.

Third, the financial crisis could have a negative impact on total factor productivity by sharply reducing funding for research and development activities. In Japan, for instance, a fall in the growth rate of total factor productivity and a drop in average hours worked per week from 44 to 40 between 1988 and 1993 were found to have led to a change in the slope and level of the steady state growth path (Hayashi and Prescott (2002)). Fourth, the global nature of the current downturn and the high degree of global economic integration could magnify the impact of the crisis on potential output. Given the significant increase in cross-border lending and investment in the past decade, a financial crisis in one country or region could result in large negative effects on other economies. If factors of production are not perfectly mobile, a loss of export markets in some countries could, for instance, render a significant part of their capital stock and labour force idle for an extended period of time, leading to a decline in potential output.

Evidence based on past crises provides some illustrative guidance about the likely effects of the current episode on potential output. In a panel study of output behaviour in 190 countries, Cerra and Saxena (2008) found large and persistent actual output losses associated with financial crises, with output falling by 7.5% relative to trend over a period of 10 years in the event of a banking crisis. Based on the same methodology and using data for 30 OECD economies from 1960 to 2007, Furceri and Mourougane (2009) found that, on average, a financial crisis could lower potential output by between 1.5% (OECD production function-based measures) and 2.1% (measures based on the Hodrick-Prescott filter) within five years. More severe crises (Spain in 1977, Norway in 1987, Finland and Sweden in 1991, and Japan in 1992) were estimated to have a far greater negative impact on potential output (3.8%).

Empirical studies also indicate significant negative impact of financial crises on the growth rate of potential output. Haugh et al (2009), for instance, examined six major banking crises (Spain in 1982, the United States in the 1980s, Finland, Norway and Sweden in 1991, and Japan in 1997). They found that actual output losses were much greater in downturns associated with a major banking crisis. Compared with the preceding five-year period, they found that the growth of potential output in the five years after the onset of a banking crisis was reduced by 0.9, 0.5, 0.4 and 0.3 percentage points in Norway, Finland, Japan and Sweden, respectively.

To a large extent, the impact of the current crisis on potential output will depend on how soon and how effectively government policy measures succeed in restoring credit market intermediation while minimising any distortionary effects they may generate. Steps designed to safeguard labour market flexibility and to boost long-term productivity growth could also play a significant role in supporting potential output.

References

Cerra, V and S Saxena (2008): "Growth dynamics: the myth of economic recovery", *American Economic Review*, vol 98, no 1, March, pp 439–57.

Furceri, D and A Mourougane (2009): "The effect of financial crises on potential output: new empirical evidence from OECD countries", OECD, *Economics Department Working Papers*, no 699, May.

Haugh, D, P Ollivaud and D Turner (2009): "The macroeconomic consequences of banking crises in OECD countries", OECD, *Economics Department Working Papers*, no 683, March.

Hayashi, F and E Prescott (2002): "The 1990s in Japan: a lost decade", *Review of Economic Dynamics*, vol 5, no 1, January, pp 206–35.

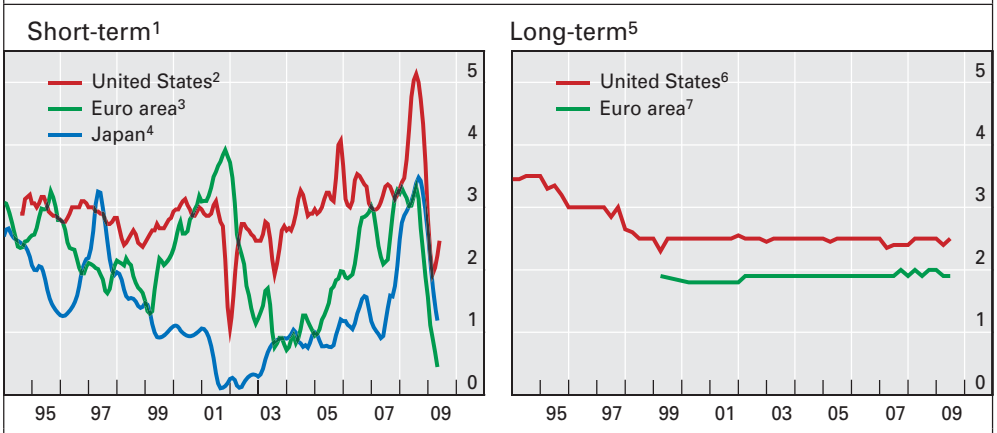
Second, potential output may be significantly reduced by the disruption in the credit intermediation system, falling trade and investment, and a possible rise in structural unemployment rates associated with the financial crisis (see box). If so, the output gap might be less negative than current trends would suggest, leading to an overestimation of disinflation pressures. Following the early 1970s oil price shock, for instance, the adverse impact of higher oil prices on potential output may well have been underestimated in advanced economies, leading to an underestimation of inflationary pressures.

In addition, labour costs are still rising

Third, recent wage developments do not suggest that a downward wage-price nexus has developed, at least in the G3 economies. Unit labour costs, for instance, rose by 4.8% in the euro area in the fourth quarter of 2008 year on year. In the United States, unit labour costs have also tended to rise at a faster rate in 2009 (2.2% in the first quarter, up from 1.6% in the fourth quarter of 2008). The rise in unit labour costs may partly reflect a cyclical downturn in productivity as well as the lagged adjustment of employment to a fall in

Inflation expectations

In per cent



[1] Based on consumer surveys for one-year-ahead inflation; three-month moving averages. [2] Median expected inflation. [3] Based on a diffusion index; figures are normalised by mean and variance of actual HICP inflation. [4] As of mid-2004, figures are calculated from shares of ranges in the questionnaire. [5] Based on surveys of professional forecasters. [6] Ten-year-ahead inflation. [7] Five-year-ahead inflation.

Sources: European Commission; Cabinet Office, Government of Japan; Datastream; University of Michigan; national data; BIS calculations. Graph IV.10

output, but it is also likely to reflect the degree of wage flexibility in an economy. In the euro area economies, for instance, firms' ability to reduce labour costs may be constrained by a degree of downward nominal wage rigidity.

Much depends on expectations about inflation

Such uncertainties highlight the key role of expectations in inflation prospects. Short-term inflation expectations of households in the G3 economies have fallen markedly since mid-2008, but long-term expectations have remained relatively stable (Graph IV.10). One downside risk is that a further sharp reduction in short-term inflation expectations, combined with doubts about the capacity of policy to arrest the downturn, may lead households to postpone spending, resulting in a larger than projected fall in the inflation rate or even a sustained period of declining prices. But if agents base their spending decisions on steadier expectations about long-term inflation, the risk of deflation will be considerably reduced. Also, a danger exists that long-term inflation expectations will rise if private agents come to believe that public debt burdens will not be manageable without higher inflation to erode that debt.[7]

Summing up

The global financial crisis has led to an unprecedented recession accentuated by rapid declines in trade volumes, large employment cuts and a massive loss of confidence. How deep and prolonged the downturn will be is uncertain. In the industrial countries, there are some signs that the rapid pace of decline in spending witnessed since the fourth quarter of 2008 has started to ease. But a strong, sustained recovery in those countries could be difficult given attempts by households and financial firms to repair their balance sheets. Nevertheless, substantial fiscal stimulus and exceptional monetary easing in many countries should help bring the recent contraction to an end. The policymakers' task in the near term will be to ensure a sustained recovery. In the medium term, however, it will be to ensure that policies are adjusted sufficiently to maintain the stability of long-term inflation expectations.

[7] See H Hannoun, "Long-term sustainability versus short-term stimulus: is there a trade-off?", speech at the 44th SEACEN Governors' Conference, Kuala Lumpur, 7 February 2009.

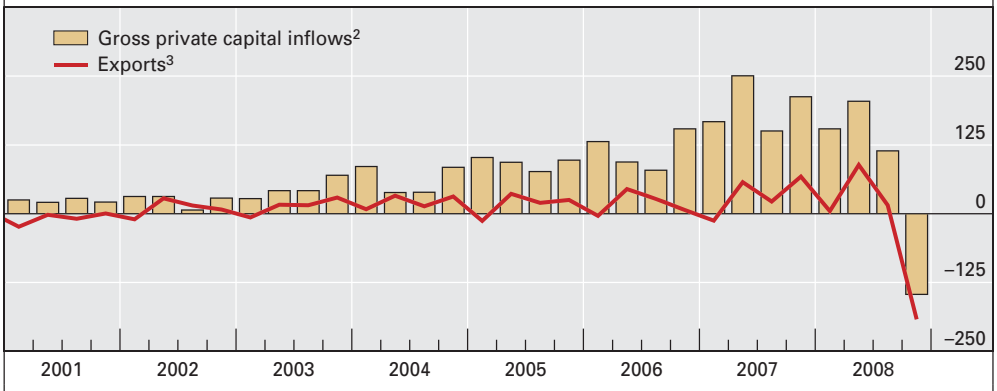
V. Fallout for the emerging market economies

The unfolding financial and economic crisis hit emerging market economies (EMEs) with full force in the final quarter of 2008. The bankruptcy of Lehman Brothers in September 2008 was followed by an unprecedented drop in export demand that coincided with a significant reversal in international bank lending and foreign portfolio investment. Exchange rates in many countries depreciated, equity prices declined and the cost of external financing rose sharply. Depressed consumer and investor spending in the advanced economies led to a slump in demand for EME exports, which reinforced the capital inflow reversal. An extended period of export-led growth supported by capital inflows thus came to an end (Graph V.1).

In examining these events, this chapter first sets the context by reviewing the pre-crisis period. Export-to-GDP ratios rose and investment – funded to a significant extent by foreign capital inflows – shifted to the tradable goods sector. In some major EMEs, notably China, this development was associated with very high saving that exceeded investment, resulting in large current account surpluses and reserve accumulation. In other EME regions, however, particularly in central and eastern Europe (CEE), current account deficits were large in spite of rapid export growth. Second, the chapter discusses some features of the recent downturn in economic activity in EMEs, and the difficulties encountered in boosting domestic demand. Third, drawing on BIS statistics, it discusses the sharp reversal in capital inflows, noting new vulnerabilities that arose because private sector external borrowing in EMEs remained high even when public sector external borrowing had declined.

Private capital inflows and exports[1]

In billions of US dollars



[1] Brazil, Chile, Chinese Taipei, the Czech Republic, India, Indonesia, Korea, Mexico, the Philippines, Poland, Russia, South Africa, Thailand, Turkey and Venezuela. [2] Foreign direct investment, portfolio investment and other investments in the respective economies. [3] Merchandise exports (fob), change over previous quarter.

Sources: IMF; CEIC; Datastream; national data. Graph V.1

Finally, it discusses two elements that have supported EME economic activity since the start of the crisis: foreign currency liquidity and resilient domestic credit.

Before the crisis

Strong but unbalanced growth

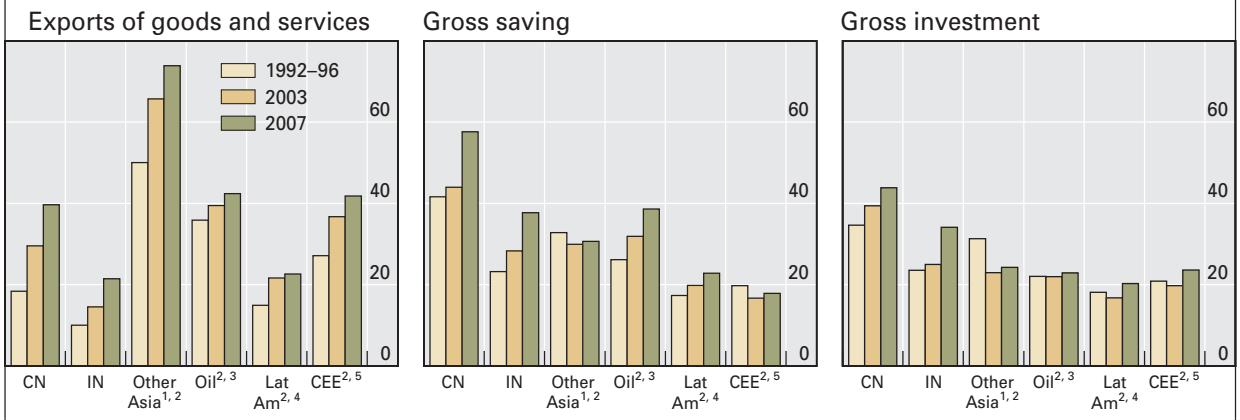
Before the onset of the crisis, EME growth had been very strong, but the structure of that growth planted some of the seeds of the recent downturn. From 2003 until mid-2008, most emerging economies experienced robust, export-led growth that was associated with increased gross saving and attracted large capital inflows. Foreign exchange reserves accumulated on an unprecedented scale, and economic and financial integration with the advanced economies proceeded rapidly and became more complex. In particular, the global integration of production chains made many EMEs more dependent on exports than they had been a decade or so earlier. In addition, the EMEs' financial sectors became more closely integrated with those of the advanced economies and dependent on them as a source of investment opportunities or, in some cases, net external finance.

Exports became more important

For the emerging markets as a group, real GDP growth accelerated to an average of 7.4% per year during 2003–07 from 6.0% during 1992–96, the period leading up to the Asian crisis. Much of this acceleration in growth came from improvements in production efficiency that reflected greater competition and the technological spillovers associated with increased exports. In China and India in particular, the ratio of exports to GDP was as much as 100% higher in 2007 than the average for 1992–96 (Graph V.2, left-hand panel). In other economies in emerging Asia, exports rose from already high levels to about 75% of GDP in 2007, and in CEE to more than 40% of GDP.

Exports, saving and investment

As a percentage of GDP



CEE = central and eastern Europe; CN = China; IN = India; LatAm = Latin America; Oil = oil exporters.

[1] Chinese Taipei, Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [2] Weighted average of the economies listed, based on 2005 GDP and PPP exchange rates. [3] Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Libya, Nigeria, Oman, Qatar, Russia, Saudi Arabia, the United Arab Emirates and Uzbekistan. [4] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [5] Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Turkey.

Source: IMF, *World Economic Outlook*. Graph V.2

The growing importance of exports for EMEs led to a significant shift in the structure of fixed investment. In Brazil, China, India, Korea and Poland, the average per-country investment in gross fixed capital in the tradable sectors (agriculture, mining and manufacturing) increased by 3.2 percentage points between 2003 and 2007, to 39% of total fixed investment. By comparison, in the first half of the 1990s tradable industries had accounted for about 28% of total fixed investment in China (vs 36% in 2003–07) and about 19% in Brazil (vs 56% in 2003–06).

Greater share of global gross saving ...

While the EMEs were becoming much more important in global trade, they were also becoming a key source of global saving (see Chapter IV). In gross terms, the share of EMEs in global saving rose from 25% in 1992–96 to 30% in 2003 and 40% in 2007. In comparison, the EME share of world GDP did not rise quite so rapidly, moving from 21% in 1992–96 to 31% in 2007.

... but large differences across regions

Saving-investment balances differed notably across EME regions in the 2003–07 period. In China, gross saving exceeded gross investment by a large margin: the saving rate reached 58% of GDP in 2007 even though China also maintained one of the highest investment rates in the world (44% of GDP in 2007; Graph V.2). Enterprises kept a growing portion of after-tax profits, and households upped their saving partly as a precaution against the diminishing social safety net. India saw a sharp rise in the saving rate as well, but the gain was more than matched by the increase in the investment rate. Other Asian emerging economies saw only a modest rise in saving and investment rates between 2003 and 2007, with both remaining below the levels preceding the Asian crisis (Graph V.2).

In contrast, in CEE (as well as in South Africa), gross investment exceeded gross saving by a wide margin, resulting in current account deficits of 5–7% of GDP for the region as a whole. These deficits were financed by relatively large private capital inflows – in this respect, CEE was similar to emerging Asia before the 1997 crisis. Another similarity between CEE and emerging Asia was the widespread use of foreign currency loans by borrowers without foreign currency income. However, there were also some important differences between the two regions. In particular, CEE countries opened their banking systems to foreign ownership and as EU members or candidates aligned their institutions, laws and governance practices with those of the European Union. CEE thus entered the current crisis with a legal, regulatory and supervisory framework that was stronger than emerging Asia's in 1997.

Large two-way capital flows

Finally, as a complement to EMEs' increased role in global trade and saving, their financial sectors rapidly integrated with those in the advanced economies. Foreign private portfolio investment in emerging market financial assets and cross-border lending by banks from advanced economies both increased significantly in the period preceding the current crisis. Gross private capital inflows to EMEs thus rose from 4% of their combined GDP in 2003 to 10.7% in 2007 (Table V.1), compared with an increase from 4.7% to 5.7% of GDP between 1992 and 1996. At the same time, companies from Brazil, China, India, Korea, Russia and several other EMEs became major direct investors in many advanced and developing countries. In addition, China, the oil-exporting countries and several other EMEs invested part of their official reserves

Gross private capital flows to and from emerging markets[1]

As a percentage of total GDP

	Annual average		2003	2007	2008
	1992–96	2003–07			
Total inflows	5.1	6.6	3.9	10.7	3.5
Direct investment	1.6	2.7	1.9	3.4	3.3
Portfolio investment	2.9	1.8	1.1	2.6	–0.3
Other investment	0.6	2.0	1.0	4.8	0.5
Total outflows	2.0	4.8	2.3	7.3	3.7
Direct investment	0.3	0.9	0.3	1.5	1.2
Portfolio investment	1.2	2.0	1.0	2.6	0.8
Other investment	0.6	1.8	1.1	3.2	1.7
Memo: Current account balance	*–1.7*	*3.9*	*2.3*	*4.6*	*4.4*
Change in reserves[2]	*–1.2*	*–5.5*	*–3.9*	*–7.8*	*–4.3*

[1] Algeria, Argentina, Azerbaijan, Brazil, Bulgaria, Chile, China, Colombia, Croatia, the Czech Republic, Estonia, Hungary, India, Indonesia, Iran, Kazakhstan, Korea, Kuwait, Latvia, Libya, Lithuania, Malaysia, Mexico, Nigeria, Oman, Peru, the Philippines, Poland, Qatar, Romania, Russia, Saudi Arabia, South Africa, Thailand, Turkey, the United Arab Emirates and Venezuela. [2] A minus sign indicates an increase.

Source: IMF, *World Economic Outlook*. Table V.1

(including through investment vehicles such as sovereign wealth funds) in the bonds and equities of advanced economies. Gross private capital outflows from EMEs thus rose from 2.3% to 7.3% of GDP between 2003 and 2007 (Table V.1), compared with an increase from 1.5% to 2.5% of GDP between 1992 and 1996.

Foreign reserves accumulated

The large capital inflows together with large current account surpluses led to strong appreciation pressures on many emerging market currencies. Until about 2007, concerns about appreciation had also led to substantial and prolonged intervention in foreign exchange markets, which resulted in large increases in foreign reserves. Foreign reserve growth in the larger EMEs accelerated from $0.3 trillion in 2003 to over $1 trillion in 2007, an unprecedented amount, but then slowed considerably in 2008 to $0.4 trillion, most of which was in China. However, as discussed below, foreign reserve holdings declined sharply in a number of EMEs after reaching peaks in 2008. Foreign reserves in EMEs stood at over $4.3 trillion in January 2009.

Domestic liquidity increased

Until the first half of 2008, very large foreign reserve accumulation was associated with increases in liquidity that were to varying degrees offset by sterilisation or the sale of government securities to the public. On balance, monetary conditions eased significantly, as reflected in low real interest rates and rapid growth in bank credit to the private sector. Real interest rates in Asia and Latin America fell between 2001 and 2005, to close to zero or lower, although they subsequently rose. Growth in domestic bank credit to the private sector in EMEs averaged over 23% per year in 2006 and 2007, with particularly rapid increases observed in Latin America (over 30%), CEE (24%) and Russia (nearly 50%). While credit growth had slowed significantly by the end of 2008, it remained close to 20% or higher in Latin America, India, Indonesia, CEE and Russia. One factor behind the increased liquidity was low interest rates in the advanced economies. In particular, many EMEs were reluctant to raise policy

rates when inflation was rising in 2007 and 2008, because of worries that higher policy rates would attract greater capital inflows and accentuate appreciation pressures.

Severe shock to the real economy

Partly protected by their relatively robust financial positions, including large foreign reserves (see below), EMEs were generally not severely affected by the global financial crisis between August 2007 and mid-2008. However, they have since been increasingly affected by two developments in the real economy: the fall in demand from industrial countries for consumer durables and the sharp decline in commodity prices.

Contracting economic activity

Collapsing growth in advanced economies led to a sharp contraction in economic activity in EMEs in the fourth quarter of 2008, with double digit declines in exports and industrial production and marked slowdowns in retail sales (Graph V.3). The synchronised fall in exports intensified in the first quarter of 2009 with an average year-on-year decrease of around 25% in a set of larger EMEs. In some commodity-exporting countries, notably Chile and Russia, exports fell by more than 40% in the first quarter of 2009.

Falling demand for consumer durables ...

The decline in spending on consumer durables in advanced countries over the second half of 2008 (see Chapter IV) has sharply reduced EME exports of automobile and information technology (IT) products. The automobile sector accounts for a significant share of GDP in a number of EMEs (3% in Turkey, 6% in Mexico, 8% in Korea and Thailand, and more than 10% in central Europe) and exports have declined rapidly, eg by 45% in Mexico in February 2009 and 54% in Turkey in the first quarter of 2009. The IT sector is especially important for East Asia and was largely responsible for the slowdown in the region during the 2001 US recession. In the current downturn the inventory-to-sales ratio of electronic goods has risen sharply in East Asia, and exports and production have decreased. For example, Korean IT export growth fell for six consecutive months, and the year-on-year decline for March 2009 was about 27%. The inventory-to-sales ratio for Korean IT products rose from 104% in September 2008 to a peak of 129% in December 2008 before falling to 93% in February 2009.

... and declining commodity prices

Turning to commodities, prices fell sharply as world growth slowed. Between July 2008 and March 2009, oil prices dropped by 65% and non-oil commodity prices by 34%. This has benefited commodity importers by increasing disposable income and reducing costs. However, commodity exporters have experienced declining incomes, which would tend to reduce demand and growth. For example, commodities make up more than 40% of total exports in Latin America (over 20% in Mexico). Recent IMF estimates imply that the 30% drop in commodity prices between July and December 2008 could reduce regional growth in Latin America by over 2 percentage points. The recent rebound in commodity prices (roughly 19% since the trough in December) may, however, help cushion any further declines in growth.

Economic activity

Annual changes, in per cent

[1] Merchandise exports (fob) in current US dollars. [2] For Indonesia and Venezuela, oil production. [3] In volume terms (for China, Mexico, Russia and Thailand, value data deflated by the consumer price index (CPI)); India, Malaysia, Peru, the Philippines and Turkey are excluded from the regional aggregates. [4] Weighted average of the economies listed, based on 2005 GDP and PPP exchange rates. [5] Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [6] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [7] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey.

Sources: International Energy Agency; IMF; Bloomberg; CEIC; Datastream; national data. Graph V.3

Inflation fell

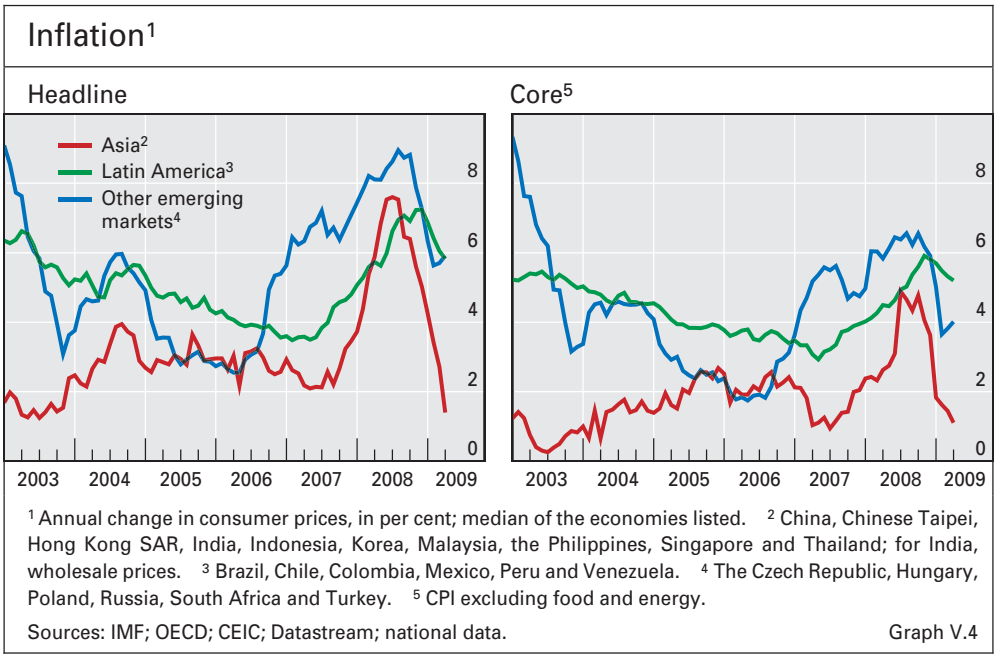
The plunge in commodity prices and the increased economic slack resulting from the sharp slowdown in growth have reduced the high rate of EME inflation, which is forecast to decline from 6.0% in 2008 to less than 5% in 2009. Headline and core inflation have fallen abruptly in Asia (Graph V.4), and underlying inflation in China and Thailand has exhibited deflationary tendencies in recent months. In China, the loss of foreign export markets has created overcapacity that has added to the downward pressure on prices. By contrast, inflation showed more persistence until early 2009 in Latin America and Russia. In some countries (eg Mexico and Russia), inflation concerns have been accentuated by depreciation pressures, a combination that poses a dilemma for monetary policy.

Prospects for recovery

Export dependence could slow recovery

The experience of the 20th century indicates that trade expansion will be needed to bring about a robust global economic recovery. In particular, export growth played an important role in recoveries from the emerging market crises of the 1990s, and research suggests that increased trade boosts economic growth over the medium term.[1] However, the heavy reliance of EMEs on external demand could delay recovery this time. One reason is the unprecedented severity of the import decline in advanced economies. For example, US imports are forecast to fall at double digit rates in 2009 (compared to 3% during the 2001 US recession). The corresponding forecast declines for the euro area and Japan are also in double digits. Another reason is that the scale of borrowing in advanced economies that had supported imports

[1] See J Frankel and D Romer, "Does trade cause growth?", *American Economic Review*, vol 89, no 3, June 1999, pp 379–99.



[1] Annual change in consumer prices, in per cent; median of the economies listed. [2] China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand; for India, wholesale prices. [3] Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [4] The Czech Republic, Hungary, Poland, Russia, South Africa and Turkey. [5] CPI excluding food and energy.

Sources: IMF; OECD; CEIC; Datastream; national data. Graph V.4

from EMEs in the past proved unsustainable. In the future, increases in developed country imports may need to be associated with higher exports to EMEs. More generally, deleveraging and the correction of global current account imbalances imply that saving has to rise or investment spending to fall in some advanced economies, and the reverse in some EMEs. This kind of adjustment may take time.

Limited ability to boost domestic demand

The outlook for recovery in EMEs also depends to a large extent on whether domestic demand is sufficiently resilient to offset the slowdown in demand from advanced economies. As noted in last year's Annual Report (Chapter III), there are a number of issues in this regard. In spite of robust growth and efforts by some EMEs to boost real consumption or investment spending, their share of GDP has generally not risen in this decade. During the current downturn, the ability to support consumption and investment spending will depend in part on the scope for countercyclical monetary and fiscal policies (see Chapter VI), which is limited in many EMEs. Furthermore, lower exports will tend to constrain investment and consumption spending by reducing prospective returns and incomes. So far, indicators of consumer and business sentiment in EMEs have declined sharply and retail sales have fallen in most EMEs.

What role for China?

China's apparent success in boosting domestic demand through fiscal stimulus measures and rapid domestic credit growth could help support the demand for exports in other countries. During the 2000s, the emergence of China as a global manufacturing hub has generated very large imports of intermediate and capital goods from other EMEs to produce final goods for export. However, the fall in demand for China's exports from the advanced economies has reduced China's demand for such imports. Other Asian EMEs are particularly affected, as China accounts for 20% of their exports on average. The extent to which China could offset this reduction by increasing its imports for domestic consumption appears to be limited. On the one hand, in response

to the significant stimulus provided, China's growth is expected to remain relatively high in 2009. In spite of a double digit decline in export revenues, industrial production growth has remained positive, retail sales growth has been robust (Graph V.3) and growth in credit has accelerated. On the other hand, some research suggests that China's propensity to import for its own domestic demand is small. Indeed, China's imports other than for export processing fell sharply in the last quarter of 2008, and have shown no recovery to date.

Looking ahead, considerable uncertainty surrounds the outlook for EMEs. Consensus forecasts for GDP growth in 2009 are negative for most of the larger EMEs, with the exception of China and India. Growth is forecast to be positive in most EMEs only in 2010. However, early signs of recovery are already apparent in some EMEs, including a pickup in China's exports to the European Union and the United States in March 2009 and increases in China's imports from Chinese Taipei and Korea in February and March 2009. These increases in trade reversed declines that had been observed for about half a year, but whether they indicate a sustained recovery remains unclear. The path of recovery will also depend on the rate at which international capital flows, which have played such a large role in supporting growth, recover from the sharp reversals experienced in 2008.

More difficult external financing

Most emerging market crises of the 1980s and 1990s were associated with reversals in gross private capital inflows that reflected a loss of confidence in emerging market policies. Developments in capital flows during the current crisis are somewhat different. With the notable exception of some CEE countries, many emerging market economies adopted sound policies before the crisis and thus were more resilient to reversals in capital flows, at least initially. But as the crisis progressed, some developments in capital flows followed a pattern similar to that of past crises. As described below, countries with larger current account and fiscal deficits, and sectors with significant foreign exchange exposures on their balance sheets, were more affected by the tightening of external financing conditions and withdrawals of capital.

Initial resilience in capital flows ...

During the first half of 2008, gross capital inflows to EMEs held up remarkably well, in many cases reaching 60–70% of the record high inflows in 2007. Capital inflow reversals were felt for the most part in equity markets, where prices began to slide after reaching historical peaks in the last quarter of 2007. The fact that other investors (banks and bondholders) maintained their positions in EMEs may be attributed to a number of factors cited earlier, including much larger official foreign exchange reserves and more robust banking systems in many cases. Better developed local bond markets also played a role in some countries.

International banks started to withdraw funding from some emerging markets in the third quarter of 2008. At first, countries with sound and relatively liquid banking systems were affected. For instance, cross-border loans to banks and the non-bank sector in China, Chinese Taipei, the Czech Republic,

Malaysia and Poland decreased by $30 billion in the third quarter. Central banks and market commentary at the time suggested that some international banks may have reduced loans to these EMEs in order to overcome severe liquidity shortages in their home markets.

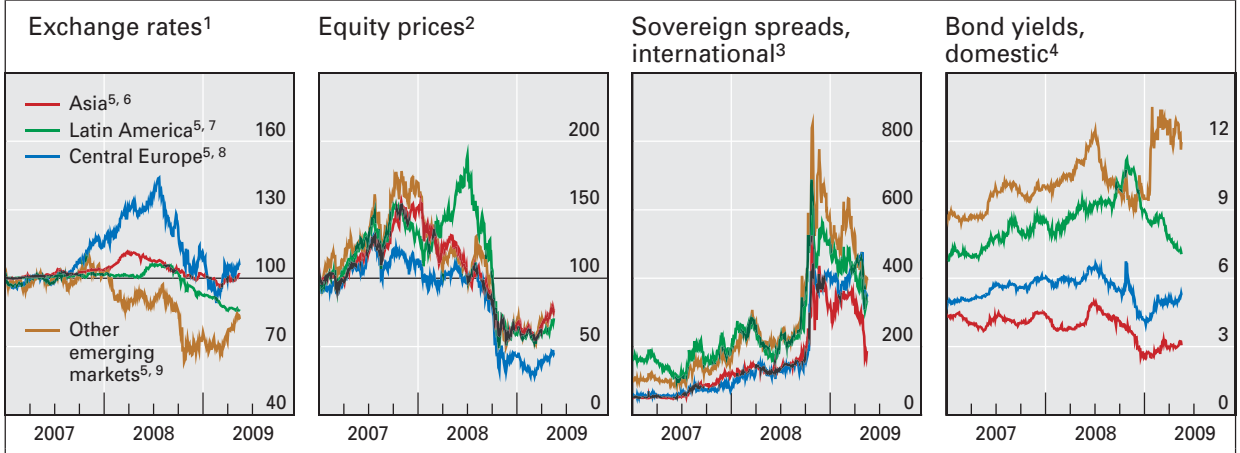
... followed by disruptions

Disruptions in emerging market finance became more widespread following the 15 September 2008 collapse of Lehman Brothers and the resulting interruptions in financing in global interbank markets (see Chapter II). Reversals of portfolio equity inflows accelerated, emerging market currencies weakened substantially, spreads on international sovereign bonds widened sharply and domestic bond yields rose in many EMEs (Graph V.5). Among the first to be affected by the rising cost and reduced availability of external finance were countries with large current account deficits (eg CEE countries and South Africa), and those where surpluses decreased due to the slump in oil and commodity prices (eg Argentina, Russia and Venezuela).

Exposures in the corporate sector

In the EMEs with more robust external positions, the initial impact on capital flows came via the corporate sector. As exchange rates depreciated sharply against the major international currencies, corporations that had borrowed heavily in international debt and credit markets to finance investment (eg Russian energy companies) encountered difficulties rolling over that debt. In addition, the turmoil in September 2008 had revealed some types of vulnerabilities of which the authorities and markets previously seemed to have been unaware. In particular, many corporations in Brazil, Korea, Mexico and Poland had entered into derivative contracts with foreign or domestic banks during 2007 and 2008 to protect export earnings against a sharp appreciation of local currencies and, in some cases, to speculate on a continuing appreciation. These positions were typically held off corporate balance sheets.

Financial market developments



[1] In terms of US dollars per unit of local currency; 31 December 2006 = 100. [2] Morgan Stanley Capital International equity indices, in US dollar terms; 31 December 2006 = 100. [3] JPMorgan EMBI Global (EMBIG) sovereign spreads over US Treasury yields (for Korea and Thailand, CMA five-year credit default swap premia), in basis points. Chinese Taipei, the Czech Republic, India and Singapore are excluded from the regional aggregates. [4] Five-year bond yields (for the Philippines, 10-year; for Turkey, two-year), in per cent. [5] Median of the economies listed. [6] China, Chinese Taipei, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [7] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [8] The Czech Republic, Hungary and Poland. [9] Russia, South Africa and Turkey.

Sources: Bloomberg; Datastream; JPMorgan Chase; MSCI; national data. Graph V.5

When local exchange rates fell against the dollar or the euro, the corporations suffered heavy losses, currently estimated at about 0.8% of GDP in Korea and more than 1% of GDP in Poland.

Flows to emerging bond markets evaporated

In international debt markets, primary issuance froze and secondary trading of emerging market bonds was greatly reduced in September and October, even for highly rated corporations and sovereigns with relatively sound fiscal positions (eg Brazil, Malaysia and South Africa). After net borrowing of $28 billion during the first three quarters of 2008, the last quarter saw net repayments by EMEs of $27 billion (Table V.2), as many emerging market corporate borrowers lost their access to international capital markets. Net repayments were especially large in Korea, Latin America and oil-exporting countries (Graph V.6). Syndicated loan issuance in the fourth quarter decreased by a total of $65 billion compared with the third quarter, with Hong Kong SAR, Singapore and countries in the Middle East being affected in particular. In addition, non-resident holdings of local EME currency bonds declined, reflecting not only increased demand for cash by foreign investors but also their risk aversion, as local bond markets in many EMEs (including Hungary, Indonesia, Mexico and Turkey) had become highly volatile.

More severe reversal of cross-border loans

The reversal in cross-border banking flows also became more severe in the last quarter of 2008. According to the latest BIS international banking statistics, banks from advanced economies reduced cross-border loans to developing countries by $205 billion during the fourth quarter (1% of the combined GDP of EMEs), reversing more than 60% of the inflows recorded during the previous three quarters (Table V.2). Brazil, China, Korea, Turkey and oil-exporting countries, including Russia, were particularly affected (Graph V.7). Loans to banks declined more sharply than loans to the non-bank sector. At the same time, residents of many EMEs (especially in central Europe and oil-exporting countries, including Russia) withdrew part of their deposits and other foreign assets held in BIS reporting banks. This provided an important cushion to the emerging markets that had been unavailable in the past. However, some deposit withdrawals may have reflected official foreign exchange intervention rather than the autonomous response of emerging market banks to the reduced availability of cross-border finance.

Does foreign bank ownership matter?

One question of interest is whether the presence of foreign banks in EMEs has had any visible impact on banking flows. This question can be addressed by assessing whether cross-border loans and local currency loans

International bank flows and bond issuance

In billions of US dollars

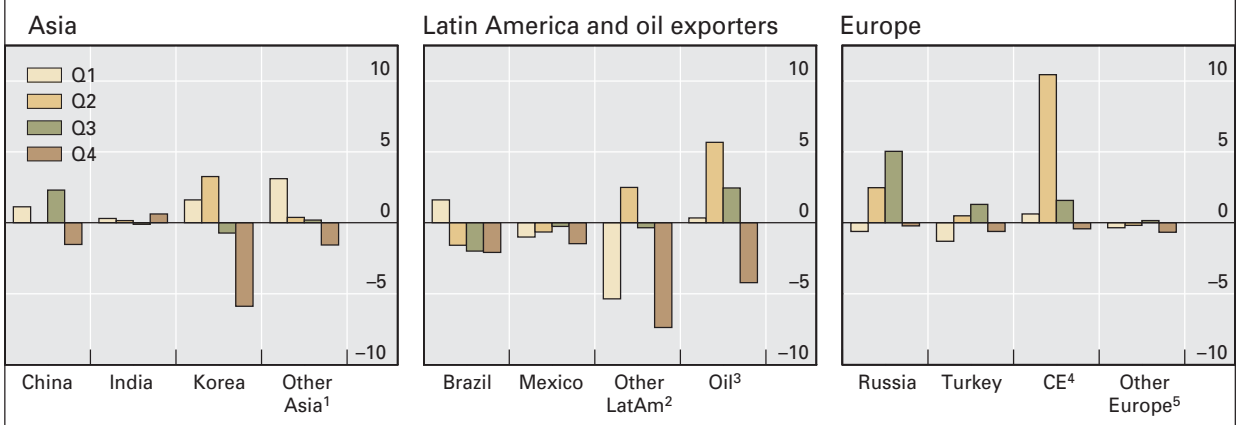
	Q1 2008	Q2 2008	Q3 2008	Q4 2008	Q1 2009
Cross-border loans[1]	168	105	47	–205	…
International bonds, net issuance	–1	23	6	–27	4

[1] External loans of BIS reporting banks vis-à-vis EMEs; estimated exchange rate adjusted changes.

Source: BIS. Table V.2

International debt securities

Net issuance by residence in 2008, in billions of US dollars



[1] Indonesia, Malaysia, the Philippines and Thailand. [2] Argentina, Chile, Colombia, Peru and Venezuela. [3] Algeria, Iran, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, Saudi Arabia and the United Arab Emirates. [4] The Czech Republic, Hungary, Poland and Slovakia. [5] Bulgaria, Croatia, Estonia, Latvia, Lithuania and Romania.

Source: BIS. Graph V.6

of foreign bank affiliates in EMEs have been more stable in countries with a larger foreign bank presence.

Temporary resilience of cross-border loans ...

Cross-border loans appear to have been temporarily more stable in some smaller countries with a larger foreign bank presence. In particular, smaller economies in CEE (the Baltic states and countries in southeastern Europe), whose banking systems are almost fully foreign-owned, were less affected by the decline in cross-border loans to banks in the fourth quarter of 2008 than were the larger CEE economies (the Czech Republic, Poland, Russia and Turkey), where foreign bank ownership is not dominant (with the exception of the Czech Republic) (Graph V.7, right-hand panel).

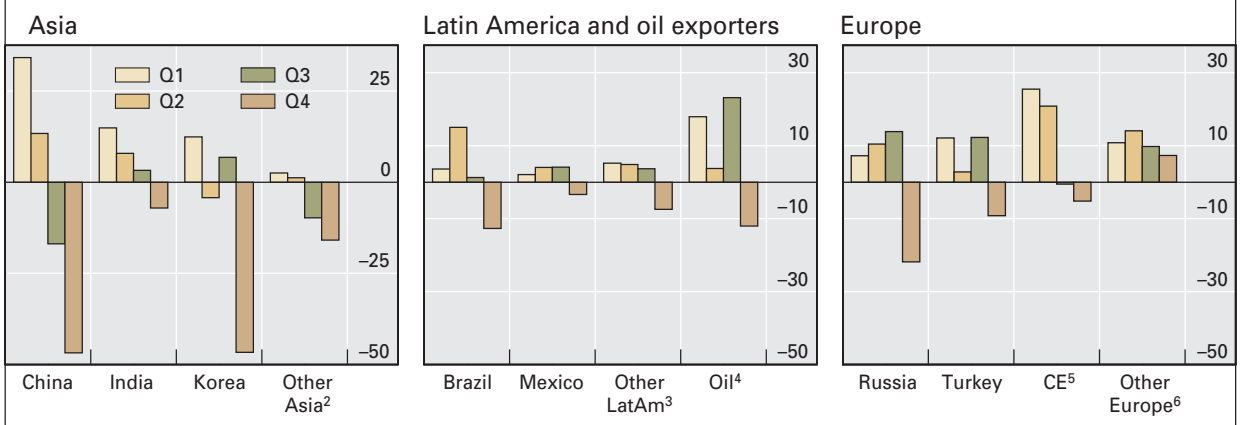
The resilience of cross-border loans in smaller CEE countries is surprising because many of them have sizeable external deficits. However, in February 2009 it became clear that the state of these economies was deteriorating faster than expected. Many borrowers faced challenges repaying or rolling over their loans. The loss of investor confidence suddenly exposed long-standing vulnerabilities, such as the widespread practice of foreign currency borrowing by households and by small and medium-sized enterprises. Whether parent banks from western Europe have maintained support for their subsidiaries in these smaller countries will become clearer after the release of data for the first quarter of 2009 in early July.

... and mixed performance of local claims

As for local currency loans, whether such loans have been more stable in countries where foreign-owned banks have a larger presence remains unclear. Adjusting for exchange rate changes, local currency claims of foreign bank affiliates have exhibited resilience in a number of EMEs; for example, in the fourth quarter of 2008 these claims increased in Brazil, China, Poland and Turkey, and remained stable in smaller CEE economies with a large foreign bank presence. However, they decreased in some other countries (eg Korea and South Africa).

Cross-border loans[1]

2008, in billions of US dollars



[1] Estimated exchange rate adjusted changes in external loans of BIS reporting banks vis-à-vis all sectors. [2] Indonesia, Malaysia, the Philippines and Thailand. [3] Argentina, Chile, Colombia, Peru and Venezuela. [4] Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Libya, Nigeria, Oman, Qatar, Saudi Arabia and the United Arab Emirates. [5] The Czech Republic, Hungary, Poland and Slovakia. [6] Bulgaria, Croatia, Estonia, Latvia, Lithuania, Romania and Serbia.

Source: BIS locational banking statistics. Graph V.7

Do local bond markets matter?

Another question of interest is whether countries with more developed local bond markets have fared better in the face of capital outflows. EMEs had in recent years sought to reduce their vulnerability to capital inflow reversals by increasing issuance in domestic debt markets. However, the crisis appears to have prompted investors (particularly foreign ones) to attempt to withdraw from local bond markets in EMEs and switch to more liquid foreign currency assets. These attempts affected local bond markets in Hungary, Indonesia, Mexico and Turkey, among others, and exacerbated depreciation pressures in many cases, given the severe impairment of the operation of international currency swap markets at the time (Graph II.4, centre panel). For example, in Hungary there were no bidders at government bond auctions in mid-October. Non-resident holdings of local currency bonds declined as well, reflecting increased demand for foreign currency by foreign investors. At the same time, international banks were not prepared to swap euros for forints, triggering a sharp depreciation with contagion effects throughout CEE (eg the Czech koruna fell by 9% against the euro during the fourth quarter despite much sounder fundamentals).

Problems in trade finance emerged

In late 2008 and early 2009, the severe contraction in external demand compounded the negative effects of the global financial crisis on emerging market capital flows. The effects were especially evident in the case of trade finance. In Latin America, for instance, leading international banks were reportedly renewing just 50–60% of the previous year's trade credit lines in the first quarter of 2009. A major part of this decrease reflected lower trade volumes and commodity prices. But the decrease was also due to the drying-up of the secondary market for trade finance and reduced credit lines from banks specialising in the provision of such finance. Although it has also affected some Asian exporting economies, the lack of trade credit may be most serious for African nations because of their underdeveloped financial systems and the inability of governments to increase the supply of such credit.

FDI less affected so far ...

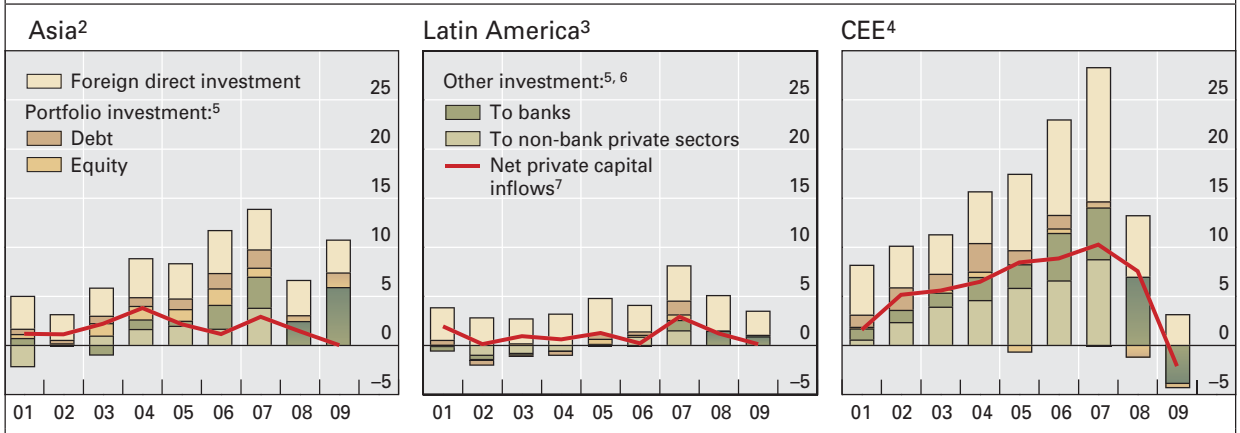
The behaviour of foreign direct investment (FDI) flows, which have been more stable than other capital flows in previous crises, also raises concerns. Gross FDI inflows held up fairly well in 2008 compared with 2006–07, especially in emerging Asia and Latin America (Graph V.8). However, recent reports indicate that FDI inflows were lower in a number of countries in early 2009. One reason is that roughly one third of recent FDI inflows were related to mergers and acquisitions, which are typically financed by international bank loans. Significantly lower issuance of syndicated loans in the fourth quarter of 2008 and the first quarter of 2009 provides some support for this view. In addition, profit remittances from some EMEs increased sharply, as many multinational enterprises, in the same way as international banks, needed liquid funds in their home markets. According to the OECD Development Centre, reinvested earnings and intracompany loans are also being sharply curtailed as companies repatriate financial resources to their parents.

... but the outlook is highly uncertain

Since the current crisis is associated with an unprecedented contraction in global economic activity, it is extremely uncertain when and how far private capital inflows to emerging markets might recover. Equity markets have rebounded strongly since March 2009. In addition, international bond issuance resumed in the first quarter of 2009 (Table V.2), but only for high-grade sovereigns and top-rated corporates, and even then at much higher premia than in early 2008. Furthermore, because the crisis originated in the financial systems of advanced economies, the standard remedy in the past – reforming policies in emerging market economies – is not likely to restart the flow of capital to EMEs on its own. Moreover, it is not clear how global current account imbalances – which were an important factor in the surge of capital flows to and from emerging markets in the period before the crisis – will eventually be resolved.

Composition of gross private capital inflows[1]

As a percentage of GDP



[1] Gross inflows are simple averages of the economies listed; for 2008 and 2009, estimates from *World Economic Outlook*. [2] China, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. [3] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. [4] Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Turkey. [5] For 2008 and 2009, breakdowns of portfolio and other investment are not available. [6] Negative values indicate a decrease in foreign ownership of domestic assets classified under other investment inflows. [7] Regional totals as a percentage of regional GDP.

Sources: IMF, *International Financial Statistics, World Economic Outlook*. Graph V.8

Factors supporting economic activity

Apart from the scope for countercyclical policies discussed in Chapter VI, two factors will influence the extent to which activity in EMEs can be maintained in the face of declining exports and capital inflow reversals. One is the degree of success in stabilising foreign exchange markets and maintaining the flow of foreign currency financing, through the provision of foreign currency liquidity by authorities. The other is the stability and lending capacity of the domestic banking system, which are related to the financial condition of banks and recent measures to support the financial sector.

Provision of foreign currency liquidity

Central banks intervened

As noted earlier, an important feature of the current crisis is that many sovereigns had reduced or stabilised their external debt in the pre-crisis period, but private external debt had remained high or increased. As capital inflows reversed, central banks took steps to ensure the availability of foreign currency so that the private sector could meet its payment obligations. They intervened in foreign exchange markets to stabilise them and dampen exchange rate volatility. They also used their foreign reserves to smooth the flow of external financing to the private sector, seeking in particular to reduce rollover risks and cover shortfalls in trade financing by providing funding or guarantees.

While conditions in EME foreign exchange and funding markets appear to have stabilised relative to the period of extreme financial stress around October and November 2008, markets remain comparatively unsettled, and there has been no full recovery (Graph V.5).

Concerns about reserve adequacy

One concern is that intervention in foreign exchange markets has in some cases entailed a very large depletion of foreign reserves. For example, in the first quarter of 2009, foreign reserves were at 80% of their June 2008 levels in Korea and India, around 75% in Poland and 65% in Russia. Given the possibility that external shocks could persist, such depletions raise questions about reserve adequacy, although conventional indicators suggest that reserve holdings are still ample. In spite of significant interventions in the fourth quarter of 2008, many EMEs still had larger foreign reserves at the end of 2008 than they did in 2007 (Table V.3). Furthermore, a well known rule of thumb (the so-called Guidotti-Greenspan rule) is that foreign reserves should cover 100% of external debt coming due within one year. In 2008, almost all EMEs far exceeded this threshold – coverage was more than 400% in Asia and Russia and around 300% in Latin America. Another rule of thumb, that foreign reserves should cover three to six months of imports (ie 25–50% of annual imports) was also typically exceeded at the end of 2008. These figures suggest that many EME central banks could meet the foreign currency financing requirements of the private sector for well over one year. However, a severe economic downturn and a delayed recovery in capital inflows could produce future episodes of market instability that could lead to a much faster draining of reserves than suggested by these indicators. Under these conditions, the withdrawal of financing to EMEs could severely impair the pace of economic recovery.

Foreign reserve adequacy[1]

Outstanding year-end reserves position

	In billions of US dollars				As a percentage of:								
					GDP	Short-term external debt[2]				Imports			
	96	07	08	09	08	96	07	08	09	96	07	08	09
Asia[3]	477	2,907	3,320	3,355	45	170	449	589	595	49	84	74	83
China	105	1,528	1,946	1,954	44	376	1,249	1,865	1,873	76	160	172	186
India	20	267	247	242	20	260	339	333	324	55	123	85	88
Korea	33	262	200	212	21	45	176	173	177	22	73	46	55
Other Asia[4]	319	850	927	948	52	145	389	502	511	48	69	62	72
Latin America[5]	142	397	440	410	13	145	238	369	300	89	82	71	69
Brazil	58	179	193	186	12	111	292	342	329	109	149	111	115
Chile	16	17	23	24	14	201	86	113	114	89	38	40	47
Mexico	19	86	94	84	9	60	256	241	218	21	31	30	29
CEE[6]	53	227	233	211	17	504	114	107	92	36	51	43	...
Middle East[7]	17	58	54	47	9	111	98	112	90	34	51	41	...
Russia	11	467	413	368	25	42	486	509	446	16	209	141	143
Memo:													
Net oil exporters[8]	*93*	*883*	*885*	*...*	*21*	*200*	*1,050*	*1,862*	*...*	*42*	*98*	*87*	*...*

[1] Regional aggregates are the sum of the economies listed; for percentages, simple averages. For 2009, latest available data. [2] Consolidated cross-border claims of all BIS reporting banks on countries outside the reporting area with a maturity of up to one year plus international debt securities outstanding with a remaining maturity of up to one year. [3] Countries listed. [4] Chinese Taipei, Hong Kong SAR, Indonesia, Malaysia, the Philippines, Singapore and Thailand. [5] Countries listed plus Argentina, Colombia, Peru and Venezuela. [6] Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. [7] Kuwait, Qatar and Saudi Arabia. For Saudi Arabia, excluding investment in foreign securities. [8] Algeria, Angola, Kazakhstan, Mexico, Nigeria, Norway, Russia, Venezuela and the Middle East.

Sources: IMF; Datastream; national data. Table V.3

A further consideration is that foreign reserve adequacy also depends on other characteristics of the economy not captured by conventional indicators. For example, Chile's foreign reserve holdings have been comparatively low relative to its short-term external debt and its export revenues have fallen sharply; however, its foreign reserves have been remarkably stable and the Chilean peso rebounded earlier than other Latin American currencies. One reason is that the government (through its sovereign wealth fund) and households (through pension funds) have large holdings of foreign assets. In spite of lower returns on international investments that may have temporarily influenced the exchange rate, the robustness of the financial and corporate sectors has on balance helped to limit calls on these foreign reserves. By the same token, countries with much larger foreign reserve holdings but less robust financial systems might be less resilient.

Alternatives to foreign reserves

In this setting, an important issue is how much EMEs might rely on external resources or reserve pooling arrangements rather than costly foreign reserve holdings to improve resilience. The crisis has led to three unprecedented measures that could eventually reduce the need for large foreign reserve holdings. First, in October 2008 four EME central banks each entered into a $30 billion reciprocal currency arrangement with the US Federal Reserve. Second, a $120 billion multilateral facility, drawing on international reserves, was recently established in East Asia. This significantly extends the scope of

existing bilateral currency swap facilities set up under the so-called Chiang Mai initiative. Third, recent G20 initiatives have called for large increases in resources for international financial institutions, supporting steps taken by these institutions to enhance the scope and effectiveness of their crisis-related operations. An important development in this context is the decision of some EMEs (Colombia, Mexico and Poland) to seek access to the IMF's recently created Flexible Credit Line, which targets countries with sound macroeconomic fundamentals.

Resilience of banking systems and credit

Increased demand for domestic credit

The sharp reversal in cross-border bank financing cited earlier (Graph V.7) has affected both the non-bank and banking sectors in EMEs. Corporate borrowers facing reduced access to external funding have sought to borrow in the domestic market instead. One indicator of how much domestic credit would have to rise if all external borrowing shifted to domestic banks is the ratio of non-bank external borrowing to bank domestic credit. Data for the third quarter of 2008, before cross-border bank flows fell sharply, show that this ratio was around 45% in Mexico and Turkey, and about 30% in central Europe, the Baltic states and southeastern Europe.

Bank lending capacity could be limited

Meeting this increased demand for credit could help support continued economic activity. But domestic banks' ability to do so may be limited, in particular, by reductions in their own access to external financing. The extent of vulnerability varies considerably across countries: the ratio of loans to deposits is above unity (indicating a possible reliance on external financing) in Hungary, Korea and Russia, countries that have experienced significant pressure in foreign exchange markets, but also in Colombia and South Africa, where such pressures have been much lower. Another indicator of reliance on external financing – the share of foreign liabilities in the total liabilities of the banking system – has ranged from about 15 to 30% in Hungary, Korea, Poland, Russia and South Africa.

Bank credit resilient

However, in spite of sharp declines in cross-border bank lending to non-banks and banks in the fourth quarter of 2008, credit growth, while slowing, remained in double digits (over year-earlier levels) in many EMEs well into the first quarter of 2009. Indeed, in a number of EMEs, domestic bank credit has remained stable or been on an upward trend (Graph V.9).

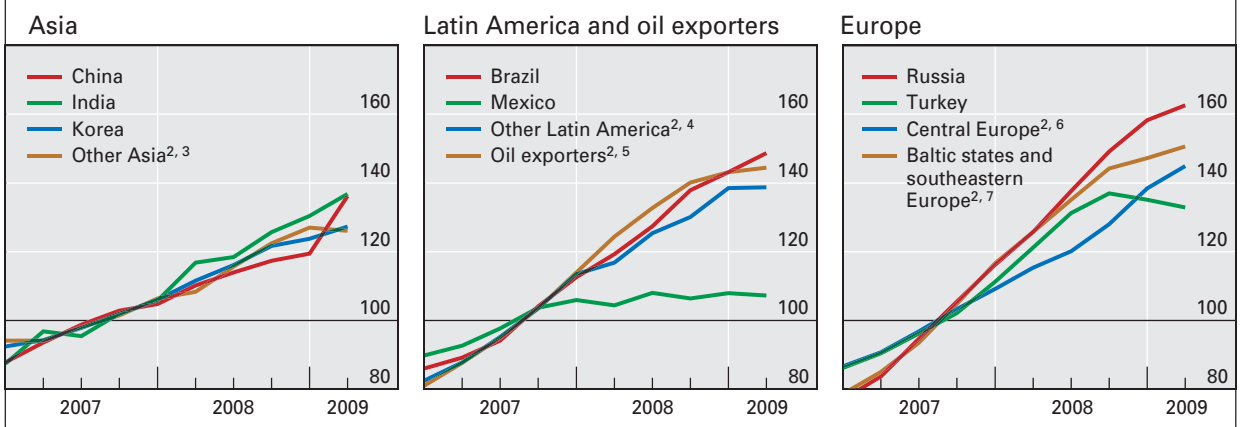
Banking strength has played a role …

One factor that may have supported domestic credit growth is the strength of EME banking systems, which has improved considerably in the course of this decade. Profitability (as measured by the median[2] return on assets across countries for a group of 23 larger EMEs) rose from less than 1% at the beginning of the decade to 1.5% in 2007. By 2007, the larger EMEs typically had regulatory capital ratios well in excess of the minimum Basel threshold of 8%, with median ratios of around 13%. In some countries (eg Brazil, Indonesia, Turkey) regulatory capital ratios were around 19%. Median non-performing loan

[2] The median is more suitable as a measure of the central tendency if we want to know whether a representative (50%) share of the sample of countries has performed better over time. In contrast, a simple average would give more weight to unusually good or unusually poor performance, even if it applies only to a very few countries and is therefore not representative.

Domestic bank credit to the private sector[1]

2007 = 100



[1] In nominal and local currency terms. [2] Weighted average of the economies listed, based on 2005 GDP and PPP exchange rates. [3] Indonesia, Malaysia, the Philippines and Thailand. [4] Argentina, Chile, Colombia, Peru and Venezuela. [5] Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Libya, Nigeria, Oman, Qatar, Saudi Arabia and the United Arab Emirates. [6] The Czech Republic, Hungary, Poland and Slovakia. [7] Bulgaria, Croatia, Estonia, Latvia, Lithuania and Romania.

Sources: IMF; national data. Graph V.9

(NPL) ratios declined from around 10% at the beginning of the decade to less than 3% in 2007. However, these tend to be lagging indicators. An alternative indicator, Moody's Financial Strength Index, which rates banks according to their standalone (ie excluding external support) capacity, also shows significant improvement, although strength ratings tend to be low. Excluding two financial centres with relatively high strength ratings (Hong Kong SAR and Singapore), the median rating rose from 26 (out of a possible 100) in December 1998 to 34 in January 2008 and then fell to 33 by April 2009.

... as have efforts to support domestic banks

Another factor that may have supported credit growth is the move by EME authorities to provide domestic liquidity and to furnish support to domestic banking systems. As discussed further in Chapter VI, these measures have included provision of central bank liquidity through monetary operations, lower policy rates and reserve requirements. Deposit guarantees, support to banks (including, in some cases, bank recapitalisation), measures to stabilise money and capital markets, and steps to ensure financing to priority borrowers such as small and medium-sized enterprises have also contributed to lowering the cost of financing and maintaining the flow of bank credit in EMEs.

Risk that resilience will be temporary

However, there is a significant risk that this resilience will be temporary and domestic credit will decline sharply. One concern is that, as we know from past experience, the severity of the ongoing economic slowdown could worsen banks' balance sheets by sharply raising NPLs, even though a large increase is not currently forecast.

Conclusions

Two concerns arising from the global economic crisis may be highlighted. First, there is a significant risk that economic recovery in EMEs will be delayed. In particular, there is a risk of a destabilising negative feedback loop: the severity

of the downturn could deter a recovery in capital flows to EMEs, which could in turn further impair growth. Economic recovery is also likely to require a rebound in trade with reduced global imbalances; but bringing about the needed adjustments in both EMEs and advanced economies could take time. In this setting, domestic credit, whose resilience has supported economic activity, could decline sharply given the depth of the economic downturn.

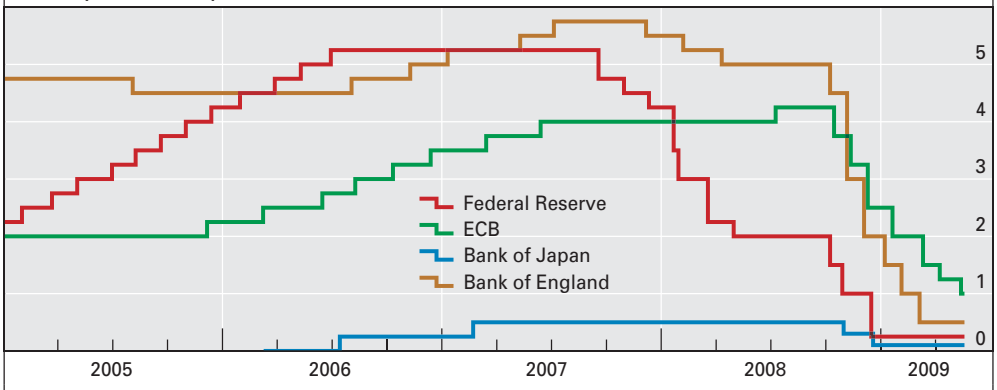
Second, in response to a sharp reversal in capital inflows, EMEs have relied on foreign exchange market intervention and other measures to provide foreign currency liquidity. This has helped stabilise economic activity by ensuring the continued functioning of foreign exchange markets and smoothing the flow of financing to EMEs. Looking ahead, an important question is whether available EME foreign reserves and new initiatives that have considerably enhanced the availability of foreign currency resources (eg bilateral foreign currency swaps involving EME central banks, reserve pooling arrangements and recent large increases in official financing for EMEs) will help bring about an early recovery in capital flows to EMEs. Over the medium term, these new initiatives could also help EMEs reduce their reliance on reserve accumulation, which in turn could contribute to reduced global imbalances.

VI. Policy responses to the crisis

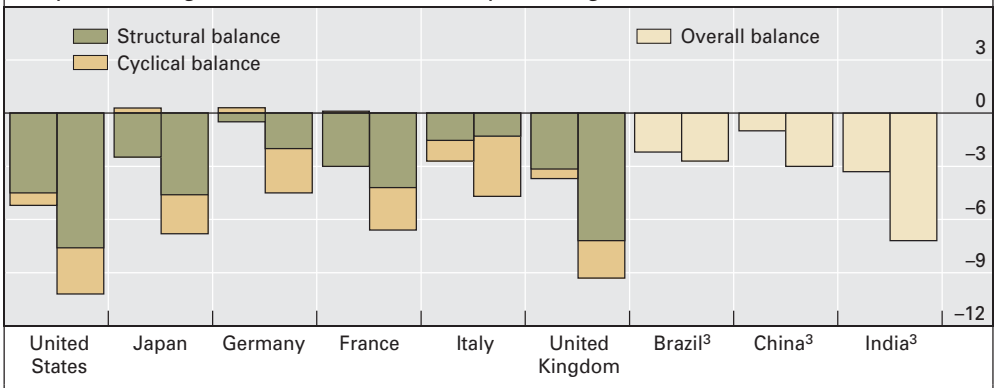
The intensification of the global financial crisis during the third stage in September–October 2008 and the subsequent sharp downturn of the world economy in the fourth stage (see Table I.1 for an overview of the stages of the crisis) led to an unprecedented response by policymakers. Central banks around the world cut policy rates aggressively, in many cases to levels near zero (Graph VI.1, top panel). Normally, this would have provided a massive stimulus to economic activity, but the dysfunctional state of the financial system severely blunted the impact of lower interest rates. Major central banks therefore took additional measures. At the same time, a first wave of bank rescue packages unveiled in the last quarter of 2008 turned out to be insufficient to stabilise the financial system. Governments were thus

Monetary and fiscal policy

Policy rates,[1] in per cent



Expected budget balance for 2009,[2] as a percentage of GDP



[1] For the Federal Reserve, target federal funds rate; for the ECB, interest rate on the main refinancing operations; for the Bank of Japan, target for the uncollateralised overnight call rate; for the Bank of England, Bank rate. [2] Projections before September 2008 (first column) and latest (second column). [3] Breakdown not available.

Sources: OECD, *Economic Outlook*; Bloomberg; JPMorgan Chase; national data. Graph VI.1

subsequently forced to modify their terms and expand their scope. Towards the end of 2008, it became increasingly clear that neither monetary policy nor rescue packages were sufficient to prevent a sharp contraction of the real economy. Governments responded by introducing sizeable fiscal stimulus to support aggregate demand (Graph VI.1, bottom panel).

The exceptional deterioration in the outlook for the economy in late 2008 and early 2009 clearly called for extraordinary policy actions, which are discussed in some detail in the next three sections of this chapter. At this writing, the ability of those plans to generate a sustained recovery is an open question. The major reasons for doubt, discussed in the final section, are limited progress in addressing the underlying problems of the financial sector and the risks associated with the expansionary fiscal and monetary policies put into place during the period under review.

Monetary policy

Slowing growth and high inflation in mid-2008 ...

In the middle of 2008, amidst the financial turmoil, central banks faced the twin problems of slowing output growth and persistently high inflation. The extent and timing of the slowdown differed across countries. Economic growth in the major advanced economies had been relatively strong in early 2008, but turned negative towards mid-year (see Chapter IV). Emerging market economies continued to experience solid growth, but the export-oriented economies of East Asia and central Europe showed signs of slowing before the crisis of confidence in September and October (see Chapter V). Inflation rates were well above (implicit or explicit) targets almost everywhere, owing to sharp rises in food and energy prices during the first half of 2008.

... complicated policy choices

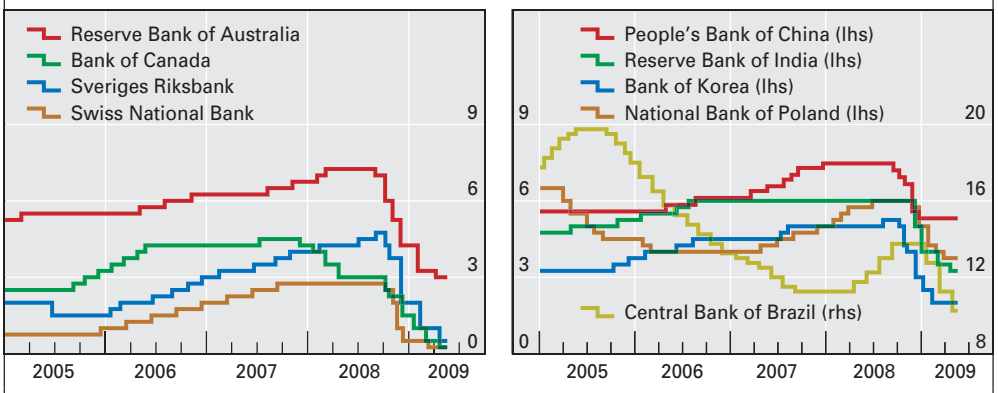
Finding the appropriate monetary policy response in this environment proved challenging. With the benefit of hindsight, one can see that policymakers underappreciated the extent of the slowdown in mid-2008 and the strength of the associated disinflationary forces. Although slowing growth would at some point create the slack necessary to stabilise prices, few central banks expected inflation to fall before late 2009. In the meantime, there was a real danger that persistently high inflation might feed into permanently higher inflation expectations, which in turn could result in a higher pass-through from commodity prices to other prices and wages. As a consequence, central banks in both advanced and emerging market economies either held rates constant or raised them.

Sharp reductions in policy rates after the Lehman failure

The 15 September bankruptcy of Lehman Brothers, followed by weeks of extreme pressure in the credit markets, escalating threats to the stability of major financial institutions and an accelerating pullback in economic activity, marked a turning point for the world economy and for monetary policy. On 8 October, when they simultaneously announced cuts in their policy rates, six major central banks undertook the first ever round of coordinated rate action. Other central banks around the world also began rapidly cutting rates (Graph VI.1, top panel, and Graph VI.2). The worldwide declines in output and inflation in the fourth quarter of 2008 and early 2009 far exceeded those implied by the downside risks to growth identified only a few months before.

Central bank policy rates[1]

In per cent



[1] For the Reserve Bank of Australia, target cash rate; for the Central Bank of Brazil, overnight SELIC target rate; for the Bank of Canada, target overnight rate; for the People's Bank of China, one-year working capital; for the Reserve Bank of India, reverse repo rate; for the Bank of Korea, base rate (up to March 2008, overnight call target rate); for the National Bank of Poland, seven-day reference rate; for Sveriges Riksbank, repo rate; for the Swiss National Bank, midpoint of the three-month Libor target range.

Sources: Bloomberg; national data. Graph VI.2

By the end of May 2009, the Federal Reserve, the Bank of Japan, the Bank of England, the Bank of Canada, Sveriges Riksbank and the Swiss National Bank had brought policy rates close to zero. The European Central Bank lowered its main policy rate by 3¼ percentage points between September 2008 and May 2009, but stopped well before it reached the zero lower bound. However, the ample supply of central bank balances from late 2008 onwards pushed overnight rates close to the rate on the ECB's deposit facility, and thus almost to zero. Central banks in many emerging market economies also reduced interest rates, albeit from a much higher level.

A run on the currency limited room for manoeuvre in some economies

Not all central banks had room to lower policy rates. A run on the currency forced the central banks of Hungary, Iceland and Russia to tighten policy in late 2008 despite declining inflation and slowing real activity, although they started to reduce policy rates gradually over the course of the following months.

A dysfunctional financial system …

Notwithstanding the rapid and sizeable easing in policy rates after the bankruptcy of Lehman Brothers, the limitations of interest rate policy became more apparent in many countries. Financial market tensions and the rise in credit and liquidity risk premia (see Chapter II) impaired the transmission mechanism. For example, yields on corporate bonds increased despite sharp declines in policy rates. Banks generally passed reductions in their funding costs on to their customers, but they tightened credit standards significantly, offsetting the impact of cuts in the policy rate on overall financial conditions (see Chapter IV).

… and the zero lower bound limited the effectiveness of interest rate policy

As policy rates in many countries reached historically low levels, the zero lower bound became a binding constraint, making it impossible to follow policy rules that called for negative nominal interest rates in many advanced economies in view of widening output gaps and falling inflation rates. Moreover, a number of considerations led central banks to stop easing once

policy rates reached a level slightly above zero. Given that bank deposit rates are generally below money market rates, the former may reach zero even if the latter are still positive. When that happens, any further reduction in market rates may not be passed on to households and firms, as banks need to maintain a margin between deposit and lending rates to remain profitable. Similarly, money market mutual funds may become unprofitable once rates fall to a certain level.

Broadening the scope of policy

A general framework for assessing policy responses

In this context, many central banks took additional steps to improve the functioning of credit markets and to ease financial conditions. Given the unprecedented breadth of actions in many countries, it is useful to outline a framework for reviewing the various facets of central banks' responses.

Liquidity operations in normal times ...

Nowadays, central banks generally conduct monetary policy through targets on very short-term interest rates. This approach comprises two core elements: signalling the desired policy stance through the announcement of a key interest rate (the policy rate);[1] and liquidity management operations, defined broadly to encompass various aspects of the operating framework – including the maturity, pricing and collateral requirements for central bank liquidity – that supports the desired stance by keeping the relevant market rate consistent with the policy rate. Typically, liquidity management operations are designed and implemented carefully to ensure that they influence only the specific market rate targeted by policy. As such, they play a supportive role, neither impinging upon nor containing any information relevant to the stance of policy.

... and in periods of stress

Liquidity management operations, however, can also be used deliberately to influence specific elements of the monetary transmission mechanism, such as certain asset prices, yields and funding conditions *over and above* the impact of the policy rate. In this case, liquidity operations no longer simply play a passive role but become an integral part of the overall monetary policy stance. Such operations generally result in substantial changes in central banks' balance sheets – in terms of size, composition and risk profile. They will henceforth be referred to as *balance sheet policy*.

Balance sheet policy varies in the choice of market targeted ...

The various forms of balance sheet policy can be distinguished by the particular market that is targeted. The most common, familiar form is sterilised foreign exchange intervention. Here, purchases or sales of foreign currency seek to influence the level of the exchange rate separately from the policy rate that defines the official policy stance. In the current crisis, balance sheet policy has also been employed to target term money market rates, long-term government bond yields and various risk spreads. While the justification, underlying mechanics, channels of influence and balance sheet implications are analogous to the case of foreign exchange intervention, the *choice of market* is atypical and in some cases unprecedented. It is the choice of market that renders recent central bank actions "unconventional", not the overall

[1] The policy rate can take the form of a rate actually set by the central bank in its operations, such as the ECB's minimum bid rate, or may be simply an announced target for a market rate, such as the Federal Reserve's target federal funds rate.

approach of seeking to influence specific elements of the transmission mechanism over and above the policy rate.

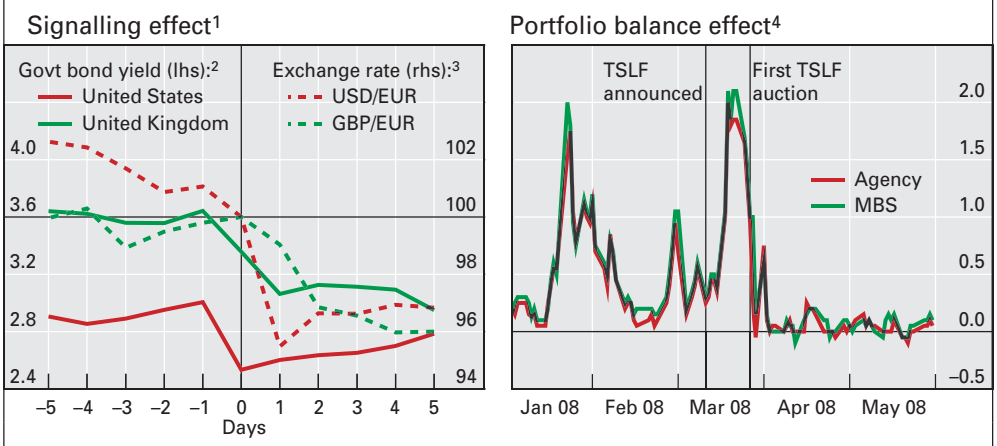
... and can be implemented regardless of the interest rate level

An important feature of balance sheet policy is that it can be implemented *regardless* of the prevailing interest rate level. Foreign exchange interventions, for example, are routinely carried out in this manner. As long as central banks possess the capacity to carry out offsetting operations on reserve balances, neither expanding asset holdings nor altering their composition will necessarily impinge on central banks' ability to maintain their policy rates close to target. Indeed, many Asian central banks that intervened actively in foreign exchange markets in recent years have been able to attain their official interest rate targets despite sizeable expansions of their balance sheets.

Balance sheet policy operates via signalling ...

In principle, the effects of balance sheet policy may be transmitted through two main channels. The first is a signalling effect, analogous to that used to attain short-term interest rate targets. In this case, operations undertaken by the central bank, or their communication, influence public expectations about key factors that underpin an asset's market valuation. Those factors include expectations regarding the future course of policy, inflation, relative scarcities of different assets or their risk and liquidity profiles. For example, the announcement that the central bank is prepared to engage in operations involving illiquid assets may in itself boost investor confidence in those assets, thereby reducing liquidity premia and stimulating trading activity. The signalling effect can be quite powerful, as illustrated by the sharp drop in long-term government bond yields and exchange rates in the United States and the United Kingdom following announcements by the Federal Reserve and the Bank of England of plans for outright purchases of the respective government bonds (Graph VI.3, left-hand panel; see Chapter II for further examples).

Signalling and portfolio balance effects



[1] The policy announcement day 0 is: for the United Kingdom, 5 March 2009; for the United States, 18 March 2009. [2] Ten-year bond yields, in per cent. [3] Rebased to period 0 = 100. A decrease implies a depreciation of the US dollar or pound sterling against the euro. [4] Spread between the overnight agency or agency mortgage-backed security (MBS) repo rate and the overnight Treasury general collateral (GC) repo rate, in percentage points.

Sources: Bloomberg; BIS calculations. Graph VI.3

... and portfolio balance effects

The second channel – a broader version of the standard portfolio balance effect – works through the impact of central bank operations on the composition of private sector portfolios. When assets are imperfect substitutes for one another, changes in relative asset supplies brought about through central bank operations materially alter the composition of portfolios. To compensate, relative asset yields typically need to change, and such changes may in turn influence the real economy. To the extent that this process leads to stronger balance sheets, greater collateral values and higher net worth, it may help loosen credit constraints, lower external finance premia and hence revive private sector intermediation. For example, when risky private securities are purchased from banks in exchange for risk-free claims on the public sector, the resultant improvement in the overall risk profile of bank balance sheets may enhance both the willingness and the ability of banks to lend.

A clear illustration of the portfolio balance effect in the current episode is the impact of the Federal Reserve's Term Securities Lending Facility (TSLF) on repo financing spreads between Treasury and non-Treasury collateral – a gauge of the relative scarcity of the two types of collateral. The effectiveness of such securities lending operations comes directly from their impact on the relative supplies of collateral in the market. As such, the observation that repo financing spreads declined only after the TSLF was implemented – and not when it was announced – demonstrates the influence of the portfolio balance effect that is clearly distinct from the signalling effect (Graph VI.3, right-hand panel).

Quantitative easing and credit easing

There is ongoing debate as to whether the particular structure of central bank liabilities matters for the effectiveness of balance sheet policy. For example, the focal point of quantitative easing – as used to describe operations by the Bank of Japan during 2001–06 – is the expansion of bank reserves, which are on the liabilities side. Credit easing operations by the Federal Reserve in the current episode, on the other hand, concentrate squarely on the asset composition of the central bank's balance sheet and the influence that this has on private sector credit conditions. From the perspective of quantitative easing, bank reserves are special either in their ability to act as a catalyst for bank lending or because they contribute to market stability and confidence. Credit easing, on the other hand, does not attach particular significance to bank reserves, implicitly treating the various forms of central bank liabilities as very close substitutes, not only for one another but also for certain kinds of government debt. From this perspective, the manner in which balance sheet policy is funded – be it by issuing central bank bills, issuing short-term treasury bills and depositing the proceeds at the central bank, or simply increasing bank reserves (which may be interest bearing) – is of secondary importance as far as effectiveness is concerned. Clearly, policy communication also differs significantly between the two approaches.

An overview of central bank responses

Central banks adopted three types of measures:

The conceptual framework just described can be usefully employed to assess central bank responses to the crisis so far. In particular, the responses can be divided into three broad categories according to how the associated operations

Central bank responses to the crisis

Objective	Measures adopted	Fed	ECB	BoE	BoJ	BoC	RBA	SNB
Achieve the official stance of monetary policy	Exceptional fine-tuning operations	✓	✓[1]	✓	✓	✓	✓	✓
	Change in reserve requirements			✓[2]				
	Narrower corridor on overnight rate	✓[3]	✓	✓				
	Payment of interest on reserves	✓			✓[4]			
	Increased treasury deposit	✓				✓		
	Short-term deposit or central bank bill		✓	✓	✓		✓	✓
Influence wholesale interbank market conditions	Modification of discount window facility	✓[5]		✓				
	Exceptional long-term operations	✓	✓[6]	✓	✓	✓	✓	✓
	Broadening of eligible collateral	✓	✓	✓	✓	✓	✓	✓
	Broadening of counterparties	✓		✓	✓	✓	✓	
	Inter-central bank FX swap lines	✓	✓	✓	✓	✓	✓	✓
	Introduction or easing of conditions for securities lending	✓		✓	✓	✓		
Influence credit market and broader financial conditions	CP funding/purchase/collateral eligibility	✓[7]		✓[8]	✓[9]	✓[10]	✓[11]	
	ABS funding/purchase/collateral eligibility	✓[12]	✓[13]	✓[8]			✓[11]	
	Corporate bond funding/purchase/collateral eligibility			✓[8]	✓[14]	✓[10]		✓
	Purchase of public sector securities	✓[15]		✓[8]	✓[16]			
	Purchase of other non-public sector securities				✓[17]			✓[18]

Fed = Federal Reserve; ECB = European Central Bank; BoE = Bank of England; BoJ = Bank of Japan; BoC = Bank of Canada; RBA = Reserve Bank of Australia; SNB = Swiss National Bank. ✓ = yes; blank space = no.

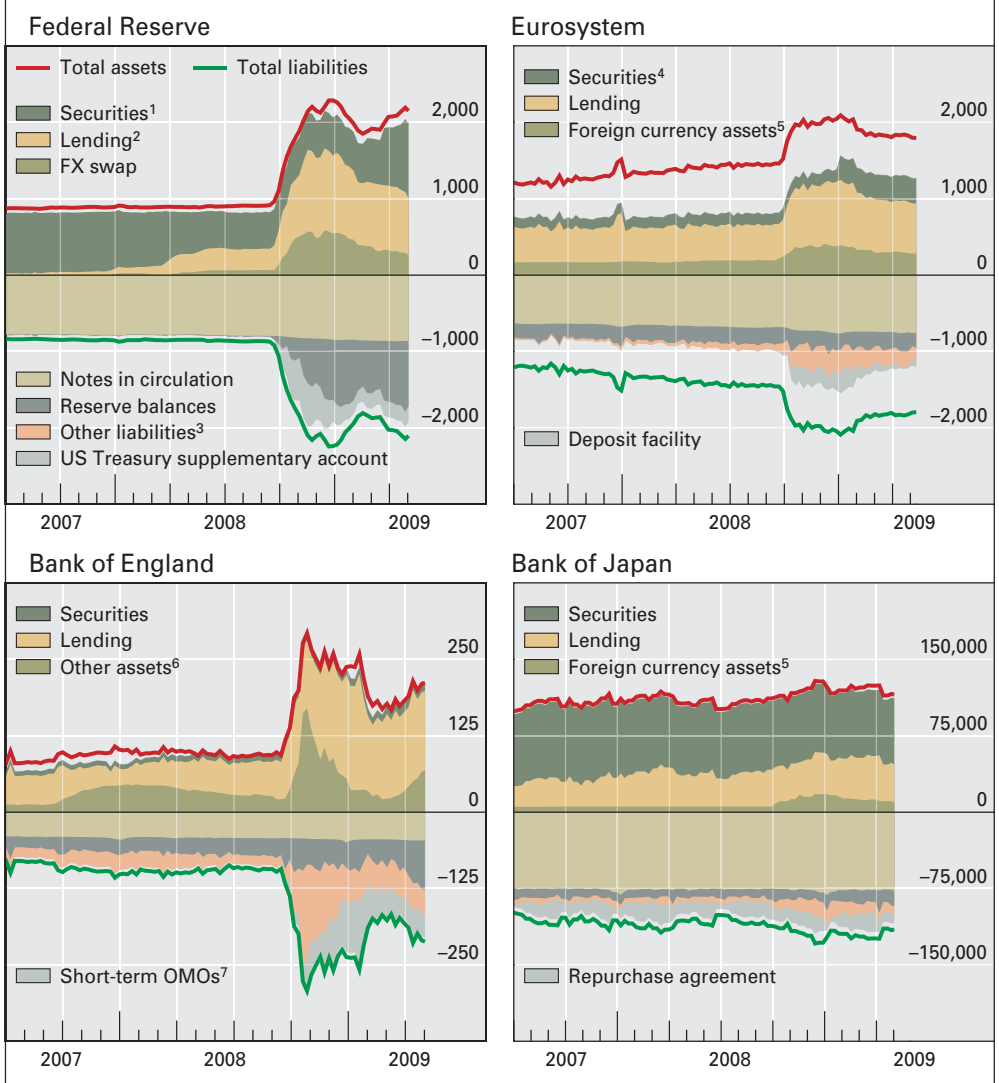
[1] Including front-loading of reserves in maintenance period. [2] Expand range over which reserves are remunerated. [3] Lower the discount rate relative to the target federal funds rate. [4] Pay interest on excess reserve balances (Complementary Deposit Facility). [5] Reduce rate and expand term on discount facility; allow participation of primary dealers (Primary Dealer Credit Facility). [6] Including fixed rate full-allotment operations. [7] Finance purchase of short-term certificates of deposit, commercial paper (CP) and asset-backed CP (ABCP) (Money Market Investor Funding Facility, Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility and Commercial Paper Funding Facility (CPFF)). [8] Asset Purchase Facility. [9] Increase frequency and size of CP repo operations and introduce outright CP purchases. [10] Term Purchase and Resale Agreement Facility for Private Sector Instruments. [11] Acceptance of residential mortgage-backed securities and ABCP as collateral in repo operations. [12] Finance purchase of asset-backed securities (ABS) collateralised by student, auto, credit card and other guaranteed loans (Term Asset-Backed Securities Loan Facility). [13] Purchase of covered bonds. [14] Expand range of corporate debt as eligible collateral and introduce loan facility against corporate debt collateral. [15] Purchase Treasury debt as well as direct obligations of and MBS backed by housing-related government-sponsored enterprises. [16] Purchase Japanese government bonds to facilitate smooth money market operations; not intended to influence bond prices. [17] Purchase equity held by financial institutions. [18] Purchase foreign currency securities.

Source: National data. Table VI.1

are related to their proximate objectives (Table VI.1). The first category consists of measures to ensure that the market rate is consistent with the policy rate. The second involves initiatives to alleviate strains in wholesale interbank markets. The third consists of responses aimed at supporting specific credit markets – particularly the non-bank segments – and easing financial conditions more broadly. The last two categories, insofar as they involve operations directed at particular segments of the transmission mechanism over and above the traditional interest rate target, fall under the umbrella of balance sheet policy.

Central bank assets and liabilities

In billions of respective currency units



[1] Securities held outright (including TSLF). [2] Repurchase agreements, term auction credit, other loans and CPFF. [3] Including to central banks. [4] Issued by euro area residents and general government debt in euros. [5] Including US dollar liquidity auctions. [6] Including US dollar liquidity auctions and asset purchase facility. [7] Open market operations, including issuance of Bank of England sterling bills.

Sources: Datastream; national data. Graph VI.4

With respect to the first category, the implementation of interest rate targets largely involved accommodating the greater instability in the demand for reserves through a more flexible supply, in terms of both size and frequency. To help anchor short-term rates to the policy target, the Bank of England and the Federal Reserve also reduced the width of the effective corridor on overnight rates by changing the rates applied on end-of-day standing facilities. At the same time, central banks had to expand their capacity to reabsorb excess reserves to neutralise the impact on overnight interest rates of the much expanded operations. As reflected in the composition of central bank liabilities, this was implemented in a number of ways (Graph VI.4). The Bank of England and the Swiss National Bank began

operations to ensure the attainment of the interest rate target;

Box VI.A: Policy coordination by central banks during the crisis

Information sharing with other monetary authorities is part of the daily routine of central bankers. They share many aspects of their policy frameworks and economic thinking with each other and thus are likely to adopt similar measures when facing common challenges, but explicit coordination among central banks is unusual. And while coordinated intervention to limit exchange rate movements was not infrequent in the past, it has become rare – at least among central banks in industrial economies.

During the current financial crisis, however, central banks have coordinated actions to an unprecedented extent. This box investigates some of the reasons why coordination was a preferred policy option.

Coordinated actions during the crisis: liquidity and interest rates

The closest coordination has been seen in efforts to address foreign currency funding shortages in interbank markets, especially for US dollars.① The strains in the US dollar money markets during the crisis rendered it very difficult for non-US banks to obtain US dollar funding, as reflected in dislocations in the foreign exchange swap markets and increased Libor-OIS spreads (see Chapters II and III). In response, the Federal Reserve established swap lines with central banks in Europe to alleviate the US dollar shortage there. After the Lehman failure, it became clear that the growing shortage in US dollar funding needed to be addressed in all major markets simultaneously; the swap lines were subsequently expanded in both scale and geographical scope (Table VI.A). Similar arrangements were later put in place to address the euro and Swiss franc shortage in Europe; existing swap lines were also drawn upon to address the yen shortage in Asia.

Interest rate policies are usually not coordinated, but on 8 October 2008 a number of central banks in the industrial economies took the unprecedented step of jointly announcing interest rate cuts.

Coordinated policy actions by central banks during the crisis

	Dec 07	Mar 08	Sep 08	Oct 08	Nov 08	Jan 09	Feb 09
Central banks providing liquidity (currency)	**Liquidity policy:** Swap lines announced with the central banks of:						
Federal Reserve (USD)	CH, XM		JP, GB, AU, CA, DK, NO, SE	BR, KR, MX, NZ, SG			
Swiss National Bank (CHF)				XM	PL	HU	
ECB (EUR)				DK, HU[1]	PL[1]		
Nordic central banks[2] (EUR)		IS					
Riksbank (SEK)							EE
	Interest rate policy: Joint interest rate cut by the central banks of:						
				CA, XM, CH, SE, GB, US			

AU = Australia; BR = Brazil; CA = Canada; CH = Switzerland; DK = Denmark; EE = Estonia; GB = United Kingdom; HU = Hungary; IS = Iceland; JP = Japan; KR = Korea; MX = Mexico; NO = Norway; NZ = New Zealand; PL = Poland; SE = Sweden; SG = Singapore; US = United States; XM = euro area.

In December 2008, the Bank of Japan expanded an existing bilateral JPY/KRW swap line with the Bank of Korea. In April 2009, the Bank of England, the ECB, the Bank of Japan and the Swiss National Bank announced swap lines for the purpose of providing their local currencies to the Federal Reserve, if required.

[1] Based on repo agreements. [2] In Denmark, Norway and Sweden.

Source: National data. Table VI.A

Why did coordination take place?

The provision of foreign exchange through swap lines had advantages on both sides. For instance, addressing the US dollar shortage of foreign banks helped the Federal Reserve to enhance its control over the rates paid for US dollar funding in money markets and reduced the risk of "fire sales" of dollar-denominated assets by foreign institutions. Admittedly, in its domestic operations the Federal Reserve was already providing US dollar liquidity to US affiliates of non-US banks through various programmes. However, extending direct liquidity distribution to foreign banks across more time zones and institutions would have involved the challenges of setting up additional lending arrangements, including modifying requirements for collateral or assessing the credit risk of these counterparties. By contrast, through swap lines with other central banks, the Federal Reserve could use the existing infrastructure of lending by the foreign central bank to its domestic financial institutions, including settlement arrangements and monitoring of counterparties and eligible collateral. Lending via the foreign central bank also helped to align liquidity support operations with the foreign central banks' supervisory responsibilities.

For the foreign central bank, the shortages of foreign currency funding for its domestic counterparties posed a potential threat to the stability of the economy's financial system. The central bank could have mobilised existing foreign exchange reserves or used foreign exchange borrowed from the market. But those strategies are unattractive in a crisis if foreign exchange reserves are limited or foreign exchange markets are impaired – hence the attraction of accessing a swap line with another central bank.

Finally, policymakers may want to be seen to be cooperating during a global crisis, thereby increasing confidence. Indeed, this is the most compelling explanation for the coordinated interest rate cuts in October 2008.

Did it work?

Many market participants reported that the extended swap facilities improved term funding conditions.[2] Indeed, actual usage peaked in late October and gradually declined thereafter, with some central banks never actually having drawn on the swap lines. Foreign exchange swap market deviations declined in particular in EUR/USD and CHF/USD, and overall Libor-OIS spreads narrowed. While many other policy actions were taken at the same time, it seems fair to say that some of this improvement was due to the introduction of central bank swap lines.

[1] The details of central bank swap lines during the crisis are discussed in C Ho and F-L Michaud, "Central bank measures to alleviate foreign currency funding shortages", *BIS Quarterly Review*, December 2008, pp 14–15. [2] See N Baba and F Packer, "From turmoil to crisis: dislocations in the FX swap market before and after the failure of Lehman Brothers", paper presented at the conference *The global financial crisis: causes, threats and opportunities*, Warwick, 6 April 2009.

to issue central bank bills; the ECB and the Reserve Bank of Australia relied increasingly on accepting interest bearing deposits; and the Federal Reserve took in greater amounts of deposits from the Treasury and started to pay interest on reserves.

to alleviate strains in wholesale interbank markets;

The second group of measures, prominent during the first two crisis stages, centred on reducing term interbank market spreads, seen as an indicator of tensions in that key market segment. This was tackled both directly, by providing more term funding so as to offset some of the shortfall in market supply, and indirectly, by addressing impediments to the smooth distribution of reserves in the system and ensuring access to funding from the central bank. To this end, conditions for the provision of reserves were eased by relaxing eligible collateral and counterparty coverage, lengthening the maturity of refinancing operations, and establishing inter-central bank swap lines to alleviate mostly dollar funding pressures in offshore markets (as well as offshore funding pressures in a few other currencies; see Box VI.A and Chapter II). The use of the swap lines was a significant driver of balance sheet expansions for

major central banks during this period (Graph VI.4).[2] In addition, many central banks introduced or eased conditions for lending out highly liquid securities – typically sovereign bonds – against less liquid market securities in order to improve funding conditions in the money market.

and to influence credit markets and broader financial conditions

The third category of policy responses, which received more emphasis as the turmoil in financial markets deepened (stages three to five of the crisis), focused on directly alleviating tightening credit conditions in the non-bank sector and easing broader financial conditions. Prominent measures included the provision of funds to non-banks to improve liquidity and reduce risk spreads in specific markets – such as commercial paper, asset-backed securities and corporate bonds – as well as the direct purchase of public sector securities to influence benchmark yields more generally. In a notable step, the Swiss National Bank intervened in the foreign exchange market to contain upward pressure on the Swiss franc as part of its efforts to reduce deflationary risks and loosen monetary conditions more generally.

The emphasis of operations varied across countries

As a by-product of these actions, central bank balance sheets expanded substantially and their composition changed significantly (Graph VI.4). An important difference across countries is the relative emphasis given to private versus public sector securities and bank versus non-bank markets. The Federal Reserve focused heavily on non-bank credit markets as well as on operations involving private sector securities, as exemplified by measures such as the Commercial Paper Funding Facility and the Term Asset-Backed Securities Loan Facility (part of "Lending" in Graph VI.4, top left-hand panel). The Bank of England, on the other hand, initially concentrated its Asset Purchase Facility primarily on purchases of government bonds (part of "Other assets" in Graph VI.4, bottom left-hand panel), while the ECB emphasised banking system liquidity by conducting fixed rate full-allotment refinancing operations with maturities of up to 12 months (part of "Lending" in Graph VI.4, top right-hand panel) and by purchasing covered bonds. In the case of the Bank of Japan, substantial efforts were directed at improving funding conditions for firms through various measures pertaining to commercial paper and corporate bonds. The varying emphasis reflects, in part, differences in financial structures. More direct intervention in non-bank credit markets in the United States, for example, is consistent with that country's predominantly market-based system, while the greater focus accorded in the euro area to supporting banks reflects a larger reliance on bank-based intermediation in the region.

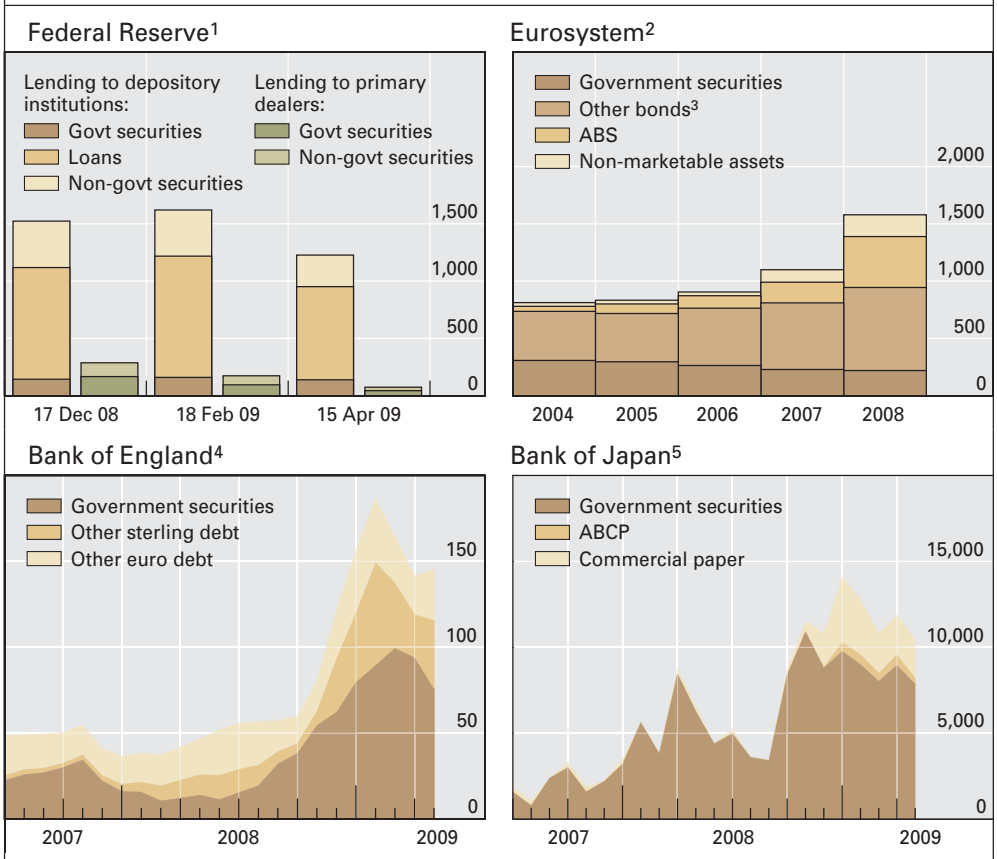
Close cooperation with the fiscal authority is needed

Greater reliance on balance sheet policy has entailed an increasingly pervasive role for central banks in the intermediation process and a more significant influence on the relative supplies of claims on the public sector. This heightens the need for close cooperation with the fiscal authority for two key reasons. First, large purchases of government securities and the accompanying rapid expansion of central bank liabilities affect the overall profile of public sector debt. Their effect could potentially be undermined by debt management operations, not least given their typically larger size, unless

[2] Amounts drawn under the swap lines appear on the assets side of the central banks' balance sheets, and on the liabilities side as domestic currency liabilities to foreign central banks (as long as the foreign central bank does not make use of the foreign currency obtained through the swap).

Central bank collateral

In billions of respective currency units



[1] Collateral pledged to various facilities. [2] Collateral pledged in Eurosystem credit operations. [3] Including covered, uncovered and corporate bonds and other marketable assets. [4] Monthly average value of collateral held for monetary policy. [5] Assets purchased under repurchase agreements by the Bank of Japan.

Sources: Datastream; national data. Graph VI.5

the objectives of the two types of operations are consistent. Second, central banks are taking on greater credit and market risk, as evidenced by the higher proportion of private sector securities in the collateral accepted in monetary operations (Graph VI.5). As a result, close coordination between the central bank and the government is necessary to put in place mechanisms to ensure that potential losses do not impair the operational independence of central banks.

Repairing the financial system

Governments intervened to rescue key financial institutions ...

Central bank actions addressed banks' immediate funding needs through the first two stages of the crisis, but the severe market dislocation following the bankruptcy of Lehman Brothers in September called into question the solvency of a number of systemically important financial institutions (see Chapters II and III for details). Given their importance to the functioning of the real economy, governments took action to prevent their collapse and to restore confidence in the financial system. Government support was ultimately

designed to restart the flow of credit to households and businesses and to maintain growth in the real economy.

... but failed to address impaired assets convincingly

The policy response did succeed in averting the collapse of the financial system and in calming the markets. It was less successful, however, in convincingly addressing the impaired assets on banks' balance sheets. That problem could delay the adjustments required to ensure that the financial system can operate efficiently on a sustainable basis and may have exposed taxpayers to potentially larger losses. By May 2009, doubts about the long-term health of major global banks remained, with uncertainty about the potential losses from loan books and other credit exposures making it difficult for banks to raise private capital.

This section describes the main characteristics of the government rescue packages and the market reaction to them. It then assesses the government response in the light of the lessons from the 1990s Nordic crises (see Box VI.B) and concludes with some longer-term concerns raised by the policy interventions.

Characteristics of government rescue packages

Governments guaranteed deposits, facilitated debt refinancing and recapitalised banks

Ad hoc actions in late September to rescue specific banks were followed in October by announcements of comprehensive rescue packages by governments of most leading economies. The announcements were accompanied by statements that no systemically important institution would be allowed to fail. Rescue packages consisted of actions targeting the liquidity and solvency of specific institutions and the functioning of financial markets (Table VI.2). Whereas central banks had provided short-term funding to eligible institutions during the earlier stages of the crisis, governments facilitated access to more permanent sources of funding from stage three onwards by providing deposit and debt guarantees. Governments addressed solvency concerns by recapitalising the banks. In an effort to address impaired assets, governments either purchased assets or provided insurance against unusually large losses on specified portfolios of key institutions. As a last resort, governments

Special measures to stabilise the financial system[1]

	AU	BR	CA	CH	DE	FR	GB	HK	IT	JP	KR	NL	US
Deposit insurance	✓			✓	✓		✓	✓	✓		✓		✓
Restriction on short selling	✓		✓		✓	✓	✓		✓	✓		✓	✓
Capital injections		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Debt guarantees	✓		✓		✓	✓[2]	✓		✓	✓	✓	✓	✓
Asset insurance							✓					✓	✓
Asset purchases	✓		✓	✓	✓		✓			✓			✓
Nationalisation					✓		✓					✓	✓

AU = Australia; BR = Brazil; CA = Canada; CH = Switzerland; DE = Germany; FR = France; GB = United Kingdom; HK = Hong Kong SAR; IT = Italy; JP = Japan; KR = Korea; NL = Netherlands; US = United States. ✓ = yes; blank space = no.

[1] Reflects information up to end-April 2009. [2] Via the Société de financement de l'économie française.

Source: National data. Table VI.2

Box VI.B: Resolving the financial crisis: a message from the Nordic countries

The way that Finland, Norway and Sweden dealt with their banking crises in the late 1980s and early 1990s is widely regarded as "best practice".[1] A comparison of that episode with the current crisis suggests that while the underlying nature of the problems is quite similar, differences in their manifestation have deeply influenced the timing and shape of policy interventions. This box highlights two basic principles for the resolution of banking crises that emerged from the Nordic events and considers how differences in circumstances have influenced to what extent they have been followed.

The main objective of crisis management and resolution is to minimise the costs of financial distress in terms of lost output. There is now a broad consensus around two basic principles that are seen as best practice for crisis resolution. First, the nature and size of the banking problems should be recognised early and intervention should follow quickly. The aim is to avoid a hidden deterioration in underlying asset quality, which could magnify the costs of the resolution. Second, intervention should be in-depth and broad-ranging – that is, after taking the measures needed to stabilise the situation, the authorities should ensure that losses are booked, bad assets are disposed of, the system is recapitalised and any excess capacity is removed. By cleaning up the balance sheets and encouraging adjustment, these policies should restore the ability of the financial system to operate effectively and underpin its long-term profitability, thereby setting the basis for a self-sustained economic recovery.

The specific measures will vary depending on circumstances. Inevitably, they will require the political will to commit public money and the means to exert sufficient control over financial intermediaries through either strict conditionality or public ownership. Those conditions hold management and shareholders responsible, avoid giving supported institutions an unfair competitive advantage, limit the risk of "gambling for resurrection" and contain the costs to the taxpayers. The incentives of incumbent management and shareholders will be to delay recognition and to hold out for the most advantageous terms.

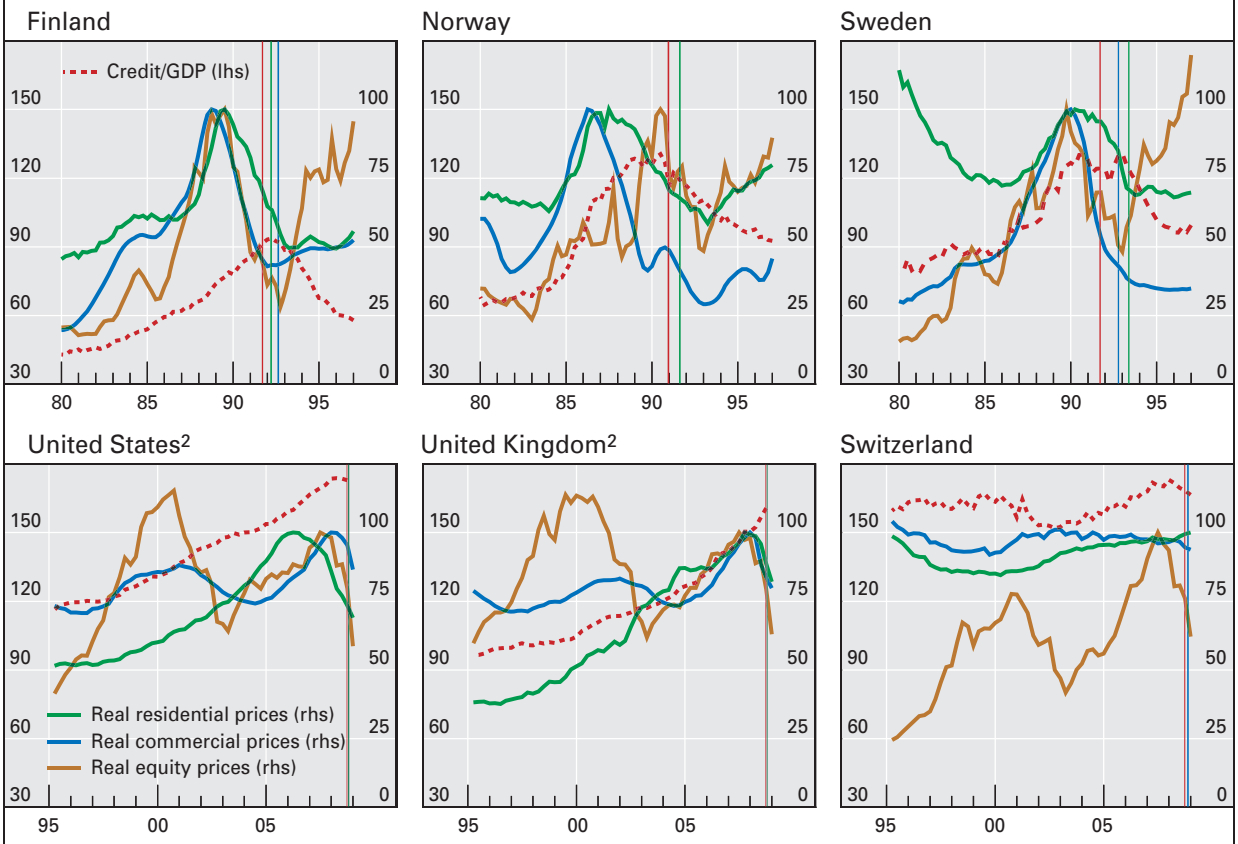
The Nordic crises and today's crisis resemble one another in a fundamental respect: they can be regarded as the result of the reversal of an outsize credit and asset price ("financial") cycle (Graph VI.B). The crises were preceded by an unusually rapid and prolonged increase in the ratio of private sector credit to GDP alongside equally sharp increases in asset prices, especially real estate prices. Indeed, recent work has found that real-time leading indicators based on credit and asset price booms help predict these banking crises well ahead of time.[2]

Although their underlying conditions are similar, the two episodes differ strikingly in the timing of the first systemic events and policy interventions within the financial cycle (Graph VI.B). In the Nordic crises, comprehensive interventions came well after property prices had begun falling. In the current episode, in contrast, the crisis erupted earlier in the down leg of the financial cycle, as illustrated by the experience of the United States and the United Kingdom. Similarly, Nordic banks were closer to book insolvency; in fact, the authorities' intervention was designed partly to raise capital above Basel I minima. In the current crisis, most institutions had capital well above those minima. As a result, in terms of the timeliness of the intervention – the first principle above – the management of the current crisis compares favourably with the Nordic experience.

Arguably, a key reason for the difference in timing reflects accounting practices. The current crisis started as a mark to market crisis: losses were first incurred on securitised claims recorded on a fair value accounting basis; indeed, a large proportion of the losses have been of that kind (Table III.2). The losses in the Nordic crises were recorded on a historical (accrual) accounting basis, following the impairment of loans. Mark to market accounting recognises losses much earlier than accrual accounting: it does not require a clear credit event to trigger recognition. As soon as market participants anticipate a future default, the price of the security falls. Moreover, its decline is typically amplified by rising risk aversion and may be compounded by distressed sales.

Paradoxically, the earlier recognition of losses and timelier intervention have actually complicated crisis management with respect to the second principle of best practice: they have made it harder for policymakers to exert the degree of control necessary to clean up balance sheets. For the most part, marked to market losses have wounded institutions but have not made them objectively insolvent (see Chapters III and VI). This has narrowed the options available to the authorities. For example, it is more difficult to apply strict conditions or enforce writedowns in such circumstances, and the risk of infringing the property rights of shareholders is higher. More importantly, the funding disruptions caused by marked

The financial cycle and banking crises[1]



[1] The asset price series are normalised to 100 by their respective peaks within a window around each banking crisis (for the Nordic countries, 1985–92; for the other countries, 2004–09). The vertical lines denote the following events: red = first systemic event (major failure or rescue); blue = introduction of a debt guarantee scheme; green = generalised bank recapitalisation programme. [2] Introduction of debt guarantee scheme and generalised bank recapitalisation programme on the same date.

Sources: National data; BIS calculations. Graph VI.B

to market losses may have clouded the interpretation of the underlying problems. For a considerable time, what was fundamentally a looming solvency crisis tended to be regarded as a pure liquidity crisis (see Chapter II). It was widely believed that the sharp asset price declines would be temporary and that market functioning and effective intermediation could be restored through central bank liquidity support. However, if the credit cycle follows a pattern similar to previous ones associated with severe banking distress, an overt deterioration in loan books will follow the marked to market losses.

In the interim, there is a risk that the authorities' efforts could focus too much on sustaining credit, asset prices and aggregate demand rather than on encouraging the necessary adjustment in bank balance sheets. The Nordic resolutions required full recognition of losses, the writedown of equity, and a contraction in the balance sheets and branch networks of those banks receiving targeted support. Strict conditionality and public ownership were used to that end. The only exception was a general capital injection in Finland, which was designed partly to restore fair competitive conditions between the resolved institutions and others as well as to support lending capacity. By contrast, the conditions attached to recent packages have generally not sought to encourage adjustment and have even involved increased lending targets to support domestic credit. The risk is that the basis for a self-sustained recovery could be delayed.

[1] For a comparative discussion of the resolution of the Nordic banking crises, see the BIS's *63rd Annual Report*, June 1993, Chapters VII and VIII. [2] The main exceptions to predictability are the banking systems that in the current crisis have suffered problems only as a result of their cross-border exposures, such as those of Germany and Switzerland. See C Borio and M Drehmann, "Assessing the risk of banking crises – revisited", *BIS Quarterly Review*, March 2009.

nationalised insolvent financial institutions to protect depositors and avoid contagion, or they acquired majority equity stakes.

Deposit and debt guarantees protected key sources of financing

By offering greater protection to depositors and bank creditors through guarantees, governments protected key sources of bank financing and facilitated the refinancing of maturing debt (Table VI.2). More than 20 countries introduced or increased guarantees on retail and commercial deposits, reducing the likelihood of bank runs. Government debt guarantees allowed eligible banks to issue new bonds backed by explicit government support in return for an annual fee paid by the issuer. Issuance under these schemes was the primary source of bank bond issuance in the last quarter of 2008 and the first quarter of 2009.

The take-up of government debt guarantees was slower than expected ...

The take-up under government debt guarantee programmes was slower than expected as issuers were deterred by the terms and the costs. The maturities available varied by country, typically from three to five years, with most banks issuing at the longest maturity available. European banks faced higher costs for debt guarantees than did US banks. While the United States charged a flat rate to all borrowers regardless of rating, the cost of European guarantees was linked to past credit default swap (CDS) spreads, making them more expensive for riskier borrowers. In some cases, the cost made guarantees less attractive than shorter-term funding through central bank facilities.

... due to the complexity of these programmes and operational issues

The complexity of these guarantee programmes and the varying treatment across jurisdictions deterred some investors. The risk weighting on government-guaranteed bonds varies across countries, with some regulators treating them as riskless from a capital perspective and others assigning a 20% capital charge. Not all markets accepted guaranteed debt as collateral. Some investors also faced legal or operational restrictions that prevented them from buying this new asset class.

Government capital injections increased bank solvency

Governments recapitalised the banks to reduce their financial leverage and increase their solvency. While the UK Treasury used common shares, most governments bought hybrid securities – such as preferred shares or mandatory convertible notes – that combine the stable income stream of bonds with the potential appreciation of common shares.[3] Hybrid securities may qualify as equity when a bank's regulatory capital ratio is being calculated, but they are not viewed with much confidence by market participants due to their limited ability to absorb losses.

Governments bought mostly preferred shares with lower risk but no votes

Governments bought mostly preferred shares, as these limit the risk of loss to the taxpayer while providing a more attractive dividend stream than common shares. These benefits come at a cost because preferred shareholders typically cannot vote at shareholder meetings, which constrains their ability to influence management. The preferred shares purchased by the United States had the potential for capital appreciation: they included 10-year warrants that provided the government with the option to purchase common stock at a specified price. Comparing the costs and terms of capital injections across countries was difficult, as no two plans looked alike.

[3] Preferred shares are typically non-voting, have a prior claim on dividends over common shares, and take priority over common shares in case of bankruptcy. Convertible notes are a form of bond that can be exchanged for a specified number of common shares in the future at the option of the investor.

Conditions attached to capital injections proved difficult to enforce

Government capital injections came with strings attached. Many countries followed France's example and required banks receiving government support to extend new domestic loans with an associated reporting requirement. While initial US and German capital injections mentioned limits on the payment of common dividends, only the United Kingdom explicitly prohibited common dividends as long as the government's preferred shares remained outstanding. Some conditions proved difficult to enforce due to a lack of precision and an unwillingness or inability to interfere in the management of the banks. For example, many rescue packages outlined general restrictions on executive pay, but governments lacked the votes, the support of the banks' boards and the legal basis to block payments.

Only the Swiss government purchased bank assets ...

A few governments supported key financial institutions by purchasing impaired assets or providing insurance against losses on designated portfolios. The Swiss National Bank (SNB) bought mortgage-related assets from UBS and placed them in a special investment vehicle. The sale reduced UBS's risk-weighted assets, lowering the amount of regulatory capital it must hold against potential losses. While the SNB bears the risk of losses, it also shares in the profits if the assets recover. The United States and Germany announced asset purchase plans, but by May they had not taken any action.

... while the Dutch, UK and US governments provided insurance against losses to selected banks

The Dutch, UK and US governments offered asset insurance to a handful of banks: ING, RBS, Lloyds TSB, Bank of America and Citigroup. Under this scheme, the government assumes a share of the potential losses on a specified portfolio (typically 80–90%) after a first loss amount (or deductible) is absorbed by the bank. In return, the bank pays the government an insurance premium based on the riskiness of the portfolio. By limiting the bank's potential losses, asset insurance reduces the capital it must hold. The government, however, is left with a large potential liability if the assets fall substantially in value.

Insolvent banks were taken under government control

Ultimately, governments in Iceland, Ireland, the United Kingdom and the United States took control of a number of insolvent financial institutions to protect depositors and to prevent contagion to other financial institutions (see Chapter II). This transfer of control was accomplished directly by regulators (in the case of the US government-sponsored enterprises and Icelandic banks) or through a court injunction (in the case of Bradford & Bingley in the United Kingdom and the Belgo-Dutch firm Fortis). In some cases, it was accomplished indirectly by acquiring the majority or entirety of the voting shares (eg AIG and RBS). The legal basis for regulatory takeovers existed in the United States, but new laws had to be passed in Germany and the United Kingdom to facilitate these actions, which otherwise might have been blocked by shareholders. Uncertain solvency and the risk of consequent nationalisation made it virtually impossible for some financial institutions to raise capital because equity investors and creditors feared that their capital might be written down.

Market reaction to rescue packages

Policy interventions did not restore longer-term confidence ...

Government interventions in late September and October 2008 averted bankruptcies at key banks and protected depositors but did not entirely dispel concerns about the health of major global banks. Even though creditors took

comfort from the government support, as seen in a narrowing of credit spreads over government bonds and spreads on CDS contracts, most banks still found it difficult or impossible to raise new capital from private investors (see also Chapter II). As a result, some governments provided multiple capital injections to selected banks between November 2008 and May 2009.

… as seen in falling stock prices

The initial positive reaction in October to the announcement of rescue packages manifested itself in a rise in the price of bank stocks – followed by a drop over subsequent months, suggesting that common shareholders expected more losses. By design, the rescue packages did not protect equity holders, with a moderate decline in bank stock prices expected due to the dilution of existing shareholdings (Graph VI.6, left-hand panel). In all of the six countries covered, bank stock prices underperformed the market following capital injections. The drop in bank stock prices was larger in the United Kingdom than elsewhere due to the prohibition on paying common dividends. Banks receiving government capital injections also underperformed banks that did not receive government support.

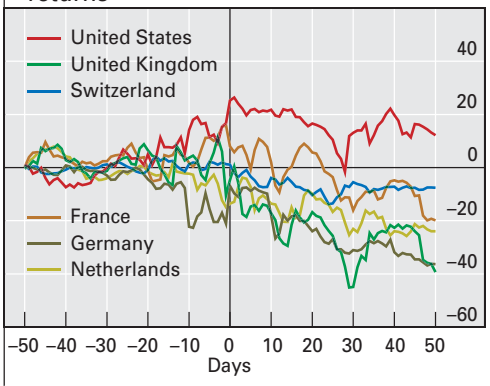
Creditors viewed government support more positively …

Creditors viewed the government actions more positively, as seen in the narrowing of CDS spreads across banks headquartered in different countries (Graph VI.6, right-hand panel). By increasing a bank's capital ratio and providing a means to refinance existing debt, government rescue packages reduced the probability of default, pushing down CDS premia on average. Credit spreads on senior and subordinated bank debt also narrowed relative to underlying government benchmarks. Despite these positive signs, some banks continued to show signs of distress and credit spreads remained elevated. The relatively high credit spreads on bank bonds issued under different government guarantees suggest that creditors harboured doubts about the financial condition of banks and the credibility of public statements that no systemically important institutions would be allowed to fail.

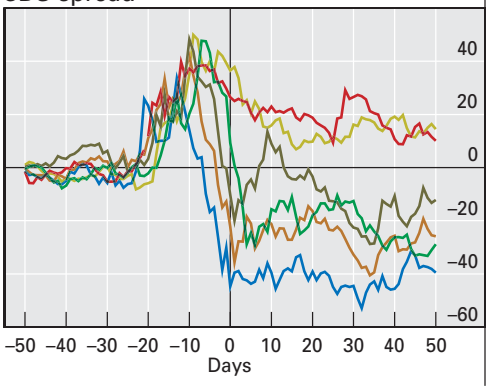
… but credit spreads remained elevated

Market reaction to rescue packages[1]

Cumulative average abnormal stock returns



Cumulative average abnormal change in CDS spread



[1] In per cent; the announcement day 0 is: for the United Kingdom, 8 October 2008; for the Netherlands, 9 October 2008; for France and Germany, 13 October 2008; for the United States, 14 October 2008; for Switzerland, 16 October 2008.

Sources: Datastream; Markit; BIS calculations. Graph VI.6

Assessment of policy response

Governments are struggling to deal with impaired bank assets

Overall, governments may not have acted quickly enough to remove problem assets from the balance sheets of key banks. The 1990s experience of the Nordic countries indicates that addressing problem assets is necessary to reduce uncertainties, re-establish confidence in a lasting way and lay the basis for an efficient financial system (see Box VI.B). Despite acknowledging these lessons, the steps taken so far have focused largely on providing guarantees and subsidised capital. At the same time, government guarantees and asset insurance have exposed taxpayers to potentially large losses. Progress on problem assets has been slowed by the complexity of the securities affected, legal constraints and, above all, the limited political will to commit public funds to the clean-up effort. The lack of progress threatens to prolong the crisis and delay the recovery because a dysfunctional financial system reduces the ability of monetary and fiscal actions to stimulate the economy.

The lack of progress on removing troubled assets from the banks' balance sheets and recognising the associated losses is illustrated by the US experience. Rather than buy impaired assets directly, the US Treasury outlined a plan in March, the Public-Private Investment Program (PPIP), to value these assets and to remove them through an auction mechanism. Under the PPIP, eligible private sector investors are invited to bid on troubled real estate assets held by banks. Winning bids receive matching government capital and non-recourse funding on attractive terms, with the US government assuming any losses beyond the equity invested. The generous terms were designed partly to boost the value of the underlying securities, to provide sufficient incentives for private capital inflows and to attract expertise to value and manage these assets. Despite the favourable terms, as of May 2009 the outlook for the PPIP was uncertain.

US regulators conducted stress tests on the 19 largest banks

To increase confidence in the banks, US regulators conducted stress tests on 19 bank holding companies in April 2009 to ensure that they were sufficiently capitalised given a set of assumptions about losses on various bank assets over the next two years. Following the release of the results in early May, US regulators directed 10 of the banks examined to increase their level of capital or to improve the quality by including more common shares. Several banks took advantage of the reduced uncertainty and the increased risk appetite of investors that accompanied the publication of the stress test results to raise equity and issue debt. While the United Kingdom conducted a similar exercise, other European countries were still debating the merits of an EU-wide stress test.

As the crisis continues, loan losses and credit defaults are rising

What seems clear is that the deterioration in credit quality will generate more losses on banks' loan books and other credit exposures (see Chapter III). Banks may therefore have an incentive to delay recognising losses, aided by accounting rules that provide management more discretion over when to write down assets. Taxpayers will not want to be exposed to greater potential losses, but key financial institutions are likely to require more government support in order to facilitate the required adjustments, to restore confidence in the financial system and to restart lending on a sustainable basis.

Longer-term considerations

Government actions to support banks raise a number of longer-term concerns.

Short-term responses may conflict with medium-term objectives

First, policymakers need to consider the trade-off between short- and medium-term objectives. Short-term actions that delay adjustment and prop up aggregate demand may not be compatible with the medium-term need for banks to deleverage their balance sheets so as to lay the basis for a healthy financial system and a self-sustaining recovery.

Moral hazard is a longer-term concern

Second, rescue packages for banks deemed too big or too interconnected to fail raise questions of moral hazard. Given the perceived need to avoid the bankruptcy of major financial institutions post-Lehman, moral hazard concerns were viewed as a necessary risk. But by protecting creditors and limiting the losses of equity holders, government interventions risk reducing the incentive for capital providers to monitor banks in the future. At the same time, senior bank executives and traders who reaped the rewards from risk-taking may not be held sufficiently accountable for the losses.

Bank bailouts may increase systemic risk in the future

Third, rescue packages and government-assisted sales of failed banks may unwittingly increase systemic risk by creating larger financial institutions. In the United States, for example, the Federal Reserve's loan to JPMorgan Chase facilitated the takeover of Bear Stearns in March 2008. Then, in September 2008, the FDIC arranged for the sale of Washington Mutual's banking subsidiaries to JPMorgan Chase. In the United Kingdom, the government sold the retail operations of Bradford & Bingley to Banco Santander, one of the largest euro area banks in terms of assets. More examples of such actions can be seen in other countries. As discussed in Chapter VII, large financial institutions pose disproportionate systemic risks.

Uncoordinated responses across countries distort competition

Finally, the uncoordinated response across countries has raised concerns about distortions to competition. In particular, national rescue packages have featured different conditions, coverage and cost, with some banks receiving support on more attractive terms than their competitors. The European Commission reviewed the rescue measures of EU member states to avoid undue distortions of competition, but other national plans did not undergo the same scrutiny. This lack of global coordination risks creating an uneven playing field for global banks. In addition, government support that has been explicitly tied to domestic lending may inadvertently contribute to the retreat of global banks from foreign markets (see Chapters III and V).

Fiscal policy plans to stimulate aggregate demand

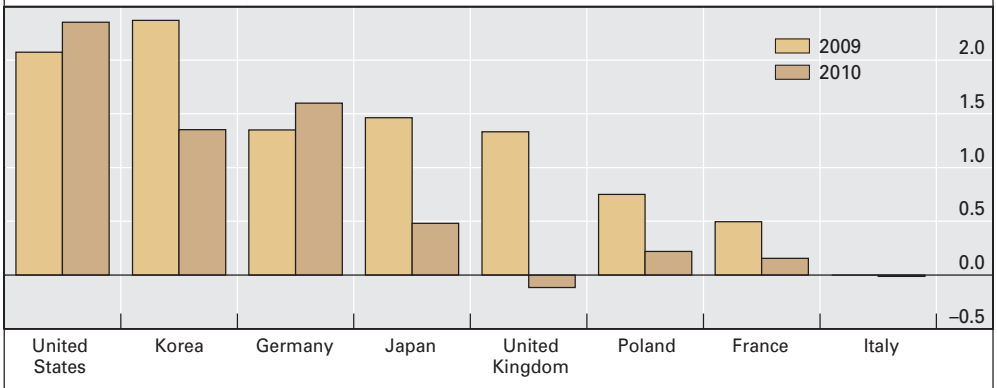
Fiscal policy measures as the last resort

By late 2008, with the crisis moving into its fourth stage, concerns were arising that monetary policy might not be sufficient to avert a sharp contraction in output. Similarly, while bank recapitalisation packages and government guarantees arguably prevented the collapse of the financial system, they were seen as insufficient to lift economic activity in the short term. Against this backdrop, authorities in all major economies turned to fiscal measures to stimulate aggregate demand and thus soften the downturn. By May 2009, almost all OECD economies, and many non-OECD emerging market economies, had announced fiscal stimulus packages.

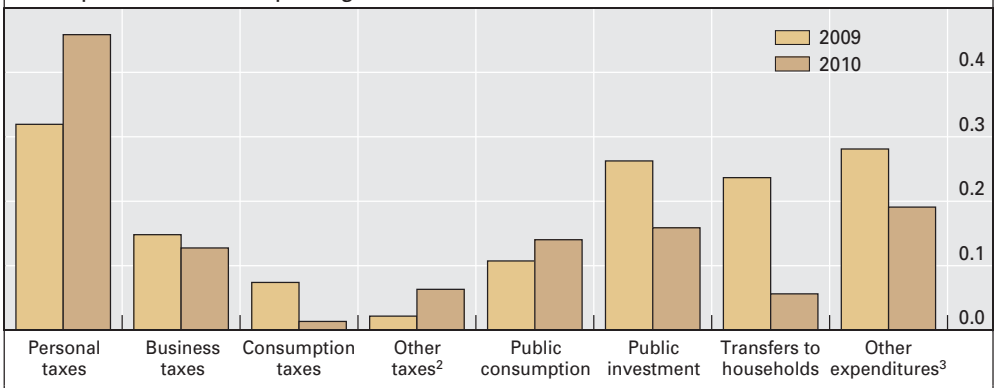
Fiscal packages in OECD countries

Estimated fiscal costs as a percentage of 2008 GDP

Size of fiscal packages by country[1]



Composition of fiscal packages



[1] Comprises revenue and spending measures in response to the financial crisis and excludes the potential impact on fiscal balances of recapitalisation, guarantees or other financial operations. [2] Mostly contributions for public pensions, unemployment, health care, invalidity, etc. [3] Mostly transfers to businesses and to sub-national governments.

Source: OECD, *Economic Outlook Interim Report*, March 2009. Graph VI.7

Package sizes reflect the prevalence of automatic stabilisers

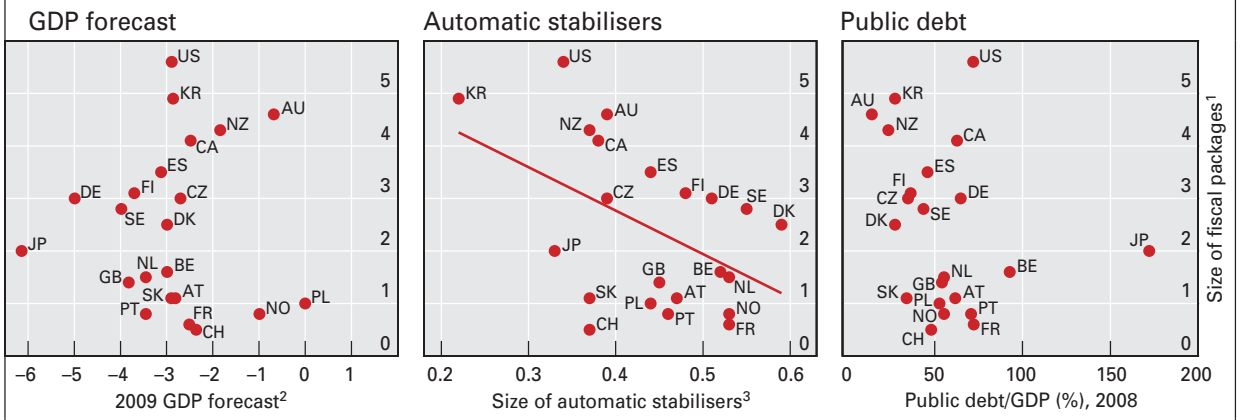
The size of announced fiscal packages varied greatly across countries. Among OECD economies, the United States announced the largest package, with estimated fiscal costs of well over 2% of GDP in both 2009 and 2010 (Graph VI.7, top panel).[4] The relative size of the packages is not positively correlated with differences in the severity of the downturn across countries (Graph VI.8, left-hand panel). A much bigger role is played by the relative importance of automatic stabilisers, which explains about one fifth of the variation in the size of fiscal packages across OECD members (Graph VI.8, centre panel).

Change in the deficit as a measure of fiscal stimulus

The importance of automatic stabilisers in many economies suggests that discretionary packages should not be viewed in isolation. A better measure of the overall stimulus is the change in the government's expected near-term budget balance in response to the crisis, which also captures

[4] Some of the fiscal stimulus packages announced in non-OECD economies were even larger relative to GDP than that in the United States. However, the actual "new" stimulus is often substantially smaller than the headline figures suggest, as these may include expenditure that has already been committed or contingent liabilities. Such items are excluded from the OECD figures.

Need and scope for discretionary fiscal stimulus



AT = Austria; AU = Australia; BE = Belgium; CA = Canada; CH = Switzerland; CZ = Czech Republic; DE = Germany; DK = Denmark; ES = Spain; FI = Finland; FR = France; GB = United Kingdom; JP = Japan; KR = Korea; NL = Netherlands; NO = Norway; NZ = New Zealand; PL = Poland; PT = Portugal; SE = Sweden; SK = Slovakia; US = United States.

[1] Total ex ante cost of discretionary fiscal packages over the period 2008–10, as a percentage of 2008 GDP. [2] Forecast made in May 2009. [3] Coefficient summarising the automatic change in the fiscal balance due to a 1 percentage point change in the output gap.

Sources: N Girouard and C André, "Measuring cyclically-adjusted budget balances for OECD countries", *OECD Economics Department Working Papers*, no 434, 2005; OECD, *Economic Outlook Interim Report*, March 2009; © Consensus Economics. Graph VI.8

expenditures (and revenues) related to the financial rescue packages as well as the revenue deterioration resulting from the drop in asset prices. The fiscal impulse is determined by the sum of the various components, not by a single component.

Sharp widening in deficits

Budget deficits are expected to reach levels far beyond those anticipated prior to the intensification of the crisis in September. Both the structural and the cyclical balance are forecast to widen markedly (Graph VI.1, bottom panel). In its March 2009 projection, the OECD predicted a US deficit in 2009 of 10% of GDP compared with about 5% in its mid-2008 projection. Fiscal policy in France, Germany, Japan and the United Kingdom also expanded strongly. In Italy, the structural balance remained more or less unchanged in the absence of a sizeable discretionary package, while the automatic stabilisers increased the cyclical deficit.

Limited room for manoeuvre ...

The capacity for fiscal stimulus varies considerably across countries. Countries with a high degree of public indebtedness, sizeable budget deficits even in the absence of discretionary stimulus, or a high level of unfunded liabilities have less room for manoeuvre than those with healthier public finances. So far, however, such constraints do not appear to have affected the decision of the major economies to provide fiscal stimulus: there is no significant relationship between the size of the packages and the level of outstanding government debt among OECD countries (Graph VI.8, right-hand panel). Moreover, financing costs have generally declined despite the sharp widening in budget deficits (Graph VI.9, bottom panel). The exceptions include some smaller economies with very large budget deficits or crisis-related expenditure, such as Hungary, Iceland and Ireland, that experienced significant problems in placing public debt and were forced to tighten fiscal policy in stages three and four of the crisis.

... only in smaller economies with less favourable fiscal positions

The composition of stimulus packages raises questions about effectiveness

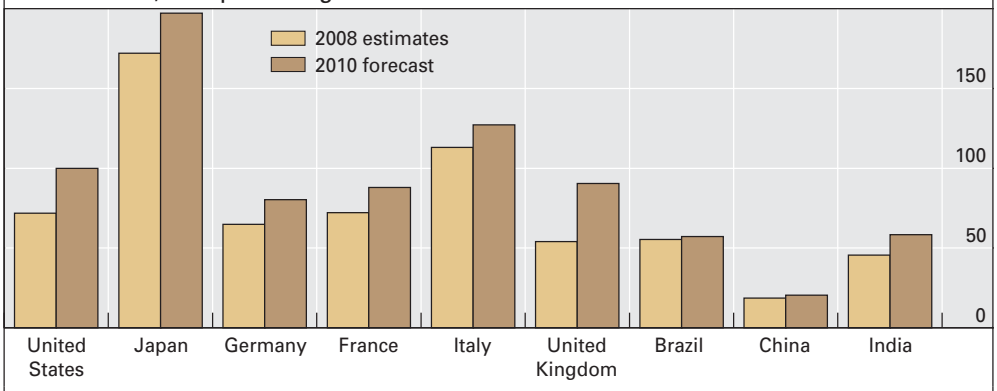
Approaches to fiscal stimulus differ, although most packages include tax cuts as well as increases in government spending (Graph VI.7, bottom panel). Tax cuts tend to have a lower impact on output than measures targeted at low-income (and thus presumably low-saving) households. Nonetheless, several factors led fiscal authorities to include such instruments in their recent stimulus packages. Some were political: it is easier to mobilise large amounts of funds if spending benefits a broad range of taxpayers. Others were economic: tax cuts can be enacted relatively quickly, whereas increasing government spending often involves significant delays. In addition, cuts in personal taxes may support the deleveraging of the household sector, and thus speed up the recovery further down the road, even if the short-term impact on GDP is small.

Uncertainty about fiscal multipliers

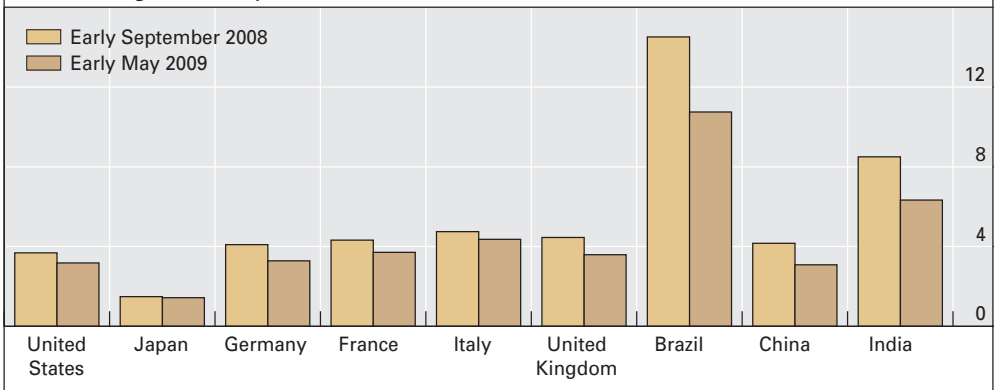
While fiscal packages have undoubtedly been large by historical standards, will they also be effective? Estimates vary. For example, based on previous average experiences, the US Congressional Budget Office (CBO) expects the American Recovery and Reinvestment Act (ARRA) – the bill carrying most of the fiscal stimulus measures – to lift GDP growth by 1.4 to 3.8 percentage points in 2009 and by a somewhat lower amount in 2010. The lack of precision in these estimates reflects the wide range of fiscal multipliers

Fiscal positions and borrowing costs

Public debt, as a percentage of GDP[1]



Borrowing costs, in per cent[2]



[1] Gross debt of general or central government. [2] Average yield of 10-year government bonds (for Brazil, three-year government bonds); refers to the first two weeks of the month.

Sources: OECD; Bloomberg; JPMorgan Chase. Graph VI.9

in the literature.[5] However, it is unclear whether econometric estimates based on samples with functioning financial systems provide any useful information at the current juncture on the impact of fiscal stimulus. On the one hand, financial stress is likely to increase the proportion of households and firms without access to credit, and as a result they may spend a higher proportion of the additional income. On the other hand, high uncertainty might induce households and firms to reduce their debts or save more, thus depressing the multiplier.

Risks

The effectiveness of expansionary policies ...

An open question as of this writing is whether the expansionary set of policies enacted in response to the sharp contraction in economic activity in late 2008 and early 2009 will succeed in stabilising the economy. A major cause for concern is the limited progress in addressing the underlying problems in the financial sector. The experience of the Nordic countries in the 1990s (see Box VI.B) and other historical episodes suggest that a precondition for a sustainable recovery is to force the banking system to take losses, dispose of non-performing assets, eliminate excess capacity and rebuild its capital base. These conditions are not being met. A significant risk is therefore that the current stimulus will lead only to a temporary pickup in growth, followed by protracted stagnation. Moreover, a temporary respite may make it more difficult for authorities to take the actions that are necessary, if unpopular, to restore the health of the financial system, and may thus ultimately prolong the period of slow growth.

... may be undermined by a weak financial system

Risk of a forced exit

Perhaps the largest short-term risk associated with the expansionary policies is the possibility of a forced exit. Monetary and fiscal authorities of the major economies have so far been relatively unconstrained in their ability to follow expansionary policies. This need not last. An extended period of stagnating economic activity could undermine the credibility of the policies in place. Governments may find it hard to place debt if market participants expect the underlying balance to remain negative for years to come. Under such circumstances, funding costs could rise suddenly, forcing them to cut spending or raise taxes significantly. External constraints could also bind for some countries. Particularly in smaller and more open economies, pressure on the currency could force central banks to follow a tighter policy than would be warranted by domestic economic conditions.

The transition to a new economic structure

Another set of risks concerns the medium term. While the immediate objective of policymakers was to cushion the steep downturn in the economy, the expansionary policies undertaken in late 2008 and early 2009 will also affect the transition towards a more sustainable economic structure with less leverage and thus a smaller financial sector. Some smoothing of this adjustment is clearly welcome, but correction of the imbalances identified in Chapter I

[5] Structural macroeconomic models with backward-looking expectations generally give multipliers larger than 1, which means that one dollar of fiscal outlays leads to an increase in GDP of more than one dollar. By contrast, more forward-looking models and event studies suggest multipliers that are generally smaller than 1, as higher fiscal outlays are offset by lower spending elsewhere in the economy.

cannot be delayed indefinitely. To be credible, policymakers must recognise this fact.

Tightening should not pose technical problems ...

At some point the economy will recover and monetary and fiscal easing will have to be reversed. From a technical point of view, this is straightforward. Selling the large asset holdings accumulated by central banks since the Lehman bankruptcy will take time, but this does not compromise central banks' ability to reduce monetary stimulus. Even if central banks are not able to shrink their balance sheets, they can withdraw liquidity through repurchase operations or the issuance of central bank bills or by making it more attractive for banks to hold reserves. As discussed above, several of these measures have already been used during the crisis to offset at least some part of the expansion in central bank balance sheets. Reversing the fiscal stimulus should also be relatively straightforward. Some of the measures have been designed to be temporary and will expire eventually unless extended. Other measures do not have set expiry dates but could be reversed in the course of the normal budgeting process.

... but timing the exit is difficult

The absence of major technical problems in withdrawing monetary and fiscal stimulus does not mean that tightening policy will be easy. First, there is a timing problem. Tightening too early could thwart the recovery, whereas tightening too late may result in inflationary pressures from the stimulus in place or contribute to yet another cycle of increasing leverage and bubbling asset prices. Identifying when to tighten is difficult even at the best of times, but even more so at the current stage. Standard measures of the output gap are probably of limited use in this regard, since it is not clear to what extent the problems in the financial sector will reduce future potential output. The second major problem is political. Both central banks and treasuries are likely to face strong political pressures to delay any tightening.

Risk of fiscal overextension

While their effectiveness remains in doubt, the expansionary policies put in place in 2008 and 2009 will nonetheless have long-term consequences, the most important stemming from the large amount of public debt they will generate. Even if stimulus measures are reversed quickly, the commitments from financial rescue packages could affect the public purse for years to come, while lower asset prices are likely to depress revenues. Higher public debt in turn may push up real interest rates and thus crowd out private investment. To return to the case of the US stimulus package, the CBO estimates that the package will lower future growth by 0.2% of GDP per year in the long term. Getting public finances in order will therefore be the main task of policymakers for years to come.

VII. Risks and opportunities: towards a fail-safe financial system

In the fourth quarter of 2008, despite more than a year of bold efforts by policymakers, the financial crisis intensified to the point where it overwhelmed the real economy. Central banks had been supplying short-term funding to smooth needed adjustments in the banking system, but that alone cannot stem bank losses. And what had been addressed as a liquidity crisis was confirmed to be a solvency crisis. The bankruptcy of Lehman Brothers on 15 September triggered a run in the interbank lending market, a dramatic spike in corporate bond rates and a global loss of consumer and business confidence. The resulting collapse of consumer durables spending in the industrial economies was quickly felt in the emerging world through both a sharp drop in trade volumes and a reversal of capital flows. The global spread of the recession fed back into financial markets, driving down both equity and bond prices, sparing only the highest-quality sovereign debt.

The dramatic developments of the last three and a half months of 2008 forced monetary, fiscal and regulatory authorities to open a second front in their battle – countering the threats to the real economy – and expand their fight to restore the health of the financial system. In much of the industrial world, central banks cut policy interest rates to record lows and then moved to ease financial conditions even further by using their balance sheets in unconventional ways. Meanwhile, fiscal authorities worked to implement unprecedented stimulus programmes while, together with regulators and supervisors, they provided resources to repair financial institutions' balance sheets.

The result has been an inevitably messy mixture of urgent treatment designed to stem the decline combined with an emerging agenda for comprehensive reform to set the foundations for sustainable growth. But two enormous risks to long-term recovery lurk amid the massive short-term efforts. First, policy actions taken so far may be insufficient to restore the health of the banking system. Second, a lack of well articulated exit strategies for the monetary, fiscal and financial repair programmes threatens to hinder rather than support necessary macroeconomic adjustments.

A healthy financial system is not only essential for stable long-run real growth, but is also a precondition for the effectiveness of the expansionary policies intended to return the economy to that path. Until the intermediation system is working again – smoothly channelling resources from savers to investors and transferring risk to those willing and able to bear it – large-scale fiscal stimulus could easily come to naught, as it did in Japan a decade ago. The result would be a massive build-up of public debt without a return to robust growth. It is, therefore, of paramount importance that governments persevere in repairing the financial system. Stopping prematurely will be tempting. At some point, possibly soon, the real economy will show signs of

returning to normal. This will create the hope that renewed economic growth will finish the job of repairing bank balance sheets. But as long as the financial intermediaries remain weak, any improvement in the real economy is destined to be temporary.

To address the threat to growth posed by the constellation of fiscal, monetary and regulatory interventions, officials must find convincing ways to unwind the policies they have put in place, including reducing the now vast involvement of the government in the financial system. Where central banks have stepped in for private sector intermediaries, they need to exit. And the increased government spending that may have been necessary to limit the decline in employment and production in the short term will, if overdone, do more harm than good. It is essential that fiscal policymakers demonstrate now that the paths of their budgets are consistent with long-term sustainability.[1]

Beyond the near-term challenges – nursing financial institutions and markets back to health, ending the recession and restoring balance to the government's role in the economy – lies the daunting task of modifying both the broader policy framework and the architecture of the financial system. Addressing the multitude of causes of the crisis described in Chapter I clearly requires a comprehensive set of solutions. Macroeconomic policies that led to sustained current account imbalances and low interest rates will need to adjust. And asset prices and credit growth must be more directly integrated into monetary policy frameworks. Addressing the wide-ranging microeconomic factors that contributed to the crisis – poorly structured incentives and inadequate corporate governance, flawed risk management and weaknesses in regulatory systems – requires correspondingly broad changes to the set of rules within which markets operate.

For all their enduring virtues, markets have failed in some very important ways. It is now apparent that as the financial system has grown and become more complex, it has come to need a more comprehensive set of rules to ensure that it functions smoothly.[2] Ensuring that the decentralised financial system operates safely and efficiently does not simply mean *more* regulation or *more* centralisation; rather, it means *better* regulation and *better* supervision that induce the private sector to improve incentives, risk management and governance. Moreover, the crisis revealed system-wide, or systemic, risks associated with the principal components of the financial system – instruments, markets and institutions. By identifying, measuring and mitigating the systemic risks inherent in all three components of the financial system, we will be able to establish a robust regulatory perimeter with multiple layers of protection against future crises.

[1] See H Hannoun, "Long-term sustainability versus short-term stimulus: is there a trade-off?", speech at the 44th SEACEN Governors' Conference, Kuala Lumpur, 7 February 2009.

[2] As John McMillan notes, individual incentives and self-regulation go only so far. The existence of an underground economy proves that markets can self-organise but only when transactions remain small and simple. Moving beyond the black market requires rules and a rule-maker. That is where the government steps in to protect property rights and ensure that people live up to their promises. See J McMillan, *Reinventing the bazaar: a natural history of markets*, W W Norton, 2002.

Near-term risks and exit strategies: financial repair, fiscal policy and monetary policy

The fiscal and monetary policies put in place to address the crisis worldwide are unprecedented in both scale and scope. Fiscal stimulus is expanding at high speed as the G20 countries implement new spending of 2% of GDP on average this year, adding to the effects of automatic stabilisers already in place. In the lead is the United States, whose federal deficit is expected to widen by more than 8% of GDP from 2008 to 2009.

Meanwhile, monetary authorities in the euro area, Japan, the United Kingdom and the United States are employing both conventional and unconventional policy tools, lowering policy interest rates to zero (or close to it) while rapidly expanding their balance sheets. As described in Chapter VI, the Eurosystem's consolidated balance sheet has increased from €1.2 trillion to €1.8 trillion over the past two years; the Bank of England has more than doubled its balance sheet, to more than £200 billion, with further large increases planned over the coming months; and the Federal Reserve, whose balance sheet stood at $900 billion in mid-2008, may expand it to more than $3 trillion during 2009.

Fiscal authorities, regulators and central banks have joined forces in the difficult task of repairing the financial system. While there has been some progress, as discussed in Chapter VI, the job is not finished. Further delay in repairing the financial sector runs the risk of weakening the efforts on other policy fronts. Fiscal and monetary policies are surely less effective when financial intermediation is impaired. And as long as global financial institutions are hesitant to finance economic activity in emerging market economies, the prospects for growth and development in what has been the primary engine of worldwide expansion over the past decade is at risk.

The unprecedented rescue efforts carry substantial risks. Enumerating them will serve as a reminder of the pitfalls that policymakers face in the coming months and years as they work to restore stability to the global economic and financial system.

The risks of financial repair: rescues

The financial rescue programmes – the guarantees, transfers of assets, recapitalisations and outright government ownership – present challenges for both effectiveness and exit.

Past banking crises have taught us that early recognition of losses combined with quick, comprehensive intervention and restructuring is the key to a speedy recovery (see Box VI.B). Before normal lending can resume, bad assets must be disposed of and banks recapitalised, all in a transparent fashion. In contrast, during this crisis, resolution has proceeded slowly, with the result that market participants have been unsure about the size and distribution of losses as well as about the timing of loss recognition. This uncertainty has served only to prolong doubts and frustrate government efforts to restore confidence in the financial system.

Besides the need for more forceful government efforts to clean up insolvent banks, intermediaries themselves will need to adjust their funding models as

off-balance sheet entities are consolidated onto bank balance sheets, securitisation becomes more difficult, and wholesale funding becomes more costly. In the end, institutions are likely to be smaller, with less leverage, and their owners will almost certainly have to learn to live with lower rates of return.

In failing to come to grips with the basic process of cleaning up the banks, government subsidies and control of banks have placed a burden on the public treasury at the same time that they have created an uneven playing field both within and across countries. The distortions have caused previously well managed, healthy banks and other creditworthy borrowers to be penalised because they now look risky relative to institutions that are government-subsidised or controlled. Ultimately, the reluctance of officials to quickly clean up the banks, many of which are now owned in large part by governments, may well delay recovery.

The banks must resume lending, but they must also adjust by becoming smaller, simpler and safer. Again, even where they have been essential, the government rescue packages implemented so far appear to be hindering rather than aiding this needed adjustment. By helping banks obtain debt financing and capital, rescue packages allow managers to avoid the hard choices needed to reduce both the size of their balance sheets (lowering leverage) and the amount of risk that they take (shifting the composition of the assets they hold). And by aiding the sale of distressed banks to other banks, as has been typical of many past crisis responses, government actions are creating financial institutions so big and complex that even their own management may not understand their risk exposures. Despite the nearly universal concern over the mere existence of institutions that are too big to fail, short-run government actions are increasing financial sector concentration and adding to systemic risk.

Appropriate exit from the various national rescue programmes clearly depends on the form of support offered in the first place. Sunset clauses on increased deposit insurance and bond guarantees can ensure that they eventually disappear; and since the terms of government capital injections are often punitive, banks have an incentive to repay quickly. The most difficult case involves nationalised or quasi-nationalised banks. Even if such institutions are cleaned up and sold quickly, governments may be left holding bad assets for some time.

Summing up, it is essential that authorities act quickly and decisively to repair the financial system. The determination to finish the job, as well as the conditions and timing for exit, must be clear. In the same way that central banks must allow financial markets to recover their role, government officials need to take decisive steps to restore institutions to private ownership and control. And all of this has to be done with an eye towards returning to a system with healthy competition.

But while government exit is essential, there is the risk that officials will fail to finish their repair task. Even in the face of what might appear to be the first signs of recovery in the real economy, officials must persevere until the job is done. In reviving the financial system, the risk is not one of doing too much but of stopping too soon.

The risks of financial repair: bank regulation

In pursuing the medium-term goals of reforming the regulation of banks, officials are seeking to enhance the management of regulatory capital and liquidity, introduce simpler measures of leverage, and improve the assessments of more complex risk. Beyond all of that, they are confronting a crisis-born threat to cross-border banking.

Investors have become extremely risk-averse in their assessments of financial institutions and are demanding more capital and higher levels of common equity (in relation to both total assets and risk-weighted assets) than the regulatory minimum.

As discussed in Chapter VI, the pursuit of short-term stability has raised some difficult questions about moral hazard. By limiting the losses of large banks' equity and liability holders as well as the rewards of managers and traders, rescue packages are reducing the incentive for both insiders and outsiders to monitor risk-taking in the future.

In the area of risk assessment, officials might be adding to the problem at the same time that they are trying to solve it. That is, as just noted, rescue packages are building up financial sector concentration and systemic risk even as reforms in regulatory policy seek to make those risks more manageable. Fortunately, officials in many countries understand all of this and are looking for solutions. The truth is that as financial institutions grow more complex, the demands on risk management grow much more quickly. A large, integrated financial institution today has hundreds of subsidiaries, all operating quasi-independently; it is impossible for any individual to understand what all the parts of such an organisation are doing, much less how they will interact in response to a major event. Enterprise-wide risk management would seem to be an impossibility in such cases. Moreover, some banks are not only too big to fail but, in having important relationships with a large number of other institutions, are also too interconnected to fail. Officials must insist that institutions be comprehensible both to those who run them and to those who regulate and supervise them. And, in the future, a financial firm that is too big or too interconnected to fail must be too big to exist.

Related to complexity is nationality. Global banks have operations in dozens of countries – on its website, Citigroup lists locations in exactly 100. The existence of global intermediaries enhances the efficiency of the financial system. By reducing the need to have lenders located physically near borrowers, international banks facilitate trade in goods and services as well as the cross-border movement of capital. But after seeing foreign-owned banks pare back activity during the crisis, host country governments may become less sanguine about allowing outsiders to operate on their soil. The result could very well be a greater role for host country supervisors in protecting their financial systems from the possibility of hasty exits by foreign banks. And, by reducing the ease with which capital moves across borders, financial protectionism would shrink trade in goods and services and thus moderate growth and development.

In summary, as officials look forward they need to balance stability with efficiency. Reducing moral hazard, keeping institutions simple and small, and

reducing their international reach will all come at the expense of economies of scale and scope. In the end, a safer and more stable financial system may very well be a less efficient one. Hence it is critical that policymakers work to build a system that is as efficient as possible for the maximum tolerable level of risk they choose.

Fiscal policy risks

Turning to fiscal policy, the short-term efficacy of stimulus plans is hampered, not only because of the impaired financial system, but also because the need for expansionary programmes and the capacity for them vary by country. Moreover, longer-term risks associated with exit and sustainability arise from the sheer size of the spending packages.

A country's need for fiscal expansion is conditioned, in part, by how much actual stimulus can be derived from a given level of expansion. Effectiveness – the growth and employment effects from a fiscal expansion of, say, 1% of a country's GDP – differs across countries for at least two reasons: variations in economic structures and variations in the composition of packages' taxes, expenditures and subsidies.

A country's capacity for fiscal expansion can be measured by its pre-existing level of debt relative to GDP. In most large industrial economies, the ratio going into the crisis stood at 60 to 70% (France, Germany, the United Kingdom and the United States). In others, such as Italy and Japan, debt exceeded GDP, so such countries would seem to have much less room for fiscal manoeuvre. As discussed in Chapter VI, for most countries these differences do not appear to have affected the ability to borrow so far. But, as they proceed, the fiscal expansions could quickly start to increase borrowing costs.

Fiscal policy is at serious risk of overshooting even in the economies with the most room for debt expansion. A fundamental reason is that, while the programmes most likely to be highly effective and low-risk are *timely*, *targeted* and *temporary*, those attributes of fiscal action are notoriously rare in representative democracies. The legislative process and the logistical challenge of disbursing enormous sums of money work against timeliness. Targeted programmes are the most likely to increase aggregate spending but are politically less attractive than those that simply benefit the most people. And it is much easier to lower taxes and increase spending than to do the reverse, so fiscal expansion tends towards permanency and a rise in long-term deficits.

The large stimulus packages also pose a variety of medium-term risks that policymakers must worry about now. On the one hand, there is the danger that fiscal policymakers will exhaust their debt capacity before finishing the costly job of repairing the financial system. On the other hand, there is the definite possibility that stimulus programmes will drive up real interest rates and inflation expectations. Those risks may appear small today – the crisis is boosting private saving and suppressing private investment, and there is substantial excess productive capacity – but once conditions normalise, they will intensify. The consequences could be sudden increases in interest rates combined with large moves in exchange rates.

Fiscal deficits can drive up real interest rates in a manner related to the classic process of crowding-out, whereby higher government purchases of goods and services result in lower private investment. The experience of the past few decades suggests that a permanent 10 percentage point increase in the worldwide ratio of government debt to GDP would raise the real interest rate nearly 0.4 percentage points in the long run.[3]

Fiscal deficits can drive up inflation expectations as well. Although governments rarely refuse to pay their debts,[4] they can lower the burden by altering repayment terms or, as occurred in the aftermath of the Second World War, by engineering previously unexpected inflation.[5] Since bondholders know all of this, even a hint of improvement in the real economy could cause nominal interest rates to increase, steepening the yield curve dramatically and smothering the nascent recovery. And adjustments of international investment portfolios that increase exchange rate volatility could accompany the sudden rise in long-term nominal interest rates.

There is another route through which fiscal stimulus programmes could raise long-term nominal interest rates. As noted in Chapter VI, extended real stagnation could undermine the credibility of fiscal policies to facilitate recovery. Persistent low growth could lead to a consensus that government deficits will remain large for years to come. If that were to happen, investors and institutions could sour on the prospects of holding long-term sovereign debt. Interest rates would then rise, driving up funding costs. Returning policy to a sustainable long-run path would require swift reductions in spending and increases in taxes. The rise in sovereign spreads seen already and the recent threats of credit rating downgrades for industrial economies are signs that a rapid increase in long-term nominal interest rates is a significant risk.

So, although expansionary fiscal programmes are essential to cushion the impact of the global recession and provide a bridge to recovery, it is vital that governments design stimulus in a manner consistent with long-run sustainability. That means that, as officials try to revive real activity and credit flows, they must (1) build in credible provisions for self-liquidation of the programmes and (2) engineer an economic adjustment to more saving and less overall debt.

Regarding self-liquidation, it is straightforward to design a programme that winds down automatically as employment returns to trend. But credibility is a problem – what are inherently political promises that are made now can easily be broken later. Nevertheless, where possible, programmes put into place need to be sustainable, and, if they are not, the commitments to liquidate them need to be structured so that they are difficult to escape.

As for adjustment, recall that the accumulation of debt on household and financial institution balance sheets played a central role in the crisis. For the economy to return to a stable growth path, the amount of borrowing must fall,

[3] See C Freedman, M Kumhof, D Laxton and J Lee, "The case for global fiscal stimulus", *IMF Staff Position Note*, no SPN/09/03, March 2009, www.imf.org/external/pubs/ft/spn/2009/spn0903.pdf.

[4] See C Reinhart and K Rogoff, "This time is different: a panoramic view of eight centuries of financial crises", *NBER Working Papers*, no 13882, March 2008, www.nber.org/papers/w13882.

[5] For further detail, see C Reinhart and K Rogoff, "The forgotten history of domestic debt", *NBER Working Papers*, no 13946, April 2008, www.nber.org/papers/w13946.

which means higher household saving and less leverage in the financial sector. Fiscal policies designed to encourage consumption and borrowing clearly risk hindering this necessary, but difficult, adjustment.

Monetary policy risks

It is fair to say that central bankers are operating well outside their comfort zone. Their unprecedented rate cutting and balance sheet expansion (see Chapter VI for details) pose a myriad of economic risks. On the one hand, their actions may be insufficient to put the economy on the path to recovery; and on the other, central banks may find it difficult to unwind their actions in time to prevent inflation from rising as growth and employment recover.

The consensus view is that, with banks and markets seriously damaged, central banks have had no choice but to take over much of wholesale financial intermediation in the short run. But their balance sheets, which technically could expand without bound, may reach practical and desirable limits before the needs of the economy are met.

And once the recovery materialises, how can central banks begin to tighten policy interest rates and unwind their vast monetary interventions? The technical issues are much less challenging than the political ones. As an operational matter, central banks' now swollen balance sheets need not get in the way of the transition to growth. When the time comes, central banks can tighten financial conditions by raising the policy interest rate or by issuing their own bonds in order to drain excess reserves while retaining assets that cannot be easily sold.[6] So, while holdings of some illiquid assets could easily cause balance sheets to remain large for some time, financial conditions can be tightened in a manner that allows monetary policymakers to retreat gracefully from unconventional policy easing.

But the timing and politics of unwinding are likely to be difficult. History shows that in moving to steady an expansion, monetary policymakers – always under close political scrutiny – have a tendency to be late, tightening financial conditions slowly for fear of doing it prematurely or too severely. Because their current expansionary actions were prompted by a nearly catastrophic crisis, central bankers' fears of reversing too quickly are likely to be particularly intense, increasing the risk that they will tighten too late. The big and justifiable worry is that, before it can be reversed, the dramatic easing in monetary policy will translate into growth in the broader monetary and credit aggregates. That growth will, in turn, lead to inflation that feeds inflation expectations or it may fuel yet another asset price bubble, sowing the seeds of the next financial boom-bust cycle.

Finally, it is essential that central banks end their role as intermediary of last resort. By taking over large swathes of intermediation from moribund markets and institutions, central banks created the risk that the private sector

[6] Regarding the first option, the existence of standing facilities in which commercial banks receive interest on excess reserves facilitates a quick increase in rates. Regarding the second option, an equivalent approach is for the finance ministry or treasury to agree to issue sovereign debt and deposit the proceeds in the central bank. Coordination between the two authorities is essential to accomplish that move because it forces recognition of the link between the central bank's balance sheet policies and fiscal debt management.

will be unable to return to these activities either quickly or smoothly, or to restart them in a new form. Not only must commercial paper and simple forms of securitisation return, but market-makers and arbitrageurs must as well. Any actions officials take to temporarily replace private sector agents must always have the return of those agents as the ultimate objective.

On the political front, central banks perceived the need to quickly move far outside their traditional sphere of influence and so were unable to thoroughly work out the governance implications of their actions. As a consequence, their moves carry important long-term political risks.

One such risk comes from the fact that monetary policymakers have supported selected industries and borrowers at the expense of others, creating an uneven playing field in some areas. Traditionally, central banks have operated in deep markets in an effort to remain impartial and avoid creating price distortions. But in the current environment, what is commonly known as "asset neutrality" is simply not possible.

Another long-term risk is that the extraordinary loan and asset purchase facilities created by central banks have blurred the traditional distinction between monetary and fiscal policy and thus between the actions of central banks and those of governments. Some of the riskier unconventional monetary policy actions may, in the end, generate large losses that will have to be borne by the public. Such losses could unleash a dangerous reaction against the structure of central banking in which appointed officials operate at arm's length from the elected government.

The bottom line: perseverance and sustainability

In summary, financial regulators, fiscal authorities and central bankers face enormous risks. To avoid deepening and prolonging the crisis, they need to act quickly and guard against policies that hinder adjustment or create additional distortions in financial flows. Governments will be tempted to subsidise industries that need to contract – but losers need to be allowed to lose. They will be tempted to encourage banks to lend to those who should borrow less – but it is not possible to deleverage by borrowing. And they will be tempted to turn a blind eye to insolvent institutions, allowing them to continue operating – but as hard experience teaches, zombie banks must be closed or returned to health as quickly as possible. In all of these cases, governments must realise that, by insisting on speedy resolutions despite political controversy, they are acting in the best interests of the public.

Building a more stable financial system

While emergency room doctors focus on saving the patient's life, others work on the patient's longer-term health. The same is true for the financial system now under emergency care: as officials are working to resolve the crisis, they are also striving to build a more stable financial system that will make the next crisis both less likely and less damaging.

Building a perfect, fail-safe financial system – one capable of maintaining its normal state of operation in the event of a failure – is impossible. Standing

in the way are both innovation, necessary for progress, and the limits of human understanding, especially regarding the complexity of the decentralised financial world. Even so, better macroeconomic policies, regulation and enforcement, combined with improved private sector governance and risk management, should be able to produce a more resilient structure. A sound framework for financial stability incorporates both macroeconomic policies designed to lean against asset price booms and credit cycles, and macroprudential policies in which regulators and supervisors adopt a system-wide perspective.

The key to building a framework that makes the financial system more stable and less prone to collapse is to identify its sources of systemic weakness – the aspects that, if damaged, will bring the entire system down. If the reform process can identify and mitigate these systemic risks while giving private agents the incentive to behave responsibly, the system overall will be less prone to failure and more resilient even if major problems occur.

A framework for addressing systemic risk in the financial system

The starting point for building a comprehensive framework that safeguards financial stability is to identify the sources of systemic risk in each of the financial system's three essential elements: *instruments*, including loans, bonds, equities and derivative instruments; *markets*, ranging from bilateral over-the-counter (OTC) trading to organised exchanges; and *institutions*, comprising banks, securities dealers, insurance companies and pension funds among others. All three elements – instruments, markets and institutions – can generate systemic risks that require mitigation if the financial system is to be safe from collapse. And, importantly, addressing risk in only one area will not ensure the safety of the others. Furthermore, making all three parts of the financial system more stable and more resilient to systemic events diminishes the problem of a porous regulatory perimeter. No part of the financial system should be allowed to escape appropriate regulation.

Ensuring financial stability means addressing externalities – costs that, through its actions, an institution imposes on others but does not bear itself. Two externalities are central to systemic risk: the first is joint failures of institutions resulting from their *common exposures* at a single point in time – common exposures because of shocks that come from outside the financial system or because of linkages among intermediaries. The shocks may take a variety of forms, including both credit and liquidity shocks and their interaction, while the linkages arise from the complex web of daily transactions. The second externality is what has come to be known as *procyclicality*, the fact that, over time, the dynamics of the financial system and of the real economy reinforce each other, increasing the amplitude of booms and busts and undermining stability in both the financial sector and the real economy. Properly designed, each component of the framework – focusing on instruments, markets and institutions – can mitigate these sources of instability.

Having identified the sources of systemic risk, the next step is to create institutional mechanisms that enhance safety. These policy interventions must combine outright bans, which should be rare, with regulations that increase the

cost of activities based on the systemic risks they create. The discussion that follows suggests various actions aimed at moderating the systemic risks arising from instruments, markets and institutions, but these three basic elements of the financial system are inextricably linked together (see Chapter III). For example, there is no clear dichotomy between bank-based and market-based intermediation systems; and financial instruments appear in markets as well as on (and off) institutions' balance sheets. So the actions suggested here should be thought of as interrelated.

Improving the safety of financial instruments

The opacity, complexity and sheer quantity of some instruments can lead to systemic problems. The most recent examples of such instruments were the various structured products, including securitised subprime mortgages that were difficult to comprehend, value and sell. The existence of complex and opaque instruments clearly creates systemic risks. First, they present the obvious problem that evaluations of their riskiness are not likely to be reliable. And when valuation is imprecise, it not only complicates risk management inside individual institutions, but also makes the already difficult task of evaluating common exposures even harder. How can officials (or anyone else) know if a concentrated position or a series of counterparty relationships poses the systemic risk of joint failures if they can't even understand the financial instruments themselves?

The second systemic risk posed by such instruments is their capacity to exacerbate procyclicality. Typically, booms are periods of financial innovation. When things are going well, firms and individuals feel confident in experimenting. They create new, untested instruments that are difficult to understand and value. But buyers of these newly minted financial products can be fooled into thinking that innovation and originality imply safety. And sellers have little incentive to convince them otherwise. The result is that, during a boom, flourishing financial innovation will tend to create hidden, underpriced risks. But as strains develop and the boom begins to wane, the previously unseen risks materialise, deepening the retrenchment that is already under way. Financial innovation, although an undeniable source of progress, in this way itself becomes a source of procyclicality and systemic risk.

Balancing innovation and safety in financial instruments requires providing scope for progress while limiting the capacity of any new instrument to weaken the system as a whole. Balance can be achieved by requiring some form of product registration that limits investor access to instruments according to their degree of safety. In a scheme analogous to the hierarchy controlling the availability of pharmaceuticals, the safest securities would, like non-prescription medicines, be available for purchase by everyone; next would be financial instruments available only to those with an authorisation, like prescription drugs; another level down would be securities available in only limited amounts to pre-screened individuals and institutions, like drugs in experimental trials; and, finally, at the lowest level would be securities that are deemed illegal. A new instrument would be rated or an existing one moved to a higher category of safety only after successful tests – the analogue of clinical trials. These

would combine issuance in limited quantities in the real world with simulations of how the instrument would behave under severe stress.

Such a registration and certification system creates transparency and enhances safety. But, as in the case of pharmaceutical manufacturers, there must be a mechanism for holding securities issuers accountable for the quality of what they sell. This will mean that issuers bear increased responsibility for the risk assessment of their products.

Improving the safety of financial markets

The crisis has shown that markets can fail to self-correct, putting the entire financial system at risk. The principal systemic hazard of a financial market is illiquidity – the collapse of a market that comes with the sudden appearance of a large number of sellers and the disappearance of buyers. Beyond having generated illiquidity, the crisis demonstrated once again the lessons of the 1998 experience with Long-Term Capital Management: (1) the ability to buy and sell risk is surely efficiency-enhancing, but when one institution holds a sufficiently large position, it can create common exposures that put the system at risk; and (2) when transactions occur bilaterally, as they do in OTC markets, the failure of one individual or institution can, through linkages across firms and markets, generate joint failures.

Financial markets can also contribute to the procyclicality of the system as a whole. Parties to OTC derivatives transactions generally require collateral to mitigate the counterparty risks they face. But a lack of transparency about exposures can magnify general concerns and amplify cyclical activity in two ways. First, during periods of stress, collateral requirements are likely to make it more difficult to fund existing positions since increases in risk naturally lead to increases in margin requirements. And second, crisis-induced increases in uncertainty will put pressure on markets for the securities used as collateral in OTC transactions, creating the potential for contagion to those markets. The result is procyclicality in which downturns lead to higher margin requirements and reduced market liquidity, forcing a general financial retrenchment with obvious implications for real economic activity.

One way to address at least some of the systemic risks created by OTC financial markets is to replace bilateral arrangements with central counterparties (CCPs). A CCP is an entity that interposes itself between the two sides of a transaction, becoming the buyer to every seller and the seller to every buyer. While the CCP appears to be perfectly hedged – has bought exactly what it has sold – it still faces the risk that someone will default when a payment is due. The CCP addresses that risk by requiring each participant to hold a margin account in which the balance is determined by the value of the participant's outstanding contracts; the more volatile the market, the larger the required margin balance and the more expensive it becomes to hold large positions. And by forcing all transactions to occur on the same platform or set of platforms, it will be straightforward to collect and disseminate information that market participants and authorities can use to monitor the concentration of individual exposures and the linkages that they create. In these ways, the CCP can both reduce risks of common exposures and dampen market volatility.

Furthermore, CCPs are in a position to mitigate the procyclicality that arises from the tendency of individual counterparties to demand increased margin during times of financial stress. As the financial crisis revealed, increased price volatility, combined with uncertainty about counterparty creditworthiness, leads to demands for higher margin. Meeting the request means raising funds, which can prompt forced selling at the worst possible time. With a CCP, margin requirements would be set centrally, not by the counterparties themselves, so margin need not rise during periods of market stress. This feature creates at least the possibility of moderating the increases in margin in a way designed to reduce procyclicality.[7]

For an instrument to be accepted by a CCP, it must have a certain degree of standardisation and documentation, and reliable prices must be available to allow regular marking to market of participants' margin accounts. Because many of the derivatives currently traded over the counter meet these criteria, or could meet them with only slight changes, these requirements do not seem much of an impediment.

The next step in market organisation is to combine the CCP with an organised central exchange as the trading platform. The primary advantage of taking this step is that it ensures price transparency with less reliance on market-makers. As such, the market will be more stable – something suggested by the fact that exchanges are among the markets most likely to continue operating in a crisis. But they do have their limitations. Price transparency reduces the incentives for individuals or institutions to devote capital to making markets, which potentially increases the difficulty of transacting in large quantities. That problem has led the market to create securities exchanges or trading platforms for large transactions with a reduced level of transparency.

In summary, reducing both the common exposures and the procyclicality that put financial stability at risk requires that the trading of financial instruments move significantly away from OTC arrangements, which have dominated some markets for a number of years. Determining where any individual security should land in the spectrum of alternative arrangements will depend on the systemic risks that it poses, and in the end it will be up to individuals to decide how to transact. But by suggesting that certain institutional structures are safer than others, officials will be providing a set of warnings; and by raising the costs of operating in markets that have shown themselves to foster the build-up systemic risk, they will be helping to enhance financial stability.

Improving the safety of financial institutions: a macroprudential framework

By construction, microprudential supervision focuses on the risks within individual institutions and so it does not address the externalities of common exposures and procyclicality. For a number of years, work at the BIS has

[7] It is important to note that a CCP is like an insurance company and that it can fail. As a result, it is ultimately going to rely on public authorities should there be a systemic event. Therefore, prudence means that the CCP must be subject to some form of supervision that might place limits on its size as well as on the concentration of individual exposures within it. And, as discussed below, it means that institutions with derivative exposures be required to hold capital to support those exposures.

emphasised the need for regulators and supervisors to adopt macroprudential policies, which are attuned to the control of system-wide risks. This means calibrating prudential tools – capital requirements, provisioning, leverage ratios and the like – to address common exposures and joint failures on the one hand, and procyclicality on the other.[8]

Common exposures

The current crisis has shown how common exposures create the potential for a broad cross section of institutions to fail simultaneously. The interdependence of financial institutions can come either from similar portfolios or from interconnecting counterparty exposures (for example, because institutions trade with each other). As a result, the risk of the financial system as a whole is based not only on the sum of the risks arising inside individual institutions but also on the degree of correlation among the institutions' balance sheets: the higher the correlation, the higher one would expect systemic risk to be. Put another way, a financial sector with only a few large institutions may be no more risky than one comprising many small institutions whose balance sheets all look the same. The problem in either case is that, because it will reflect only the risks to themselves and not the risks they impose on the system as a whole, the level of capital held by individual institutions will probably be too low.[9] Proposals to mitigate the risks arising from common exposures focus on implementing a *systemic capital charge* (SCC). An SCC would be designed to create a distribution of capital in the system that better reflects the systemic risk posed by individual failures.[10]

Implementing such a scheme requires a measure of systemic risk and an understanding of the marginal contribution of each institution to the total. With those in hand, an individual institution's baseline capital requirement can be set to reflect its systemic importance. The statistical tools needed to calculate the size of an SCC are in their infancy. Work at the BIS has developed a process for assessing marginal, institution-specific contributions to systemic risk essential for implementation of an SCC. One unsurprising conclusion of this work is that large banks contribute more than proportionally to systemic risks, as do banks that are more exposed to system-wide shocks. That result suggests that one may want to require bigger or more interconnected players to hold more capital and have lower leverage, in effect taxing size to create a level playing field from a system-wide perspective (see Box VII.A).[11]

[8] The discussion here largely blurs the distinction between provisions and capital, as both are designed to absorb losses. Provisions are held against *expected* losses, capital is held against *unexpected* losses.

[9] See, for example, S Morris and H Shin, "Financial regulation in a system context", *Brookings Papers on Economic Activity*, no 2, 2008, pp 229–61, for a detailed recent discussion of this point.

[10] A systemic capital charge would complement a minimum leverage ratio – that is, a minimum value for the ratio of capital to assets. The latter can be viewed both as creating a floor below which conventional risk-based capital cannot fall and as a way of containing the systemic risks created by the expansion of an individual institution's balance sheet.

[11] The forthcoming issue of the *Geneva Reports on the World Economy* makes the very sensible suggestion that every financial institution have a bankruptcy contingency plan analogous to its business continuity plan. See M Brunnermeier, A Crockett, C Goodhart, A Persaud and H Shin, *The fundamental principles of financial regulation*, International Center for Monetary and Banking Studies, University of Geneva, 2009, www.cimb.ch.

Box VII.A: Measuring systemic risk and allocating it across individual institutions

Ensuring financial stability calls for an assessment of risk in the financial system as a whole. Achieving that means, first, measuring the likelihood of a systemic event, defined as a failure of one or more institutions that puts the entire system at risk. That measure would then be used in calibrating regulatory and supervisory tools such as insurance premiums or capital requirements. Implementing this calibration involves estimating the marginal contribution of each institution to overall systemic risk – a process discussed here with illustrative examples.

The likelihood of systemic events is determined by the likelihood of failure at individual institutions and by the extent to which institutions are likely to fail simultaneously. In turn, the likelihood of the latter outcome, ie joint failure, rises with the degree of institutions' exposure to common risks. Those risks could originate outside the financial system, or they could arise from counterparty relationships or other linkages inside the financial system.

One way to measure the likelihood of a systemic event is to treat the financial system as a portfolio of institutions and employ numerical techniques that have previously been applied to portfolios of securities. The inputs required for such a calculation are the size of each institution, its probability of default, the loss-given-default in each case, and an estimate of the correlation of defaults across institutions. That information can be collected from supervisory assessments, from prices of bank equity and debt, or from a combination of the two.

The properties of the resulting measure of systemic risk closely parallel those of risk measures for portfolios of securities. In particular, the *overall* level of systemic risk increases with institutions' exposure to common risk factors (Graph III.1); and with the total size of the system held constant, the level of systemic risk increases with the disparity in the relative size of institutions.

Calculations of systemic risk for groups of institutions have been made for some time. But allocating that risk to individual institutions in a way that reflects their contribution to it has proved difficult. Recent work at the BIS has developed just such an allocation procedure. The technique relies on game theory and can be applied quite generally to any measure of systemic risk that adopts a portfolio approach.[1] The final result is an intuitive measure that is transparent and delivers additive allotments of systemic risk.

Performing the allocation exercise for a hypothetical banking system yields a number of important insights. For example, keeping the riskiness of each institution and the size of the system constant, an individual institution's *contribution* to systemic risk increases with its exposure to common risk factors. Importantly, the increase is greater for riskier or larger institutions. In addition, an institution's relative contribution to risk in the system as a whole increases more than in proportion to its relative size (Table VII.A), a result reflecting the fact that larger institutions play a disproportionate role in systemic events.

Allocation of systemic risk to individual institutions

Per unit of overall system size

	Strongly capitalised system (probability of default = 0.1%)	**Weakly capitalised system** (probability of default = 0.3%)
Two small banks, each with 20% market share	3.1%	3.9%
Two large banks, each with 30% market share	5.8%	7.1%
Total systemic risk (four banks)	17.8%	22.0%

Total systemic risk equals the expected loss in the 0.2% right-hand tail of the distribution of portfolio losses. The first two rows of the table report bank-level contributions to total systemic risk. Loss-given-default is set to 55%. All banks are assumed to have the same sensitivity to common risk factors, implying a common asset return correlation of 42%.

Source: BIS calculations. Table VII.A

The system-wide perspective shown here provides guidance on the construction of macroprudential tools. If such tools are to incorporate institutions' contribution to systemic risk, they will need to reflect factors that go well beyond the likelihood of individual failures. This means that an institution's deposit insurance premium, capital requirement and the like will have to reflect both the likelihood of its own failure and its exposure (and contribution) to system-wide risk.

Likewise, insurance and capital charges faced by large institutions will need to reflect the disproportionate impact of their size on the likelihood of a systemic event. And although portfolio diversification might reduce the risk of an individual failure, it could make institutions more similar to one another and, as a result, increase the likelihood of joint failure. Nonetheless, it seems clear that policymakers need to collect the appropriate data and build the appropriate analytical models to allow them to incorporate system-wide considerations into their evaluations of individual institutions.

[11] For a technical description of the procedure, see C Borio, N Tarashev and K Tsatsaronis, "Allocating system-wide tail risk to individual institutions", *BIS Working Papers*, forthcoming.

Institutions that are too big to fail – those that create intolerable systemic risk by themselves because many others are exposed to them – pose a significant challenge in this context. And the mergers and acquisitions that have formed a part of the crisis response in the past two years may have increased the number of such institutions; although this is understandable as a transitional phenomenon, officials realise that it creates an unsustainable structure. Addressing the problem has become a high priority for many national authorities, which are working to set up resolution procedures for every financial institution in their respective jurisdictions.

Procyclicality

The second externality highlighted by the current crisis is the procyclicality created by the tendency of institutions to become less prudent during cyclical upturns and more prudent during downturns. At a conceptual level, proposals to reduce, neutralise or even reverse the procyclicality of the financial system must either provide insurance against systemic downturns when they come, or introduce countercyclical mechanisms to forestall or mitigate them. The following discussion addresses the potential for the latter.

Policymakers have shown a clear desire to create new policy instruments to ensure that financial institutions adjust their capital (and other safeguards, such as loan provisioning and liquidity standards) countercyclically. Such a *countercyclical capital charge* (CCC) would require institutions to build up defensive buffers in good times that could be drawn down in bad times.[12] One possibility for implementing a CCC is a purely rule-based approach that builds automatic stabilisers into the regulatory framework. While they may be difficult to implement in a robust way, rules would commit policymakers to act, creating an important degree of predictability for financial institutions.

An alternative to a purely rule-based approach would be to administer adjustments to capital buffers in a manner that is analogous to adjusting the policy interest rate, albeit at a much lower frequency and in a much more predictable, and therefore mechanical, way. Many years of experience have led monetary authorities to their current practice, basing their conventional interest rate decisions on the outlook for inflation and economic activity, often with substantial input from quantitative models. Is it possible to formulate a similarly

[12] See, for example, Financial Stability Forum, *Report of the Financial Stability Forum on enhancing market and institutional resilience*, 7 April 2008, www.financialstabilityboard.org/publications/r_0804.pdf, and *Report of the Financial Stability Forum on addressing procyclicality in the financial system*, 2 April 2009, www.financialstabilityboard.org/publications/r_0904a.pdf.

simple procedure that could guide the authorities in setting a CCC? Success requires overcoming a series of obstacles similar to those that were overcome through decades of experience in the monetary policy arena.

One obstacle to calculating a countercyclical capital charge is knowing when buffers have to be built up (increasing the CCC) to make lending more costly in a boom, and when they can be reduced or released (lowering the CCC) to promote lending during a bust. In essence, it would be necessary to quantify the risks to stability (risks that would play a role similar to that played by inflation and output gaps in monetary policy decisions). Work done at the BIS suggests that, while it may be possible to identify macroeconomic indicators that correctly signal when the buffers should be built up, identifying when they should be released is more difficult. As a result, the management of countercyclical capital buffers is likely to require some degree of discretion combined with a rule to create predictability (see Box VII.B).

Yet another problem with implementing a CCC is that it is not "one size fits all". Instead, capital buffers (or countercyclical provisioning) will need to vary with the nature of individual institutions' businesses. For example, because cycles differ across countries, a CCC must be adjusted separately for each geographical portfolio held by an institution operating across national boundaries.

While the countercyclical capital charge tells us the amount by which capital buffers are to be built up and drawn down through the credit cycle, it is largely silent about the average level of capital that needs to be held in the system. The current baseline level of capital held by financial institutions is by broad agreement too low, but by how much?[13] Answering the question involves ascertaining the long-run equilibrium level of capital (the analogue to the long-term equilibrium interest rate that serves as the benchmark in the case of traditional monetary policy). This, in turn, influences the distribution of risks between the private owners and the public sector. The higher the level of capital that financial institutions are required to hold, the lower the risk borne by the public. But higher capital levels raise the costs of doing business and thus raise the price of loans.

It is important to note that one of the most pressing tasks for everyone is the proper consolidation of financial institutions' balance sheets. The crisis very clearly exposed the risks created by a shadow banking system that had been spun off by regulated institutions. Therefore, the first order of business in improving the management of capital is to bring all of these entities, including structured investment vehicles and the like, within the regulatory perimeter to ensure that appropriate capital is held against all financial institution obligations. This will give managers, investors and supervisors a more accurate picture of an institution's exposures at the same time that it raises the total amount of capital in the financial system.[14]

[13] See, for example, Financial Services Authority, *The Turner Review: a regulatory response to the global banking crisis*, March 2009, www.fsa.gov.uk/pubs/other/turner_review.pdf.

[14] Regulatory capital in the financial system is likely to increase as a consequence of several developments: the broadening of the regulatory perimeter to include all systemically important institutions and markets; a significant amount of off-balance sheet assets coming back onto the balance sheet of financial institutions; provisioning that better reflects the build-up of risk; changes in the composition of capital that will promote high-quality capital; and better risk capture in minimum capital requirements.

Box VII.B: Alternative rules for countercyclical capital buffers – an illustration

The crisis has focused attention on mechanisms for ensuring that banks adjust their capital (or loan provisioning) countercyclically, building it up in good times and then drawing it down as stress materialises. Researchers are examining a number of approaches, many of them still in the early stages of development. Here we examine the feasibility of devising a rule that induces countercyclical adjustments in minimum capital requirements.

Any rule for minimum capital must be designed in three steps: (1) choosing the indicator that signals the time to build up and release the capital buffer; (2) choosing a formula that determines how the indicator will modify the minimum capital requirement; and (3) choosing the minimum capital requirement, which itself might vary cyclically. We illustrate the first two steps here.

For the first step, the following discussion covers three macroeconomic indicators on which preliminary research has been reported in the literature (Graph VII.B.1): credit spreads (left-hand panel), the change in real credit (centre panel) and a composite indicator that combines the credit/GDP ratio and real asset prices (right-hand panel).[①,②] The ideal macroeconomic indicator would reliably identify both the expansion and stress phases of the banking cycle. With that in mind, we present the variables as deviations from their respective neutral levels, measured here by a trend or long-term average; and the phases of the banking cycle are measured by deviations of the charge-off rate from its long-term average.

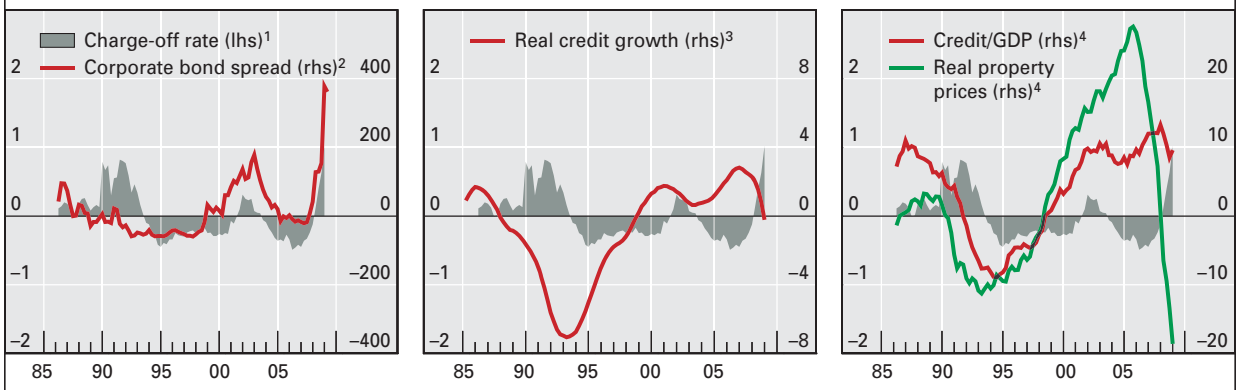
Narrowed credit spreads could be a signal of good times, and a significant widening may indicate the onset of a deterioration. However, the credit spread, measured here with BBB corporate bond spreads, is not a reliable indicator of banking system stress. For example, in contrast to the historical realities of banking stress, this indicator points to more serious financial strains after the collapse of the dotcom bubble than in the early 1990s.

The second candidate indicator is the change in credit, a choice based on the idea that banks tend to overextend credit before crises emerge and deleverage once strains materialise. However, credit growth exhibits considerable inertia, and it remains well above the neutral level even as banking strains begin to emerge. Hence, an indicator based on credit alone is likely to be late in signalling a release of the buffer.

The third potential indicator draws on previous BIS research, which has found that when the credit/GDP ratio and real asset prices simultaneously deviate by large amounts from their respective trends, they provide a fairly reliable signal of impending banking crises with a considerable lead time.[③] Because the composite indicator requires that a real asset price and the ratio of credit to GDP exceed thresholds at the same time, it avoids the late release of the buffer induced by the credit variable, but it may trigger it too early.

In the second step – choosing the formula that determines how the indicator will modify the minimum capital requirement – we examine the case in which the adjustment factor simply scales the

Alternative indicators and charge-off rate in the United States



[1] Loans and leases removed from the books and charged against loss reserves, as a percentage of average total loans. [2] Deviation of long-term BBB-rated corporate bond spreads from their long-term average, in basis points. [3] Exponentially weighted five-year average real credit growth minus its 15-year rolling average, in percentage points. [4] Deviation of each variable from its one-sided long-term trend (that is, a trend determined only from information available at the time assessments are made); credit/GDP ratio in percentage points, property prices in per cent.

Sources: Moody's; national data; BIS calculations. Graph VII.B.1

minimum capital requirement multiplicatively.[4] When the indicator is at its neutral level, the multiple is set to 1 so that the formula will make no adjustment to the buffer at that point. For illustrative purposes, we consider three formulas that differ in how they treat the uncertainty that inevitably surrounds the neutral level of the indicator and in their degree of symmetry with respect to adjustments to the minimum requirement.

In its treatment of uncertainty around the neutral level, formula 1, unlike the other two formulas, produces changes in the buffer that are steepest precisely around that level (Graph VII.B.2, left-hand panel). In that way, formula 1 actually magnifies any errors in measuring the neutral level. Only formula 3 takes the uncertainty fully into account by not triggering an adjustment within a range around the neutral value.

Regarding symmetry, formula 2 is unique in never being smaller than 1. Hence, regardless of the state of the financial system, the buffer determined by formula 2 can never fall below the requirement associated with the neutral level of the indicator. Whether that is desirable will depend on how the minimum capital requirement is defined and how it is allowed to vary (step 3 of the procedure for creating a rule). For example, if the minimum is highly procyclical and thus rises strongly in bad times, this characteristic would effectively prevent any release of actual capital.

Finally, to illustrate how the formulas adjust the minimum requirement under actual historical circumstances, an indicator is chosen for each formula: for formula 1, credit spreads (called here adjustment 1); for formula 2, the change in real credit (adjustment 2); and for formula 3, the composite indicator (adjustment 3). The results (Graph VII.B.2, centre and right-hand panels) support, on balance, the tentative conclusions that came from the performance of the indicators.

Adjustment 1 performs well in the current crisis, for both the build-up and the release phases. However, such a rule would have called for a large release of capital during and after the dotcom bust, but nearly no release in the early 1990s when the banking system experienced strains in the United States.

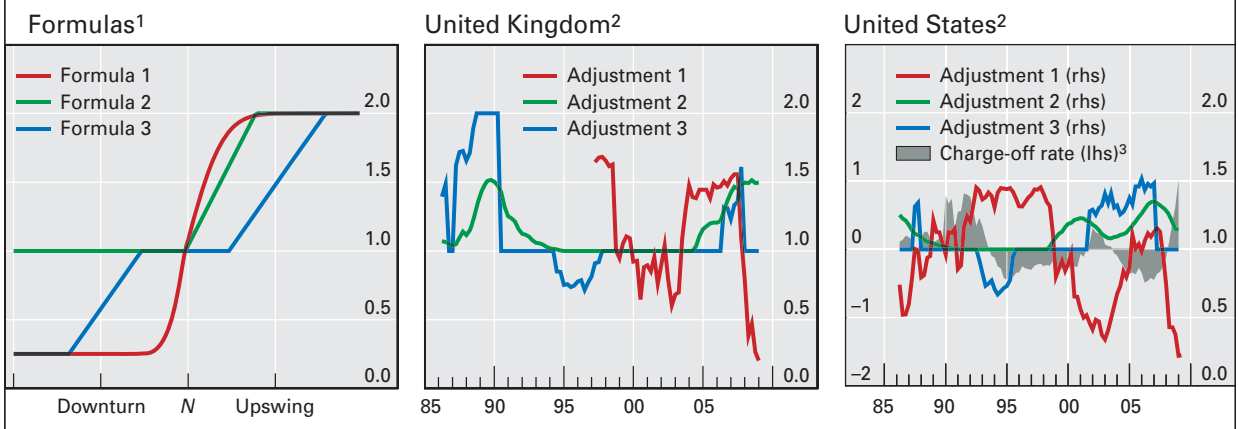
Adjustment 2 presents an accurate signal for the build-up phase but is late in calling for the release, both for the current crisis and for the previous period of stress in the early 1990s. The adjustment thus reflects the lag with which credit growth falls after stress emerges.

Adjustment 3 provides a good signal for the build-up of the capital buffer but in some instances implies premature release. In particular, for the current crisis, the signal would have called for release starting at the end of 2006 for the United States, ahead of the first obvious signs of strain, owing to property prices falling below the time-varying trend. Adjustments below 1, however, tend to occur too late, indicating that combining formula 2 with this indicator would be more desirable.

This analysis, though merely illustrative, points to difficulties in developing robust rules to govern countercyclical capital buffers. Finding macroeconomic variables that would reliably signal the appropriate time for a release of the buffers appears to be especially challenging. Ultimately, the use of some form of discretion to manage countercyclical buffers may prove to be inevitable.

Candidate rules for countercyclical capital buffers and illustrations

Multiplicative adjustments



[1] All formulas assume a neutral level, *N*, of the indicator variable. Values to the right of *N* indicate an upswing; values to the left, a downturn. [2] Adjustment 1 applies credit spreads to formula 1. Adjustment 2 applies the exponentially weighted five-year average real credit growth to formula 2. Adjustment 3 applies the composite indicator to formula 3. [3] Loans and leases removed from the books and charged against loss reserves, as a percentage of average total loans.

Sources: Merrill Lynch; Moody's; national data; BIS calculations. Graph VII.B.2

[1] Credit spreads taken from CDS have been suggested by M Gordy, and formula 1 has been constructed in the spirit of his work: M Gordy, "First, do no harm – a hippocratic approach to procyclicality in Basel II", paper presented at the conference *Procyclicality in the financial system*, jointly organised by the Netherlands Bank and the Bretton Woods Committee, 9–10 February 2009. Credit growth and a formula similar to formula 2 have been suggested by C Goodhart and A Persaud, "A party pooper's guide to financial stability", *Financial Times*, 4 June 2008. The composite indicator builds on C Borio and M Drehmann, "Assessing the risk of banking crises – revisited", *BIS Quarterly Review*, March 2009, pp 29–46. [2] While not shown, indicators based on GDP alone were also assessed and were found to have a lower correlation with the measure of financial strain than any of the variables considered here. [3] Borio and Drehmann also use equity price gaps for the asset price portion of the composite indicator; equity prices have not played a crucial role in the current crisis and are therefore not shown in Graph VII.B.1. However, both equity and property price gaps are included in adjustment 3, shown in Graph VII.B.2. [4] If the formula is applied to Basel II rather than to some other minimum that is complementary to Basel II (such as a leverage ratio), the multiplicative approach would have the desirable property of cross-sectional risk sensitivity – that is, it would preserve risk differentiation across borrowers at any given time.

To conclude, determining the level and cyclical sensitivities of capital requirements is a difficult task. But, then, so is setting the stance of either monetary or fiscal policy. And as with conventional macroeconomic stabilisation policy at the turn of the 20th century, it has become all too apparent today that establishing a macroprudential orientation cannot be avoided and that countercyclical capital charges are one of a number of tools that will be needed for success.

Macroeconomic policies to enhance financial stability

The crisis has confirmed that the monetary and fiscal policy framework that delivered the Great Moderation cannot be relied upon to stabilise prices and real growth forever. The consensus today is that policymakers must be given an explicit financial stability mandate and that they will need additional tools to carry it out. The macroprudential approach to regulation and supervision will form a part of that, but it is not likely to be enough. Macroeconomic policies can and should have a role in meeting the goal of financial stability; at the very least, they should not hinder it.

Fiscal and monetary policy already help short-circuit the reinforcing feedback between the real economy and the financial system. Through automatic stabilisers and discretionary stimulus, countercyclical fiscal policy sustains income and employment, lowering the probability that borrowers will default (as well as increasing the value of what is recovered if they do) and raising the value of assets on financial institutions' balance sheets. Monetary policy, too, acts countercyclically. Seeking to head off a cyclical downturn, policymakers lower policy rates and, in so doing, improve the state of financial institutions' balance sheets. Similarly, central bankers increase policy rates to moderate an upturn, slowing credit growth and leaning against asset price booms. And ultimately, central banks provide emergency lending facilities to prevent runs on individual institutions from turning into system-wide panics – thus moderating a significant source of systemic risk. Put another way, by reducing cyclical fluctuations in the real economy, countercyclical fiscal and monetary policies naturally (and intentionally) reduce the procyclicality of financial institutions' capital.[15]

[15] The ability of fiscal authorities to recapitalise banks during bad times can also be viewed as a tool for addressing systemic risk. To institutionalise that ability to counter the procyclicality of the financial system, however, government officials would have to create a fiscal reserve. Like the countercyclical capital buffers for institutions, this reserve would rise during booms so that it can be drawn down during busts.

But monetary policy must go further. Stabilising the financial system requires that central banks adopt a more activist stance, responding to booms in both credit and asset prices. Past critiques of this approach remain valid. It will be no easier in the future to identify bubbles and calibrate policies to neutralise them than it was in the past. But the financial crisis has shown that it is ultimately too costly for central bankers to focus narrowly on inflation over relatively short horizons, with a view towards cleaning up the mess caused by bursting bubbles and collapsing credit after the fact. The debate has moved on. The issue is how monetary policymakers should expand their frameworks to make room for property prices, equity prices and amounts of debt outstanding. When they do make those adjustments, they will be in a position to implement policies that lean against the wind, tightening interest rates when they see bubbles and balance sheet overextensions that raise systemic, macroeconomic risks.

The expansion of the policy framework does not mean forsaking central banks' price stability objectives, as it is not aimed at changing long-term targets or goals. Instead, it is aimed at adjusting the horizon over which policymakers achieve their goals. When asset price and credit booms start to develop, they are unlikely to threaten the short-run stability of prices or real growth. In fact, they may go hand in hand with a combination of low consumer price inflation (especially if the measure does not include house prices) and high growth. That is, a boom in asset prices or credit can easily be mistaken for an increase in the growth rate of productivity. It is important for policymakers to understand that higher growth and lower inflation today can create instability tomorrow, and policy frameworks must take this into account. When they see a boom in an asset price or in credit, policymakers need to lengthen their policy horizon. Such an approach would help to better achieve the goals of fiscal and monetary policy: after all, macroeconomic stability is built on the foundations of a stable financial system.

Summing up

We have no choice but to take up the challenge of first repairing and then reforming the international financial system, all the while cushioning the impact of the crisis on individuals' ability to live productive lives. Efforts so far have fully engaged fiscal, monetary and prudential and regulatory authorities for nearly two years. The public resources devoted to economic stimulus and financial rescue have been staggering, approaching 5% of world GDP – more than anyone would have imagined even a year ago.

Recovery will come at some point, but there are major risks. First and foremost, policies must aid adjustment, not hinder it. That means moving away from leverage-led growth in industrial economies and export-led growth in emerging market economies. It means repairing the financial system quickly, persevering until the job of restructuring is complete. It means putting policy on a sustainable path by reducing spending and raising taxes as soon as stable growth returns. And it means the exit of central banks from the intermediation business as soon as financial institutions settle on their new business models and financial markets resume normal operations.

In the long term, addressing the broad failures revealed by the crisis and building a more resilient financial system require that we identify and mitigate systemic risk in all its guises. That, in turn, means organising financial instruments, markets and institutions into a robust system that will be closer to fail-safe than the one we have now: for instruments, a system that rates their safety, limits their availability and provides warnings about their suitability and risks; for markets, encouraging trading through central counterparties (CCPs) and exchanges, making clear the dangers of transacting elsewhere; and for institutions, the comprehensive application of enhanced prudential standards combined with a system-wide perspective, beginning with the application of something like a systemic capital charge (SCC) and a countercyclical capital charge (CCC).

Successfully promoting financial stability requires that everyone contribute. Monetary policymakers must take better account of asset price and credit booms. Fiscal policymakers must ensure that their own actions are consistent with medium-term fiscal discipline and long-term sustainability. And regulators and supervisors must adopt a macroprudential perspective, worrying at least as much about the stability of the system as a whole as they do about the viability of an individual institution. An encompassing policy framework with observable objectives and implementable tools is at an unfortunately early stage of development. But the suggestions made here and elsewhere are a start. The work will have to be coordinated internationally. In particular, institutions with expertise in the field – including the Basel-based standard-setting committees and the Financial Stability Board – will need to play a leading role in making such a framework operational. This is going to be a long and complex task, but we have no choice. It has to be done.

Contents

Organisation, activities and financial results

This chapter reviews the organisation of the Bank for International Settlements (BIS), summarises its activities for the financial year 2008/09 and presents its financial results.

Organisation

The mission of the BIS is to serve central banks and financial authorities in their pursuit of monetary and financial stability, to foster international cooperation on such matters and to serve as a bank for central banks. The BIS pursues this mission by:

- promoting discussion and facilitating decision-making among central banks;
- supporting dialogue with other authorities that have responsibility for promoting financial stability;
- conducting research on policy issues confronting central banks and financial system supervisory authorities;
- acting as a prime counterparty for central banks in their financial transactions; and
- serving as an agent or trustee in connection with international financial operations.

The BIS has its head office in Basel, Switzerland, and representative offices in the Hong Kong Special Administrative Region of the People's Republic of China and in Mexico City. At the end of the financial year, the BIS employed 570 staff from 53 countries.

Departments and committees

The BIS has three main departments: the Monetary and Economic Department, the Banking Department and the General Secretariat. These are supplemented by: the Legal Service; the Compliance and Operational Risk Unit, Internal Audit and Risk Control; and the Financial Stability Institute, which fosters the dissemination of standards and best practices to financial system supervisors worldwide.

The BIS hosts the secretariats of a number of groups that seek to promote financial stability. Four committees, which enjoy a significant degree of autonomy in setting their agendas and structuring their activities, were established over the past 40 years:

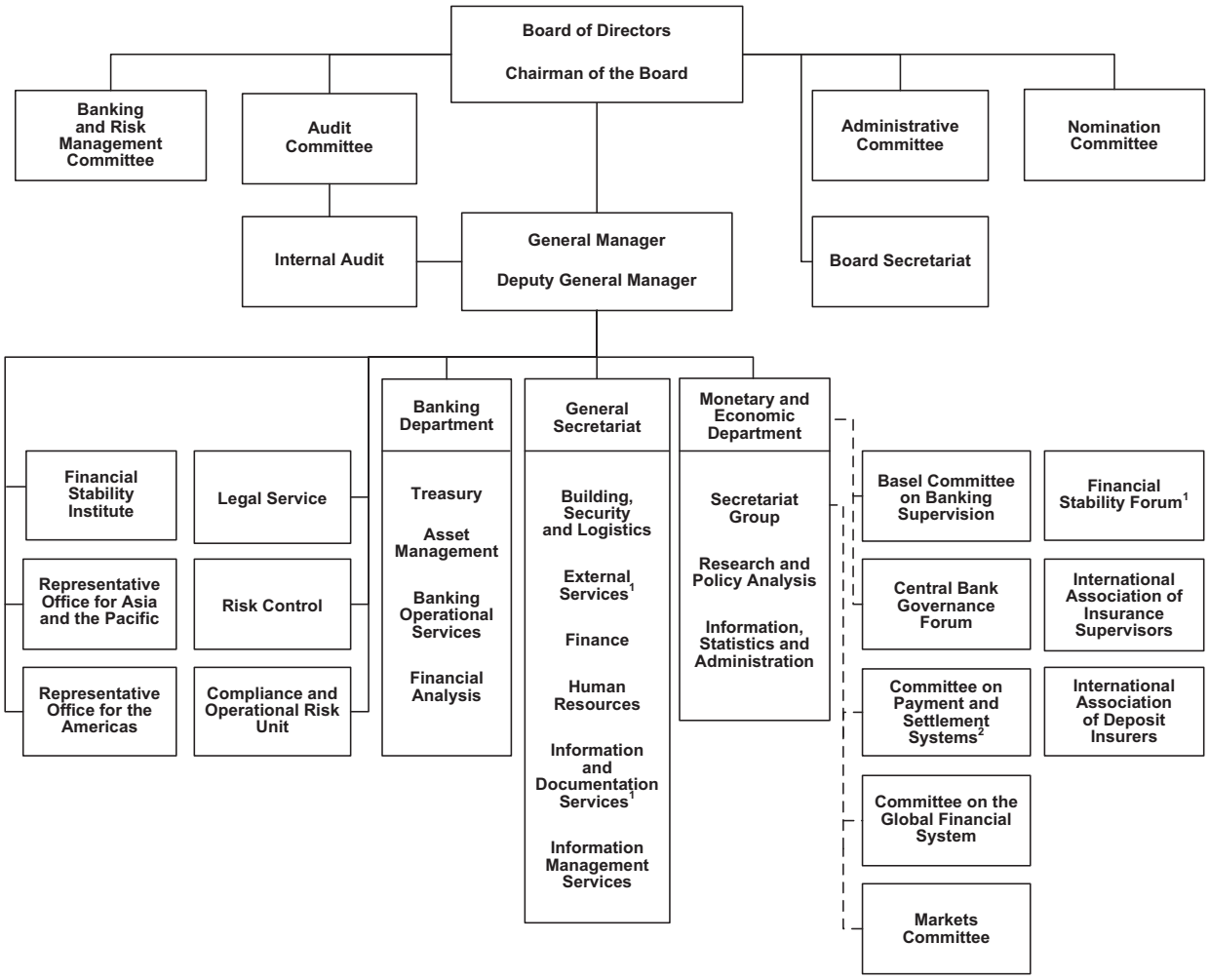
- the Basel Committee on Banking Supervision;
- the Committee on the Global Financial System;
- the Committee on Payment and Settlement Systems; and
- the Markets Committee.

Three groups whose secretariats are hosted by the BIS do not report directly to the BIS or its member central banks:

- the Financial Stability Board (formerly the Financial Stability Forum);
- the International Association of Deposit Insurers; and
- the International Association of Insurance Supervisors.

In addition, the Irving Fisher Committee on Central Bank Statistics, which is governed by the international central banking community, operates under the Bank's auspices. The BIS also supports the work of the Central Bank Counterfeit Deterrence Group.

Organisation of the BIS as of 31 March 2009



1 On 1 April 2009, the Financial Stability Forum became the Financial Stability Board; External Services became Meeting Services; and Information and Documentation Services became Communications.

2 The CPSS secretariat also handles the secretariat functions for the Central Bank Counterfeit Deterrence Group.

Governance and management

There are three main decision-making levels in the governance and management of the Bank:

- the General Meeting of member central banks;
- the Board of Directors; and
- the General Manager.

The General Meeting. Fifty-five central banks or monetary authorities are currently members of the BIS. These 55 member banks have rights of voting and representation at General Meetings. The Annual General Meeting (AGM) is held within four months from 31 March, the end of the BIS financial year.

The Board of Directors. The Board of Directors comprises 19 members. Its main responsibilities are determining the strategic and policy direction of the BIS and supervising the Bank's Management. The Board is assisted by four subcommittees of Board members: the Administrative Committee, the Audit Committee, the Banking and Risk Management Committee and the Nomination Committee.

The General Manager. The General Manager of the BIS is responsible to the Board of Directors for the conduct of all important matters affecting the BIS. The General Manager is advised by the Executive Committee of the BIS, which consists of the General Manager as chair, the Deputy General Manager, the Heads of Department and other officers of similar rank appointed by the Board.

BIS member central banks[1]

Bank of Algeria

Central Bank of Argentina

Reserve Bank of Australia

Austrian National Bank

National Bank of Belgium

Central Bank of Bosnia and Herzegovina

Central Bank of Brazil

Bulgarian National Bank

Bank of Canada

Central Bank of Chile

People's Bank of China

Croatian National Bank

Czech National Bank

National Bank of Denmark

Bank of Estonia

European Central Bank

Bank of Finland

Bank of France

Deutsche Bundesbank (Germany)

Bank of Greece

Hong Kong Monetary Authority

Magyar Nemzeti Bank (Hungary)

Central Bank of Iceland

Reserve Bank of India

Bank Indonesia

Central Bank & Financial Services Authority of Ireland

Bank of Israel

Bank of Italy

Bank of Japan

Bank of Korea

Bank of Latvia

Bank of Lithuania

National Bank of the Republic of Macedonia

Central Bank of Malaysia

Bank of Mexico

Netherlands Bank

Reserve Bank of New Zealand

Central Bank of Norway

Bangko Sentral ng Pilipinas (Philippines)

National Bank of Poland

Bank of Portugal

National Bank of Romania

Central Bank of the Russian Federation

Saudi Arabian Monetary Agency

Monetary Authority of Singapore

National Bank of Slovakia

Bank of Slovenia

South African Reserve Bank

Bank of Spain

Sveriges Riksbank (Sweden)

Swiss National Bank

Bank of Thailand

Central Bank of the Republic of Turkey

Bank of England

Board of Governors of the Federal Reserve System

[1] In accordance with Article 15 of its Statutes, the Bank's capital is held by central banks only. The legal status of the Yugoslav issue of the capital of the BIS is currently under review following the constitutional changes in February 2003 which transformed the Federal Republic of Yugoslavia into the State Union of Serbia and Montenegro, establishing two separate central banks, and the Republic of Montenegro's subsequent declaration of independence from the State Union in May 2006.

Board of Directors[2]

Guillermo Ortiz, Mexico City
Chairman of the Board of Directors

Hans Tietmeyer, Frankfurt am Main
Vice-Chairman

Ben S Bernanke, Washington
Mark Carney, Ottawa
Mario Draghi, Rome
William C Dudley, New York
Stefan Ingves, Stockholm
Mervyn King, London
Jean-Pierre Landau, Paris
Christian Noyer, Paris
Guy Quaden, Brussels
Jean-Pierre Roth, Zurich
Masaaki Shirakawa, Tokyo
Jean-Claude Trichet, Frankfurt am Main
Paul Tucker, London
Alfons Vicomte Verplaetse, Brussels
Axel A Weber, Frankfurt am Main
Nout H E M Wellink, Amsterdam
Zhou Xiaochuan, Beijing

Alternates

Paul Fisher or Michael Cross, London
Pierre Jaillet or Denis Beau, Paris
Donald L Kohn or D Nathan Sheets, Washington
Hans-Helmut Kotz or Wolfgang Mörke, Frankfurt am Main
Peter Praet or Jan Smets, Brussels
Fabrizio Saccomanni or Ignazio Visco, Rome

Committees of the Board of Directors

Administrative Committee, chaired by Hans Tietmeyer
Audit Committee, chaired by Christian Noyer
Banking and Risk Management Committee, chaired by Stefan Ingves
Nomination Committee, chaired by Guillermo Ortiz

[2] As of 31 May 2009.

Senior officials

Jaime Caruana	General Manager
Hervé Hannoun	Deputy General Manager
Peter Dittus	Secretary General, Head of Department
Stephen G Cecchetti	Economic Adviser, Head of Monetary and Economic Department
Günter Pleines	Head of Banking Department
Daniel Lefort	General Counsel
Már Gudmundsson	Deputy Head of Monetary and Economic Department
Jim Etherington	Deputy Secretary General
Louis de Montpellier	Deputy Head of Banking Department
Josef Tošovský	Chairman, Financial Stability Institute

Changes among the Board of Directors and senior officials

At its meeting in January 2009, the Board elected Guillermo Ortiz, Governor of the Bank of Mexico, to succeed Jean-Pierre Roth, Chairman of the Governing Board of the Swiss National Bank, as Chairman of the Board of Directors for a period of three years commencing on 1 March 2009.

By letter dated 17 October 2008, Axel A Weber, President of the Deutsche Bundesbank, reappointed Hans Tietmeyer as a member of the Board of Directors for a period of two years from 1 January 2009 to 31 December 2010. At its meeting in November 2008, the Board re-elected Hans Tietmeyer as Vice-Chairman of the Board of Directors for the same period.

Fabrizio Saccomanni, Director General of the Bank of Italy, stepped down from the Board of Directors at the end of his term of appointment on 22 December 2008.

On 26 January 2009, Timothy F Geithner resigned as President of the Federal Reserve Bank of New York and vacated his seat on the Board. By letter dated 2 February 2009, Ben S Bernanke, Chairman of the Board of Governors of the Federal Reserve System, appointed William C Dudley as a member of the Board of Directors for the remaining period of Mr Geithner's term of office, ending on 12 September 2009.

At its meeting in March 2009, the Board took note of the reappointment by Guy Quaden, Governor of the National Bank of Belgium, of Vicomte Verplaetse, Honorary Governor of the National Bank of Belgium, as a member of the Board of Directors for a further period of 10 months, expiring on 31 December 2009.

The Board noted with deep regret the death of Lord George of St Tudy on 18 April 2009 at the age of 70. Lord George had served as an ex officio Director of the Board while Governor of the Bank of England between 1993 and 2003, and as an appointed Director from 2003 until his death.

By letter dated 23 April 2009, Mervyn King, Governor of the Bank of England, appointed Paul Tucker, Deputy Governor of the Bank of England, as a member of the Board of Directors for the remaining period of Lord George's term of office ending on 6 May 2011.

It was with deep regret that the Bank learned of the death of Baron Jean Godeaux, Honorary Governor of the National Bank of Belgium, on 27 April 2009 at the age of 86. Baron Godeaux had served on the Board as a Director from 1982 to 1990, during which time he had served as President of the Bank and Chairman of the Board of Directors from 1985 to 1987.

The Board also noted with deep sadness the death of Masaru Hayami, former Governor of the Bank of Japan, on 16 May 2009 at the age of 84. Mr Hayami had served on the Board as a Director from 1998 to 2003.

As regards the senior officials of the Bank, upon the resignation of Malcolm D Knight on 30 September 2008, Hervé Hannoun exercised the responsibilities of General Manager under the title of Acting General Manager until the date upon which a new General Manager took up his duties. Jaime Caruana was appointed as the Bank's new General Manager for a period of five years from 1 April 2009.

At its meeting in March 2009, the Board reappointed Peter Dittus as the Bank's Secretary General for a period of five years beginning on 1 January 2010.

Daniel Lefort, the Bank's present General Counsel, will retire from the BIS with effect from 30 September 2009. At its meeting in May 2009, the Board appointed Diego Devos as the Bank's General Counsel for a period of five years beginning on 1 October 2009.

At the same meeting, the Board reappointed Günter Pleines as Head of the Banking Department for a period of three years and one month from 1 April 2010.

Institutional and administrative matters

The Bank's administration

Budget policy

The process of formulating the Bank's expenditure budget for the next financial year starts about six months in advance with the setting by Management of a broad business orientation and financial framework. Within this context, business areas specify their plans and the corresponding resource requirements. The process of reconciling detailed business plans, objectives and overall resource availability culminates in the determination of a draft financial budget. This must be approved by the Board before the start of the financial year.

In drawing up the budget, a distinction is made between administrative and capital expenditures. In common with other organisations of a similar

nature to the BIS, Management and staff expense, including remuneration, pensions and health and accident insurance, amounts to around 70% of administrative costs. Other major categories, each accounting for around 10% of administrative spending, are expenditure on information technology (IT) and telecommunications, and on buildings and equipment. Capital spending mainly relates to building and IT investment expenditure, and can vary significantly from year to year. Most of the Bank's administrative and capital expenditure is incurred in Swiss francs.

Administrative expenses before depreciation for the financial year 2008/09 amounted to 237.9 million Swiss francs, 4.6% below the budget of 247.9 million Swiss francs,[3] while capital expenditure, at 22.1 million Swiss francs, was 2.9 million under budget. The main contributor to the underspending in administrative expenses was the impact of the lower than budgeted headcount, which arose from delays in recruitment for open staff positions. Spending on the Bank's data centre and on other IT and telecommunications items was also below budget.

Administrative and capital expenditure in 2008/09 reflected the priorities set in the budget, chief among them the further strengthening of the resilience of the BIS and its capacity to deal with unforeseen developments. This involved the following measures:

- Against the background of the market turbulence which began in August 2007, budget provisions were created for additional staff positions in the Banking Department, the Financial Stability Forum (now the Financial Stability Board) and the Compliance and Operational Risk Unit. The required reallocation of resources was achieved by reducing staff positions in the General Secretariat, in particular by outsourcing certain IT activities.
- The Bank's second data centre was relocated to a remote site to give greater assurance of business continuity and service to customers in the event of a major disruption in Basel.

The work of the Bank during the financial year was dominated by the need to deal with the challenges posed by the intensifying global financial crisis, and the Bank's resources were reoriented to cope with the resulting workload. This was achieved within the budget ceiling, and involved the following initiatives:

- The Monetary and Economic Department changed the focus of its work programmes and redirected its staff to concentrate on financial stability issues that came to the fore in the crisis, both in its support for the committees hosted at the BIS and in its research activities.
- The Banking Department and the Risk Control and Finance units took a series of measures to reduce the Bank's financial risks, which involved reducing credit risk through increased investment in sovereign and quasi-sovereign assets, shortening the duration of the financial instruments on both sides of the balance sheet, and taking a number of steps to protect

[3] The Bank's budgetary accounting is cash-based and excludes certain financial accounting adjustments, principally relating to retirement benefit obligations, which take into account financial market and actuarial developments. These additional factors are included under "Operating expense" disclosed in the profit and loss account (see "Financial results and profit distribution").

the Bank's liabilities. These measures, together with the volatility that arose from dislocated financial markets, increased the operational workload of the banking activity and additional staff resources were allocated to deal with the extra work.

Work also continued on the following initiatives to meet the needs of the Bank's shareholders:

- the expansion of BIS services to deepen relations with shareholders in the Asia-Pacific region through continuation of the Asian research programme;
- the creation of a Consultative Council for the Americas; and
- the completion of multi-year projects to enhance meeting facilities and safety in Basel.

In March 2009, the Board approved an increase in the administrative budget for the financial year 2009/10 of 4.0% to 259.2 million Swiss francs. The capital budget foresees a decrease of 3.1 million Swiss francs to 21.9 million. The main priority in framing the budgets for 2009/10 is to reinforce the Bank's response to the global financial crisis as follows:

- Resources devoted to financial stability issues will be increased by the creation of additional staff positions to support the work of the Financial Stability Board, the Basel Committee on Banking Supervision and the Committee on the Global Financial System in handling their increased responsibilities and workload.
- Dealing with the impact of the financial crisis on the BIS banking business will continue to be the main priority of the Banking Department and the Risk Control, Finance and Compliance units. Work in the banking business will be oriented towards controlling the size and enhancing the management of the banking operations through initiatives to implement integrated risk management and enhance management accounting.

In addition, the budget for 2009/10 provides for the further development of the Bank's global outreach through support for the Consultative Council for the Americas and through the creation of a permanent economics research unit at the Asian Office following the completion of the Asian research programme in September 2009. The visitors' restaurant facilities in the Tower building in Basel will also be upgraded after over 30 years of use.

Remuneration policy

The jobs performed by BIS staff members are assessed on the basis of a number of objective criteria, including qualifications, experience and responsibilities, and are classified into distinct job grades. The job grades are associated with a structure of salary ranges. Every three years, a comprehensive salary survey is conducted in which BIS salaries are benchmarked against compensation in comparable institutions and market segments. When benchmarking BIS salaries against comparators, the Bank focuses on the upper half of market compensation in order to attract highly qualified staff. The analysis takes into account differences in the taxation of compensation for the staff of the surveyed institutions. The most recent such survey took place in the second half of 2007, with the benchmark data

collected reflecting the comparator market as of 1 July 2007. As of 1 July 2008, the midpoints of the Bank's salary ranges were aligned with those observed market benchmarks and the estimated change in external market salaries in the intervening period. The latter adjustment, based on the rate of inflation in Switzerland and the weighted average real wage increase in industrial countries, amounted to 2.0%. Movements of salaries of individual staff members within the ranges of the salary structure are based on performance.

BIS staff members have access through the Bank to a contributory health insurance plan and a contributory defined benefit pension plan. Non-locally hired, non-Swiss staff members recruited for a position at the Bank's headquarters, including senior officials, are entitled to an expatriation allowance. In proportion to annual salary, it currently amounts to 14% for unmarried staff members and 18% for married staff members, subject to a ceiling. Expatriate staff members are also entitled to receive an education allowance for their children subject to certain conditions.[4] With regard to employment in the Representative Offices, a distinction is made between staff members transferred from the headquarters and staff members recruited directly for a position in a Representative Office. The employment conditions of transferred staff are determined in accordance with the Bank's international assignment policy. For staff recruited directly, employment conditions are aligned with those in the market in which the Office is located. Those staff members have access to the same health insurance and pension plans as staff engaged at the Bank's headquarters.

The salaries of senior officials are regularly benchmarked against compensation in comparable institutions and market segments. As with the survey for other staff, the most recent executive compensation survey took place in the second half of 2007. The results confirmed the appropriateness of the current practice of annually adjusting the salaries of senior officials for the rate of Swiss inflation.

As of 1 July 2008, the annual remuneration of senior officials, before expatriation allowances, is based on the following salary structure:

- General Manager[5] 739,400 Swiss francs
- Deputy General Manager 625,650 Swiss francs
- Heads of Department 568,770 Swiss francs

The Annual General Meeting approves the remuneration of members of the Board of Directors, with adjustments taking place every three years. The overall fixed annual remuneration paid to the Board of Directors amounts to a total of 1,049,520 Swiss francs as at 1 April 2009. In addition, Board members receive an attendance fee for each Board meeting in which they participate. Assuming the full Board is represented in all Board meetings, the annual total of these attendance fees amounts to 973,788 Swiss francs.

[4] Certain staff members who joined the Bank before 1997 receive an expatriation allowance of 25%, but are not entitled to receive an education allowance.

[5] In addition to the basic salary, the General Manager receives an annual representation allowance and enhanced pension rights.

Activities

Promotion of international financial and monetary cooperation: direct contributions of the BIS

Regular consultations on monetary and financial matters

Every two months, the Governors and other senior officials of the BIS member central banks convene for a series of meetings to discuss current developments and the outlook for the world economy and financial markets. They also exchange views and experiences on issues of special and topical interest to central banks. These bimonthly meetings, normally held in Basel, are one of the most important ways in which the Bank promotes cooperation within the central banking community. The November 2008 BIS bimonthly meetings took place in São Paulo and were hosted by the Central Bank of Brazil.

The bimonthly meetings comprise, in particular, the Global Economy Meeting and the All Governors' Meeting. The Global Economy Meeting, which brings together more than 30 Governors of key advanced and emerging market economies, monitors economic and financial developments and assesses the risks and opportunities in the world economy and financial markets.

The All Governors' Meeting, in which all shareholding member central bank Governors participate, discusses selected topics that are of general interest to all BIS member central banks. In 2008/09, the topics discussed were:

- the procyclicality of the financial system;
- the lessons of the global banking crisis;
- foreign currency liquidity pressures, dislocation in foreign exchange swap markets and central bank responses;
- money market interest rates and operational monetary policy targets; and
- central bank liquidity operations: lessons from the current turmoil.

Because not all central banks are directly involved in the work of the Basel-based committees and other organisations hosted by the Bank, the All Governors' Meetings also represent an opportunity to review the activities of these specialised groupings. In 2008/09, Governors discussed, for instance, the Basel Committee initiatives to respond to the financial crisis.

Other regular meetings that take place during the bimonthly gatherings are those of Governors of the G10 countries and of Governors of major emerging market economies, which explore themes that are of special relevance to the respective groups of economies. Governors who are members of the Central Bank Governance Group also meet on a regular basis.

In analysing issues related to financial stability, Governors meet with heads of supervisory agencies, other financial authorities and senior executives from the private financial sector. In particular, the Bank hosts regular joint meetings of Governors and heads of supervision; in 2008/09 this grouping discussed, among other topics, the enhancements to the Basel II Framework and specific areas in which the resiliency of the financial system could be strengthened.

The Bank regularly organises informal discussions among public and private sector representatives that focus on their shared interests in promoting a sound and well functioning international financial system. In addition, the Bank organises various other meetings for senior central bank officials on a regular or ad hoc basis. In a number of these meetings, other financial authorities, the private financial sector and the academic community are invited to contribute to the dialogue.

Other meetings organised for senior central bankers on a less frequent basis include:

- the meetings of the working parties on domestic monetary policy, held in Basel but also hosted on a regional basis by a number of central banks in Asia, central and eastern Europe, and Latin America; and
- the meeting of Deputy Governors of emerging market economies, for which this year's theme was "Monetary policy and the measurement of inflation: prices, wages and expectations".

Representative Offices

The Representative Office for Asia and the Pacific (Asian Office) and that for the Americas (Americas Office) aim to strengthen relations between the BIS and central banks and financial supervisory authorities in the respective regions, and to promote cooperation within each region. The Offices organise meetings, foster the exchange of information and data, and contribute to the Bank's financial and economic research. The Offices also help to deliver BIS banking services through regular visits to reserve managers in central banks and meetings at both technical and managerial levels.

Asia-Pacific

During the past year, the BIS responded to the needs of its Asian regional shareholders by organising high-level meetings and pursuing research on issues related to the ongoing financial turmoil. Drawing on the resources of the Asian research programme, the Asian Office held eight events, each organised jointly with a shareholding central bank or a regional central bank organisation:

- the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP)–BIS Forum on Foreign Exchange Markets, organised with the Bank of Japan, in Yokohama in July 2008;
- the Central Bank Workshop on the Microstructure of Financial Markets, organised with the Hong Kong Institute for Monetary Research, in Hong Kong SAR in September 2008;
- the Reserve Bank of India–BIS High-Level Seminar on Lessons from the Financial Crisis, in Hyderabad in December 2008;
- the EMEAP–BIS Forum on Foreign Exchange Markets, organised with the Bank of Japan, in Tokyo in December 2008;
- the South East Asian Central Banks (SEACEN)–BIS Executive Seminar on Global Shocks and Economic Stability, organised with Bank Indonesia, in Yogyakarta in January 2009;

- the Hong Kong Institute for Monetary Research–BIS Conference on Property Markets and Finance, in Hong Kong SAR in January 2009; and
- the Bank of Korea–BIS High-Level Seminar on Currency Internationalisation: Lessons from the Financial Crisis, in Seoul in March 2009.

In November 2008, the Financial Stability Institute (FSI) and the EMEAP Working Group on Banking Supervision convened their annual high-level meeting in Asia. Hosted by the People's Bank of China in Beijing, the meeting focused on the role of banking and banking supervision in financial stability. In addition, the FSI organised 10 seminars for financial sector supervisors in the Asian region that in most cases focused on topics and issues highlighted by the current financial crisis.

Banking activity and the Asian Bond Funds

The dealing room of the Asian Office continued to focus on meeting customers' needs as the financial crisis unfolded. Central banks in the region have maintained a cautious stance in their reserve portfolio management in the current strained environment.

As fund administrator, the BIS continued to provide support for public offerings of the bond funds under EMEAP's second Asian Bond Fund (ABF2) initiative. Eleven central banks provided seed money from their international reserves for funds invested in sovereign and quasi-sovereign bonds from eight EMEAP economies. The total size of the fund was $2.86 billion at the end of March 2009, down from $3.3 billion at the end of March 2008. Private sector investment decreased further to $427 million at the end of March 2009 from $765 million at the end of March 2008; central bank holdings, which stood at $2.43 billion, were down from $2.5 billion at the end of March 2008.

The fourth annual rebalancing of ABF2 was carried out in the final two months of 2008.

Negotiations are progressing to resolve the major outstanding issues on the China fund, one of the eight single-country funds which make up ABF2, with a view to launching an open-ended fund in China in the next few months. The BIS provided assistance to the fund manager at the suggestion of the EMEAP working group.

Asian Consultative Council and the BIS Special Governors' Meeting in Asia

The Asian Consultative Council (ACC), currently chaired by Zeti Akhtar Aziz, Governor of the Central Bank of Malaysia, provides Governors of shareholding central banks in Asia and the Pacific with a formal means of communicating with the BIS Board and Management. At the Council's two meetings this year, Governors focused their discussions on meetings to be organised and research to be carried out under the three-year Asian research programme (see below). The Governors reported their views on these matters to the BIS Board and Management, attaching priority to work related to policy issues raised by the global financial turmoil.

In February, the BIS once again organised a Special Governors' Meeting, this time hosted by the Central Bank of Malaysia in Kuala Lumpur, bringing together Governors from Asia-Pacific and elsewhere. Governors discussed

recent economic and financial developments and the lessons of the global financial crisis for financial stability in Asia and the Pacific.

Asian research programme

The three-year Asian research programme entered its final phase, with completion scheduled for August 2009. Developments in the region dictated that the programme devote considerable attention to the implications of the international financial crisis for Asia and the Pacific. Progress continues on a series of research projects that are intended to help regional authorities improve monetary policy and operations, develop financial markets, maintain financial stability and strengthen prudential policy.

By the end of the programme, collaborative research on topics of interest to central banks and supervisors in the region will have been organised with almost every shareholding central bank in Asia and the Pacific, as well as with regional organisations of central banks. This research has not only fed into the numerous meetings organised with regional central banks, but has also led to the publication of several articles in refereed journals and the Bank's *Quarterly Review*. Economists in the Asian research programme also wrote notes on special policy issues at the request of the ACC Governors. Two Asian research networks organised under the research programme held their second annual workshops in January. The success of the three-year programme has led to a decision to establish a stepped-up research presence in the region on a more permanent basis.

The Americas

Given the financial turmoil in major developed countries, the work of the Americas Office centred on closely monitoring developments that would indicate vulnerabilities in the region – in particular, spillovers to the economies of Latin America and the Caribbean.

BIS efforts in the region, as in recent years, were devoted not only to BIS member central banks but also to contacts and events with non-shareholding central banks, regulatory authorities and the academic community, which resulted in several publications. Noteworthy activities included the organisation of a panel discussion with regional central bank Governors as well as several parallel sessions at the annual meeting of the Latin American and Caribbean Economic Association (LACEA) in Brazil. The Office also co-organised the second regional BIS meeting of heads of internal audit, held in cooperation with the Central Bank of Chile, hosted a regional meeting of central bank general counsels in Mexico City and contributed to BIS meetings hosted by regional central banks, such as the Working Party on Monetary Policy in Latin America, convened at the Colombian central bank.

The Americas Office also supported FSI regional events and a BIS seminar on "Financial stability analysis and reports", organised with the Centre for Latin American Monetary Studies (CEMLA). The Office contributed research and speakers to events organised by the Central Bank of Brazil, Bank of Canada and Central Reserve Bank of Peru as well as the Caribbean Centre for Money and Finance, the Association of Supervisors of Banks of the Americas,

the Fondo Latinoamericano de Reservas, the International Association of Deposit Insurers, the International Monetary Fund and the United Nations.

Consultative Council for the Americas (CCA)

In May 2008, the Bank established the Consultative Council for the Americas (CCA) as an advisory committee to the Board. The CCA, which is currently chaired by Martín Redrado, Governor of the Central Bank of Argentina, comprises the Governors of the BIS member central banks in the Americas. Its purpose is to provide a vehicle for direct communication between the BIS member central banks in the Americas and the BIS Board and Management on matters of interest to the central bank community in the region. The Americas Office provides secretariat support to the CCA.

The CCA met for the first time on the occasion of the BIS Annual General Meeting in June 2008 and has held two subsequent meetings. CCA members are regularly informed of the work of the BIS and the Americas Office in the region and are invited to comment on ongoing work.

Financial Stability Institute

The mandate of the Financial Stability Institute (FSI) is to assist financial sector supervisory authorities worldwide in strengthening oversight of their financial systems, thereby fostering financial stability globally. The FSI conducts a programme designed to disseminate standards and sound practices primarily to the banking and insurance supervision sectors. The work of the FSI benefits from the fact that the BIS hosts the standard-setting bodies for banking and insurance supervision. The synergies and consultations that arise from this close proximity have come to be referred to as the Basel Process, described in the next section.

Meetings, seminars and conferences

The first component of the FSI programme is the long-standing series of high-level meetings, seminars and conferences held both in Basel and at venues in various regions of the world. In 2008, the FSI organised a total of 50 events. While these continued to cover a broad range of financial sector topics, emphasis was placed on issues related directly to financial stability. More than 1,850 representatives of central banks and banking and insurance supervisory authorities participated. The FSI also continued its series of high-level meetings for Deputy Governors and heads of supervisory authorities, with such meetings taking place in Africa, Asia, Latin America and the Middle East. These meetings focused on the financial crisis as well as Basel II implementation and other key supervisory issues.

FSI Connect

The second component of the FSI programme is FSI Connect, an online information resource and learning tool for financial sector supervisors. FSI Connect includes more than 160 tutorials covering a wide range of topics for supervisors at all levels of experience and expertise. More than 170 central

banks and supervisory authorities subscribe to FSI Connect, representing approximately 8,000 users. In 2008, with the endorsement of the International Association of Insurance Supervisors, BIS Management approved a second phase of development to specifically address insurance sector supervision. Approximately 25 tutorials will be developed over the next few years, dealing with insurance risks and related supervisory issues and techniques. Moreover, with the support of the International Association of Deposit Insurers, several tutorials related to deposit insurance will be added to FSI Connect over the course of 2009. These two initiatives will further enhance the BIS's contribution to financial sector stability.

Other major initiatives

In 2008, the FSI updated its 2004 and 2006 surveys on Basel II implementation efforts in non-Basel Committee member countries. Consistent with the results of the previous surveys, the 2008 survey indicates that Basel II will be implemented by the overwhelming majority of the 101 respondents to the most recent survey. Including Basel Committee countries, nearly 90 jurisdictions planned to implement Basel II by the end of 2008. One difference from the preceding two surveys is the increased number of countries permitting their banks to implement the more advanced approaches for credit and operational risk.

FSI: www.bis.org/fsi

Promotion of international financial and monetary cooperation: the Basel Process

One of the main ways in which the BIS contributes to promoting international financial and monetary stability is through cooperation of the committees and standard-setting bodies hosted by the BIS and located in Basel. This approach is increasingly referred to as "the Basel Process" for the promotion of international financial and monetary cooperation.

The Basel Process is based on four key ingredients:

- First, the BIS hosts, and provides staff and financial resources for, a number of committees that address the key elements of financial stability. These include the Basel Committee on Banking Supervision, which is concerned with supervision at the level of individual institutions; the Committee on the Global Financial System, which monitors macrofinancial stability issues; the Markets Committee, which examines the functioning of financial markets; and the Committee on Payment and Settlement Systems, which examines the payments infrastructure. In addition, the International Association of Insurance Supervisors and the International Association of Deposit Insurers are hosted by the BIS. Furthermore, most of the Basel-based committees contribute to the work of the Financial Stability Board, also hosted by the BIS. The synergies created by physical proximity and the resulting exchange of ideas among these groups have been considerable.
- Second, the flexibility of these groups and the openness in the exchange of information among policymakers enhance the coordination of their

work on financial stability issues and help avoid overlaps and gaps in their work programmes. At the same time, their output is much larger than their size would suggest, as they are able to leverage the expertise of the international community of central bankers, financial regulators and supervisors.

- Third, the work of the Basel-based committees is informed by the analytical and statistical inputs of the BIS's economic research and its banking activities, in particular through the Banking Department's working relationships with market participants and the implementation of regulatory standards and financial controls for the conduct of banking operations.
- Finally, dissemination of the standard-setting bodies' work is facilitated by the FSI.

The activities of each of the committees and standard-setting bodies during the past year are reported below.

The permanent committees hosted by the BIS

Basel Committee on Banking Supervision

The Basel Committee on Banking Supervision, chaired by Nout Wellink, President of the Netherlands Bank, seeks to improve supervisory understanding and the quality of banking supervision worldwide. It provides a forum for dialogue among supervisors by exchanging information on national supervisory arrangements, by improving the effectiveness of techniques for supervising international banking business, and by setting minimum supervisory standards in areas where they are considered desirable.

Responses to the financial crisis

Based on its assessment of the supervisory, regulatory and risk management weaknesses revealed by the crisis, the Basel Committee established a comprehensive strategy to address the lessons in these areas. The Committee initiated and in some cases accelerated work related to a variety of supervisory and risk management topics, including liquidity risk, stress testing and bank valuation practices. The market turmoil also provided important lessons that have helped guide the Basel Committee in further strengthening the Basel II Framework and other elements of capital adequacy regulation. Taken together, these initiatives are a core element of global efforts to strengthen the resilience of the banking and broader financial system.

Strengthening capital adequacy

The crisis has underscored the importance of a strong capital base for a robust banking sector. In its work on capital adequacy, the Committee's goal is to raise the level and quality of capital in the banking system so as to increase banks' resilience to future episodes of economic and financial stress and enhance confidence in the global banking system. This work includes developing ways to mitigate procyclicality, for example by promoting capital buffers above the regulatory minimum that can be drawn upon during periods

of stress. These efforts also support the initiatives and recommendations of the Financial Stability Board and the G20 leaders.

The Basel II Framework

In response to market events, the Basel Committee undertook a review of the Basel II Framework in 2008 to identify areas that could be strengthened. Based on this review, the Committee issued a package of consultative documents in January 2009.

The proposed enhancements, which the Committee expects to finalise in the course of 2009, will help ensure that the risks inherent in banks' portfolios related to trading activities, securitisations and exposures to off-balance sheet vehicles are better reflected in minimum capital requirements, risk management practices and accompanying disclosures to the public. The Committee intends to coordinate and implement this work programme in a manner that strengthens financial confidence and avoids aggravating current market conditions. It will not recommend increasing required global minimum capital ratios during periods of economic and financial stress.

The January 2009 consultative package set out enhancements to minimum capital requirements (Pillar 1) that focus on strengthening the risk coverage of the Framework, including the regulatory capital treatment for trading book exposures. Most of the build-up of leverage prior to the financial crisis, and the majority of losses since the crisis began, occurred in banks' trading books. An important contributing factor was that the current capital framework for market risk, based on the 1996 amendments to Basel I, does not capture some key risks. In response, the Committee proposed supplementing the current value-at-risk trading book framework with an incremental risk charge (IRC), which includes default risk as well as migration risk. Once implemented, the IRC will reduce the incentive for regulatory arbitrage between the banking and trading books.

An additional proposed response is the introduction of a stressed value-at-risk requirement, which will help reduce the procyclicality of the minimum capital requirements for market risk. The Committee announced that it will conduct a longer-term, fundamental review of the capital framework for trading activities.

The crisis has clearly shown that collateralised debt obligations consisting of asset-backed securities (CDOs of ABS – so-called "resecuritisations") are more highly correlated with systematic risk than traditional securitisations. Resecuritisations therefore warrant a higher capital charge as proposed in the January 2009 consultative package.

Prior to the onset of the financial crisis, banks had built up significant exposures to off-balance sheet conduits, which were not adequately reflected in the capital regime. In response, the Committee proposed an increase in capital requirements for liquidity lines extended to support asset-backed commercial paper conduits by eliminating the distinction between short-term and long-term liquidity facilities. The Committee also proposed a requirement that banks obtain comprehensive information about the underlying exposure characteristics of their externally rated securitisation

positions. Failure to obtain such information would result in higher capital requirements.

Through the supervisory review process (Pillar 2) of the Basel II Framework, the Committee also introduced standards to promote more rigorous supervision and risk management of risk concentrations, off-balance sheet exposures, securitisations and related reputational risks. It further proposed improvements to valuations of financial instruments, the management of funding liquidity risks and firm-wide stress testing practices.

Moreover, the Committee introduced enhanced disclosure requirements to promote better market discipline. These Pillar 3 requirements relate to securitisations and sponsorship of off-balance sheet vehicles and should provide market participants with a better understanding of an institution's overall risk profile.

Procyclicality

An additional dimension of the Committee's capital-related work concerns procyclicality. In 2008, the Committee initiated a comprehensive, top-down review of the capital levels and cyclicality implied by the Basel II Framework, taking into account the interaction with broader macroprudential objectives. The aim is to promote adequate capital buffers over the credit cycle and to mitigate the risk that excessive cyclicality of the minimum capital requirement amplifies the procyclicality of the financial system.

The Committee has put in place a comprehensive capital monitoring framework to track the impact of Basel II on the minimum required and total capital levels and the procyclicality of those levels.

With a particular focus on the composition of Tier 1 capital, the Committee is evaluating ways to build additional buffers above the regulatory minimum that can be drawn upon in stress conditions. It also initiated a review of the treatment of loan loss provisions under Basel II and ways to strengthen incentives to raise such provisions in good times.

In 2008/09, the Committee also began an evaluation of concrete ways to supplement the Basel II risk-based capital framework with a simple, transparent measure of gross exposure, such as a leverage ratio. Such a measure could provide an independent measure of risk and capital, help contain leverage and put a simple floor under the risk-based measure.

Liquidity risk management and supervision

The market turmoil re-emphasised the importance of liquidity to the functioning of financial markets and the banking sector. In response, the Basel Committee in September 2008 issued enhanced global *Principles for sound liquidity risk management and supervision*, which were endorsed by bank supervisors meeting at the biennial International Conference of Banking Supervisors.

The sound liquidity principles support one of the key recommendations for strengthening prudential oversight set out in the April 2008 *Report of the Financial Stability Forum on enhancing market and institutional resilience*. The principles were designed to strengthen banks' liquidity risk management.

They focus on the governance, measurement and management of banks' liquidity risk and require that banks maintain a strong liquidity buffer. A formal assessment of implementation will take place in 2009.

The Basel Committee is also working to promote greater consistency in liquidity risk supervision. This includes the potential for harmonised supervisory benchmarks and metrics, and increased information sharing between supervisors of cross-border banks.

Stress testing

The financial crisis has demonstrated the importance of stress testing as an integral part of any bank's risk management, liquidity and capital planning process. This tool plays a critical role in strengthening not only bank corporate governance but also the resilience of individual banks and the financial system. To address weaknesses in stress testing, the Basel Committee issued a consultative paper entitled *Principles for sound stress testing practices and supervision* in January 2009.

The paper presents principles for the governance, design and implementation of stress testing programmes at banks. It defines expectations for the role and responsibilities of supervisors in reviewing firms' stress testing practices, and emphasises that a sound stress testing programme should, among other things, be directed by the board and senior management, provide forward-looking assessments of risk, and be an integral part of capital and liquidity planning.

Bank valuation practices

The Basel Committee concluded that, while current valuation practices and processes were not the underlying cause of the market turmoil, they contributed to it and amplified its effects. In April 2009, the Committee issued *Supervisory guidance for assessing banks' financial instrument fair value practices*. The guidance strengthens banks' valuation processes for financial instruments. It will help supervisors assess the rigour of banks' valuation processes and promote improvements in risk management and control practices.

Implementation of standards

The financial crisis has highlighted the importance of prudent, informed standards and supervisory guidance. In response, the Basel Committee announced in January 2009 that it was broadening the mandate of its Accord Implementation Group (AIG), which had focused on implementation of the Basel II Framework. The AIG was renamed the Standards Implementation Group (SIG), and its focus is on promoting the implementation of Basel Committee guidance and standards more generally, in an internationally coordinated and consistent manner.

Supervisory cooperation for cross-border banks

In 2008, the Committee evaluated the various issues associated with the resolution of complex global banking organisations. Further examination and

a detailed consideration of individual bank failures and rescues are necessary. The Committee's final report in September 2009 will draw the lessons of the current crisis for bank resolution mechanisms and their application across borders.

Core Principles for Effective Deposit Insurance Systems

In March 2009, the Basel Committee and the International Association of Deposit Insurers issued a consultative document on *Core Principles for Effective Deposit Insurance Systems*. The Core Principles respond to one of the lessons of the financial crisis: the need for effective systems of deposit insurance to help maintain public confidence. They set an important benchmark for countries to use in establishing or reforming deposit insurance systems and address a range of issues, including deposit insurance coverage, funding and prompt reimbursement. They also address issues related to public awareness, resolution of failed institutions and cooperation with other safety net participants.

Expanded membership and outreach

In 2009, the Basel Committee and its governance body – central bank Governors and heads of supervision – agreed to expand the Committee's membership and invite representatives from Argentina, Australia, Brazil, China, Hong Kong SAR, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, Singapore, South Africa and Turkey to join. The Committee believes that this expansion in membership will enhance its ability to carry out its core mission.

Basel Committee: www.bis.org/bcbs

Committee on the Global Financial System

The Committee on the Global Financial System (CGFS), chaired by Donald L Kohn, Vice Chairman of the Board of Governors of the Federal Reserve System, monitors financial market developments and analyses their implications for financial stability.

The deepening financial crisis shaped the Committee's work in the period under review. The CGFS discussed in particular:

- the condition of international banks and their responses to growing pressure on funding and capital;
- the consequences of dysfunctional credit markets and the broader economic impact of disruption in credit supply;
- changes in the supply of cross-border bank financing in response to the crisis; and
- government and central bank support measures and their impact on financial market conditions.

In addition, the Committee established various groups to review specific aspects of the financial crisis. A joint CGFS–Financial Stability Forum working group investigated the role of valuation and leverage in the procyclicality of the financial system. This topic was also discussed at a roundtable with private sector participants and accounting standard setters in Paris. A second group has been asked to examine, jointly with the Markets Committee, central

bank credit policies. The CGFS also established a group to review possible enhancements to credit risk transfer statistics collected under its auspices.

In mid-2008, the CGFS published three reports that analyse issues pertinent to the financial crisis: developments in private equity and leveraged finance markets; central bank operations in response to the financial turmoil; and the role of ratings in structured finance. A January 2009 report, *Capital flows and emerging market economies*, includes a preliminary assessment of the impact of the financial crisis on major emerging market economies.

CGFS: www.bis.org/cgfs

Committee on Payment and Settlement Systems

The Committee on Payment and Settlement Systems (CPSS), chaired by William C Dudley, President and Chief Executive Officer of the Federal Reserve Bank of New York, contributes to the strengthening of financial market infrastructure by promoting safe and efficient payment and settlement systems.

During the year, the Committee published two reports:

- *The interdependencies of payment and settlement systems*, which identifies the various interconnections that exist among systems, analyses the risk implications of the resulting interdependencies, and assesses the associated risk management challenges. The report concludes that tighter interdependencies among systems have helped to strengthen the global infrastructure by reducing several sources of settlement costs and risks but have also increased the potential for disruptions to spread quickly and widely. The report therefore suggests a number of actions that industry participants, as well as central banks and other authorities, could take to adapt their policies to the increasingly interconnected nature of systems.
- *Progress in reducing foreign exchange settlement risk*, which concludes that, while much progress has been made, potentially significant risk remains. It therefore recommends actions to be taken by individual institutions, industry groups and central banks. These actions include working with banking supervisors and other regulators to explore options that could ensure that banks apply appropriate risk management procedures to their foreign exchange settlement exposures.

The CPSS also:

- identified potential actions that central banks could take, on an individual or coordinated basis, to strengthen their operational readiness to provide cross-border liquidity in emergencies;
- cooperated with the Basel Committee to identify sound practices for banks' management of intraday liquidity risks, as described in the Basel Committee's *Principles for sound liquidity risk management and supervision*; and
- monitored the impact of the financial crisis on the functioning of payment and settlement systems and continued to share information on the clearing of over-the-counter derivatives transactions.

The Committee continued to enhance cooperation among central banks, including those of emerging market economies. It also provided support and

expertise to workshops and seminars on payment system issues organised by the BIS in cooperation with regional central banking organisations.

CPSS: www.bis.org/cpss

Markets Committee

The Markets Committee, chaired by Hiroshi Nakaso, Executive Director of the Bank of Japan, serves as a forum for major central banks to jointly monitor developments in financial markets and discuss the specifics of their market operations. It brings together senior officials responsible for market operations.

Dislocations in money, credit and foreign exchange markets, and central bank initiatives to alleviate them, remained at the centre of the Committee's discussions in the past year. Steps were taken to further enhance the technical cooperation among its members, including: more frequent and detailed discussions about market developments; timely exchanges of information in periods of tension; discussions of measures to address market dislocations; and sharing of documentation to deepen the common understanding of central banks' operational frameworks. Furthermore, the *Compendium on monetary policy frameworks and central bank market operations* was updated. The Committee was also involved in the preparation of the CGFS report on *Central bank operations in response to the financial turmoil*, published in July 2008. Recently, a Markets Committee study group was asked to examine central bank credit policies, together with the CGFS.

In addition to its bimonthly meetings, the Committee held special meetings, sometimes with the private sector, to address topics of a more structural nature, such as changes in commodity markets or the spillover of the financial crisis to emerging markets. The Committee organised its second Working Party on Markets in Latin America with central banks and market participants from the region in November 2008.

Markets Committee: www.bis.org/markets

Central Bank Counterfeit Deterrence Group

The Central Bank Counterfeit Deterrence Group (CBCDG) is mandated to investigate threats to the security of banknotes and to propose common solutions for implementation by note-issuing authorities. The CBCDG has developed anti-counterfeiting features to prevent banknote images from being replicated by colour copiers and digital technology (personal computers, printers and scanners). The BIS supports the work of the CBCDG by hosting its Secretariat and by acting as its agent in contractual arrangements.

BIS contributions to broader international financial cooperation

Group of Ten

The Bank continued to contribute to the work of the G10 Finance Ministers and central bank Governors by participating as an observer institution and providing

secretariat support. During the year under review, the Group operated under the Chairmanship of the Dutch Minister of Finance. As no meetings were held during the year, written procedures were used to address questions relating to performance-related compensation and financial stability.

Financial Stability Board

The Financial Stability Board (FSB), which was established in April 2009 as the successor to the Financial Stability Forum (FSF), promotes international financial stability through enhanced information exchange and cooperation in financial supervision and surveillance. Specifically, the mandate of the FSB is to:

- assess vulnerabilities affecting the financial system, and identify and oversee action needed to address them;
- promote coordination and information exchange among authorities responsible for financial stability;
- monitor and advise on market developments and their implications for regulatory policy;
- advise on and monitor best practice in meeting regulatory standards;
- undertake joint strategic reviews of the policy development work of the international standard-setting bodies to ensure that their work is timely, coordinated and focused on priorities and is addressing gaps;
- set guidelines for supervisory colleges, support their establishment and functioning, and encourage participation in them, including through ongoing identification of the most systemically important cross-border firms;
- support contingency planning for cross-border crisis management, particularly with respect to systemically important firms; and
- collaborate with the IMF to conduct early warning exercises.

The FSB is chaired by Mario Draghi, Governor of the Bank of Italy. Its Secretariat is located in Basel and hosted by the BIS.

In accordance with the FSF's decision in March 2009 to expand its national membership, the FSB comprises senior officials from finance ministries, central banks and financial regulators in 24 countries and territories as well as from the ECB and the European Commission. It also includes representatives of international financial institutions (the BIS, IMF, OECD and World Bank), international supervisory, regulatory and standard-setting bodies (the Basel Committee, the International Association of Insurance Supervisors (IAIS), the International Accounting Standards Board (IASB) and the International Organization of Securities Commissions (IOSCO)) and central bank expert groupings (CGFS and CPSS).

At the FSF's plenary meetings – in September 2008 in Amsterdam, December 2008 in Hong Kong SAR and March 2009 in London – members discussed the current challenges and vulnerabilities in financial markets, the steps that are being taken to address them and policy options. The September 2008 meeting also featured an exchange of views with private sector representatives on current financial system risks and response measures. In addition to its plenary meetings, the Board holds occasional regional

meetings to foster wider exchanges of views on financial vulnerabilities and relevant policy work under way. A meeting bringing together members and authorities from the Asia-Pacific region was held in Hong Kong SAR in December 2008. An outreach meeting with authorities from selected emerging economies, organised jointly with the IMF, was held in Washington in October 2008.

The FSF's April 2008 *Report on enhancing market and institutional resilience* called for international action to mitigate the procyclicality of the financial system. In June 2008, the FSF initiated three workstreams on procyclicality issues, focusing on: (i) the capital regime (jointly with the Basel Committee); (ii) bank provisioning practices; and (iii) the interaction between leverage and valuation (jointly with the CGFS). The Action Plan adopted by the G20 leaders at their November 2008 summit also called for the FSF to develop recommendations to mitigate procyclicality. The recommendations arising from these workstreams were published, together with supporting commentary and analysis, in April 2009. Among other things, the FSF recommended that:

- the Basel Committee strengthen the capital framework so that the level as well as the quality of capital rise in good times and can be drawn on in downturns;
- risk-based capital requirements be supplemented with a simple, transparent measure to contain leverage in the financial system;
- accounting standard setters reconsider the incurred loss model for provisioning by analysing alternative approaches for recognising and measuring loan losses and examine the feasibility of valuation reserves or adjustments for fair value financial instruments under certain circumstances; and
- the Basel Committee and the CGFS launch a joint research programme to measure funding and liquidity risk attached to maturity transformation.

Also following upon recommendations in its April 2008 report, the FSF developed principles to guide compensation practices at financial institutions, high-level principles for cross-border crisis management, protocols for establishing international colleges of supervisors for large cross-border banks, and an enhanced early warning process for identifying and mitigating global systemic risks (the last in collaboration with the IMF). These initiatives were also called for in the G20 Action Plan released on 2 April 2009. The principles for compensation and cross-border crisis management were published in April 2009. Supervisory colleges for most large cross-border financial institutions had been set up by the end of 2008, with the remainder expected to be established in the first half of 2009. The conclusions of the IMF-FSF inaugural early warning exercise were presented to the IMF's International Monetary and Financial Committee at its April 2009 meeting.

In addition to these initiatives, the FSF oversaw the implementation of the other recommendations in its April 2008 report by national authorities, international bodies and standard setters, and the private sector. The FSF reported on progress in implementing the recommendations to the G7 Finance Ministers and Governors in October 2008, and a second progress

report was issued in April 2009. Both reports concluded that, while most of the recommendations were being successfully implemented in a timely manner, further work remains to be done in some areas and continued monitoring will be essential.

FSB: www.financialstabilityboard.org

International Association of Insurance Supervisors

The International Association of Insurance Supervisors (IAIS), hosted by the BIS since 1998, is the international standard-setting body for prudential supervision of the insurance industry. The IAIS aims to contribute to global financial stability through improved supervision of the insurance industry, the development of standards for supervision, international cooperation based on exchange of information, and mutual assistance. Over recent years, the IAIS has grown significantly.

The IAIS has been actively involved in assessing the impact of the financial crisis on the insurance sector and responding to the FSB and G20 recommendations for regulatory reforms. With a view to further improving the effectiveness and efficiency of insurance supervision on a global basis, the IAIS has mapped weaknesses revealed by the crisis.

The Basel Committee, IOSCO and the IAIS, through the Joint Forum, their joint working group, have put in place a framework and process to carry out a stocktake of the issues pertaining to regulatory gaps and differences that build on existing work and processes in each sector.

Accounting

The IAIS has a strong interest in ensuring high-quality financial reporting that offers a meaningful, economically sound portrayal of insurers' financial health. It closely monitors the international financial reporting developments which will most influence the overall accounting model for regulated insurance enterprises. In 2008, the IAIS provided input to the IASB's discussion papers on reducing complexity in reporting financial instruments and on amendments to IAS 19 employee benefits. The IAIS also provided comments on the International Federation of Accountants' exposure draft on using the work of an "auditor's expert" and on international auditing standards of most relevance to the insurance sector.

Capital adequacy and solvency

In October 2008, the IAIS adopted six supervisory papers on solvency assessment. Aimed at facilitating greater comparability and convergence in the international assessment of insurer solvency, these papers consist of standards and guidance on:

- the structure of regulatory capital requirements for a solvency regime;
- the establishment and ongoing operation of an enterprise risk management framework; and
- the use of internal models as a method to assess risk, both quantitatively and qualitatively, and manage capital.

Group supervision

Recognising the growing internationalisation of the insurance market and the reality that much insurance business is undertaken within a group structure, the IAIS has made progress in developing a comprehensive framework for streamlining group supervision. The main goal is to achieve efficient group supervision which preserves the level of policyholders' protection while avoiding unnecessary supervisory burden. In October 2008, the IAIS adopted papers on:

- principles of group-wide supervision, focusing on its aims and the mechanisms to achieve them; and
- guidance on the role and responsibilities of a group-wide supervisor, including the factors to consider in identifying one, as well as the range of cooperation mechanisms.

Reinsurance

Reinsurers play an important role in the functioning of efficient insurance markets through their shock-absorbing capacity. In October 2008, the IAIS adopted a guidance paper on mutual recognition of reinsurance supervision.

In December 2008, the IAIS published the fifth edition of its *Global reinsurance market report*, based on global reinsurance statistics submitted by the world's largest reinsurers. Over the years, the report has evolved from facilitating reinsurance market transparency on an ongoing basis to providing a foundation on which up-to-date coverage of market trends and developments can be analysed and reported. It shows that the reinsurance industry has a solid financial base to face the challenges of the continuing financial crisis. However, if the impact of the crisis spreads, reinsurers may be confronted with difficult market and credit conditions.

Information sharing

Following the adoption of a *Multilateral memorandum of understanding* (MMOU) in February 2007, which defines a set of principles and procedures for sharing information, views and assessments, the IAIS commenced validation of applications from interested jurisdictions.

Training

Each year, the IAIS organises some 15 regional seminars and workshops to assist insurance supervisors in implementing its principles and standards, in collaboration with the FSI, national insurance supervisory authorities and other bodies.

IAIS: www.iaisweb.org

International Association of Deposit Insurers

The International Association of Deposit Insurers (IADI) contributes to the stability of financial systems by promoting international cooperation and encouraging wide international contact among deposit insurers and other interested parties. In particular, IADI:

- enhances the understanding of common interests and issues related to deposit insurance;
- sets out guidance to enhance the effectiveness of deposit insurance systems;
- facilitates the sharing of expertise on deposit insurance issues through training, outreach and educational programmes; and
- provides guidance on the establishment or enhancement of effective deposit insurance systems.

Currently, 72 organisations (of which 52 are members) from around the world are involved in IADI's activities, including a number of central banks that have an interest in promoting the adoption or operation of effective deposit insurance systems.

One of the Association's main objectives is to improve the effectiveness of deposit insurance systems through the development of principles and practices. In its April 2008 *Report on enhancing market and institutional resilience*, the FSF called on authorities to agree on an international set of core principles for effective deposit insurance systems. Subsequently, the Basel Committee and IADI issued a consultative document on *Core Principles for Effective Deposit Insurance Systems* for public consultation.

In response to a request from the G20 leaders for information on areas where progress on convergence in deposit insurance is being made or is in need of acceleration, IADI briefed the FSF on regulatory practices related to deposit insurance and transitioning to an explicit, limited-coverage deposit insurance system.

During its seventh year of operation, IADI continued to provide many forums for deposit insurers and other safety net participants. Activities included:

- the Seventh Annual Conference, themed "The role of deposit insurance in promoting financial stability and economic inclusion" and attended by over 250 deposit insurers and policymakers from 60 countries. The conference focused on: current financial market challenges and implications for financial institutions; the role of deposit insurers in financial crises; past, present and future research and guidance; and the building of inclusive financial sectors to ensure that low-income individuals have access to financial services;
- an IADI Executive Training Program, held in the United States and Asia, on major issues in bank resolution. The Program covered the least cost test for determining a bank resolution alternative, large and small bank resolutions, and the use of bridge banks and conservatorships during the resolution process;
- an agreement with the FSI to provide online tutorials on deposit insurance;
- collaboration with the European Forum of Deposit Insurers on training and other areas of mutual interest to support deposit insurance schemes in Europe;
- establishment of an Advisory Forum of 17 deposit insurance experts to comment on research and guidance papers before publication; and

- publication of guidance papers on governance, public awareness and funding.

  IADI: www.iadi.org

Other areas of central bank cooperation promoted by the BIS

Central bank governance

The Central Bank Governance Group comprises Governors from a broadly based and representative group of central banks. It is assisted by the Central Bank Governance Network, which encompasses nearly 50 central banks and monetary authorities that cooperate via the BIS to share information on governance and organisational matters.

Through the BIS, the Group worked on understanding issues in the governance of central banks as public policy institutions. In May 2009, it released a report on *Issues in the governance of central banks* that is intended to serve as a point of reference when decisions are made on governance arrangements for central banks. The report notes a number of governance implications that may flow from changes in the role of the central bank with respect to achieving and maintaining financial stability. These questions include the range and nature of central banks' responsibilities for promoting financial stability and the design of mechanisms for decision-making on financial stability matters.

Work on the dynamics of monetary policy committees was also completed during the year. The purpose of this workstream was to understand how structural features and committee procedures shape the decision-making process. In addition, various requests for comparative information on a range of central bank governance issues were met, and multilateral and bilateral consultations were held with a number of central banks.

Research activities

In addition to providing background material for meetings of senior central bankers and secretariat and analytical services to committees, the BIS contributes to international monetary and financial cooperation by carrying out its own research and analysis on issues of interest to central banks and, increasingly, financial supervisory authorities. This work finds its way into the Bank's regular publications, such as the *Annual Report*, the *Quarterly Review* and the *BIS Papers* and *Working Papers* series, as well as external professional publications. Most of the Bank's research is published on its website (www.bis.org).

In line with the Bank's mission, the long-term focus of the research is on monetary and financial stability issues. A core theme of the work during the period under review was the global financial crisis. The research explored the various dimensions of the crisis, including its causes, dynamics and policy implications. In particular, this work analysed the behaviour of financial markets under stress and the transmission of strains through international

banking markets. Special attention was also paid to advancing the macroprudential approach to financial regulation and supervision, which addresses the financial system as a whole rather than individual institutions. The work included the development of early warning indicators of banking system distress and an analysis of ways to dampen the procyclicality of the financial system. Some of this work was channelled into the FSF report on procyclicality published in April 2009.

As part of its research activities, the BIS also organises conferences and workshops, typically bringing together senior policymakers, leading academics and market participants. In June 2008, the Seventh BIS Annual Conference addressed the challenges to monetary policy in the decade ahead. The BIS and the Centre for Economic Policy Research (CEPR) organised a conference in Basel in September 2008 on the transmission mechanism of monetary policy.

Cooperation in the statistical area

The monitoring and analysis of the financial crisis require timely, reliable and internationally comparable economic, monetary and financial statistics. The BIS benefits significantly from the various international statistical activities it has been involved in for some time with respect to data collection, methodological issues and technical solutions.

International financial statistics

The various unique datasets compiled and disseminated by the BIS in cooperation with central banks are of particular interest in the current financial turmoil. The quarterly banking statistics permit a detailed examination of developments in the international banking markets, including the dollar funding needs of banks outside the United States and cross-border bank lending among major financial centres and to emerging markets. The semiannual over-the-counter (OTC) derivatives statistics, which also cover outstanding credit default swaps (CDS), provide a key source for understanding the major trading patterns and potential exposures in this systemically important market. The securities statistics, covering both international and domestic markets, indicate the impact of the credit market turmoil on issuance activities in these markets. The banking and securities statistics feed the Joint External Debt Hub established by the BIS in cooperation with the IMF, OECD and World Bank; the Hub now includes new trade credit data from the International Union of Credit and Investment Insurers (the Berne Union).

Efforts were made last year to clarify the guidelines for reporting central banks with the aim of further improving consistency within and across BIS datasets. The BIS also contributed to the discussion about how its OTC derivatives statistics, in particular those related to credit risk transfers through CDS, could be adapted to enable better monitoring of market developments. Moreover, the Bank made a major contribution to the drafting of the *Handbook on securities statistics*, sponsored by the Working Group on Securities Databases, whose members are the BIS, ECB, IMF and

OECD.[6] Finally, the Bank strengthened its cooperation with these and other international institutions on statistical methodological and data compilation issues: in particular, it joined the new Inter-Agency Group on Economic and Financial Statistics, which aims to improve the availability of key national and international data in response to the ongoing financial and economic crisis.

Irving Fisher Committee on Central Bank Statistics

The BIS hosts the Secretariat of the Irving Fisher Committee on Central Bank Statistics (IFC). The Committee is a forum for users and compilers of statistics, both within and outside central banks, to discuss statistical issues relating to economic, monetary and financial stability. It currently has 64 full institutional members, including all BIS shareholding central banks, and is chaired by Manuel Marfán, Board Member of the Central Bank of Chile.

The IFC's fourth biennial conference, held in Basel in August 2008, addressed the topic "Measuring financial innovation and its impact". About 150 economists and statisticians from central banks around the world participated. The conference included a discussion on data issues revealed by the recent financial turmoil. It concluded that the lack of anticipation of the crisis was not caused by insufficient data on, for instance, economic and financial imbalances. A number of gaps could nonetheless be singled out. These gaps would take time to fill, and innovative approaches might have to be adopted to address the information needs of policymakers and market participants in the meanwhile. Proceedings of IFC meetings are published in the *IFC Bulletin* and posted on the BIS website.

BIS Data Bank

The BIS Data Bank is now used by 53 BIS shareholding central banks to exchange national data with each other (12 additional central banks joined during the year). Data Bank coverage was expanded to include high-frequency data on central bank money market operations, which are being closely monitored and discussed by various Basel-based groups during the financial crisis; data on food and energy prices were also added. Furthermore, steps were taken to facilitate the reporting of available data on national debt securities following the release of a conceptual framework in the *Handbook on securities statistics*.

In May 2008, 38 central banks were represented at the regular Data Bank Experts meeting. Issues on the agenda included improving the timeliness of data submissions and the need to save the original as well as all subsequent revisions of monetary and economic data in order to permit a proper historical analysis of the background against which market reactions occur and policy decisions are made.

[6] The first part of the Handbook was posted on the IMF website in May 2009. It provides a conceptual framework, anchored in existing international statistical standards, for position and flow statistics on debt securities issues. Eventually this document will be expanded to cover debt securities holdings and other types of securities.

Statistical information technology

Last year, the BIS finalised the implementation of a new database for its international financial statistics and prepared a new search and download facility for its data on the web. In doing so, the BIS continued to work very closely with central banks to make the exchange, processing and dissemination of statistical data and metadata more efficient. A major initiative in this regard is the Statistical Data and Metadata Exchange (SDMX), a joint effort of the BIS, ECB, Eurostat, IMF, OECD, United Nations and World Bank.[7] More than 240 experts from 65 countries and nearly 20 international organisations came together at the SDMX Global Conference held in Paris in January 2009. The conference illustrated the broad acceptance of SDMX and the need for an electronic community for SDMX on the internet. Many national and international statistical organisations are keen to implement SDMX in order to improve the dissemination of their statistical data.

The SDMX website (www.sdmx.org) provides the family of SDMX products, including technical standards approved by the International Organization for Standardization, content-oriented guidelines for exchange of data and metadata, and implementation tools. The site also provides information about SDMX-related developments in a growing number of statistical subject areas, such as the balance of payments and external debt.

Group of Computer Experts

The Group of Computer Experts (GCE) provides a twice-yearly forum for central banks to share technical and organisational experiences in the IT area. Additionally, the Working Party on Security Issues (WPSI) meets twice a year on issues related to IT security.

At the May 2008 GCE meeting, payment systems issues predominated. The main presentation was on the business and technical aspects of the recent round of TARGET2 implementations. At the November meeting, the major topic was the impact of the market turmoil on IT, with discussions highlighting the need to respond very quickly to demand for the development and implementation of new financial instruments and reports.

Infrastructural issues addressed by the WPSI included virtual machine technology, network segmentation and the sharing of IT infrastructures by IT systems and facility management systems. Two-factor authentication, identity management and access control were discussed in relation to secure access to systems and data, mobile computing, portable storage devices, remote access and support by vendors.

Cooperation with regional central bank groupings

Occasional meetings with regional central banking groups allow BIS research, policy analysis and statistics to be disseminated to those central banks that do

[7] In this initiative, the BIS informally represents the views and interests of the central banking community that participates in its statistical initiatives such as the Data Bank and international financial statistics.

not normally participate in the Bank's regular activities. During the past year, these meetings were focused on issues related to the current financial crisis. Activities included:

- seminars on "Financial stability analysis and reports", organised with CEMLA for Latin American and Caribbean central banks and with the Southern African Development Community (SADC) for eastern and southern African central banks;
- a seminar on "Increased capital flows and the implications for central banks", organised with SEACEN for Asia-Pacific central banks; and
- lectures conducted as part of the Masters in Banking and Finance programme of the Centre Africain d'Études Supérieures en Gestion (CESAG), located in Dakar.

The Coordinators of Technical Cooperation and Training held their annual meeting in Basel in July 2008. Thirty-six central banks and international institutions attended the meeting to discuss establishing robust networks and information sharing between those involved in technical cooperation.

Internal Audit

Internal auditors of central banks meet regularly to share experience and knowledge. In June 2008, the 22nd Annual Plenary Conference of G10 Heads of Internal Audit was hosted by the National Bank of Belgium. It covered topics such as changes and trends in internal controls, outsourcing issues, talent management practices in internal audit, audit approaches to analytical areas, and enterprise risk management. In addition, twice a year, the BIS hosts the meetings of the G10 Working Party on IT Audit Methodologies.

BIS Internal Audit has established information sharing networks for internal audit heads from central banks and monetary authorities in the Asia-Pacific region, and in Latin America and the Caribbean. In October 2008, the second meeting of heads of internal audit from central banks in Latin America and the Caribbean was hosted by the Central Bank of Chile in Santiago de Chile. Discussions focused on risk management in financial institutions, internal control failures, and the role of internal audit during stressful periods.

Financial services of the Bank

The scope of financial services

The BIS offers a wide range of financial services designed specifically to assist central banks and other official monetary authorities in the management of their foreign reserves. Some 135 such institutions, as well as a number of international institutions, make active use of these services.

Safety and liquidity are the key features of these credit intermediation services, which are supported by a rigorous internal risk management framework. In accordance with best practice, a separate risk control unit

reporting directly to the Deputy General Manager monitors the Bank's credit, liquidity and market risks. Similarly, a compliance and operational risk unit monitors the Bank's operational risks.

In response to the diverse – and constantly evolving – needs of central banks, the BIS offers an extensive array of investment possibilities in terms of currency denomination, liquidity and maturity. In addition to traditional money market placements such as sight/notice accounts and fixed-term deposits, the Bank offers two instruments that can be traded (bought and sold back): the Fixed-Rate Investment at the BIS (FIXBIS), available in maturities from one week to one year; and the BIS Medium-Term Instrument (MTI), with maturities from one year to 10 years. A series of callable MTI structures, as well as other instruments with embedded optionality, are also part of the standard product range. From time to time, the BIS extends short-term credits to central banks, usually on a collateralised basis. The Bank also acts as trustee and collateral agent (see below).

The Bank transacts foreign exchange and gold on behalf of its customers, providing access to a large liquidity base in the context of, for example, regular rebalancing of reserve portfolios or major changes in reserve currency allocation. The foreign exchange services of the Bank encompass spot transactions in major currencies and Special Drawing Rights (SDR), as well as swaps, outright forwards, options and Dual Currency Deposits (DCDs). In addition, the Bank provides gold services such as sight accounts, fixed-term deposits, earmarked accounts, upgrading and refining, and transport.

The BIS provides asset management services in sovereign securities or high-grade assets. These may take the form of either a specific portfolio mandate negotiated between the BIS and a central bank or an open-end fund structure – the BIS Investment Pool (BISIP) – allowing customers to invest in a common pool of assets. The two Asian Bond Funds (ABF1 and ABF2) are administered by the BIS under the BISIP umbrella: ABF1 is managed by the BIS and ABF2 by a group of external fund managers.

BIS financial services are provided from two linked trading rooms: one at the Bank's head office in Basel and one at its Asian Office in Hong Kong SAR.

Financial operations in 2008/09

Since the summer of 2007, financial markets have been in a constant state of distress. The turmoil confronted the Bank with sustained demand to accept deposits at a time when the conditions induced by the turmoil made it difficult to place funds profitably in the private financial markets at an acceptable level of risk. As a result of actions taken by the BIS in its banking and risk management practices to address these challenges, combined with the evolution of financial market variables, the Bank's currency deposit base decreased by SDR 38.9 billion in 2008/09, after an average annual increase of SDR 25.1 billion in the preceding two years. The currency deposit base stood at SDR 197.2 billion at 31 March 2009.

The total balance sheet decreased by SDR 55.8 billion in 2008/09, after recording growth of SDR 40.2 billion in 2007/08. As a result, the balance sheet total amounted to SDR 255.4 billion at 31 March 2009.

Liabilities

The size of the BIS balance sheet is mainly driven by placements from customers, which constitute the lion's share of total liabilities (see graph). On 31 March 2009, customer placements (excluding repurchase agreements) amounted to SDR 220.3 billion, compared with SDR 265.2 billion at the end of the previous financial year.

Around 90% of customer placements are denominated in currencies, with the remainder in gold. Currency deposits decreased from SDR 236.1 billion a year ago to SDR 197.2 billion at end-March 2009 – representing some 4%[8] of the world's total foreign exchange reserves of nearly SDR 4.5 trillion, up from SDR 4.2 trillion at end-March 2008. The share of currency placements denominated in US dollars was 68%, whereas euro-denominated funds accounted for 21%. Gold deposits amounted to SDR 23.1 billion at end-March 2009, a decrease of SDR 6 billion over the financial year.

The contraction of customer currency placements was mainly attributable to a 13%, 26% and 22% decrease in investments in MTIs, FIXBIS and sight/notice accounts, respectively.

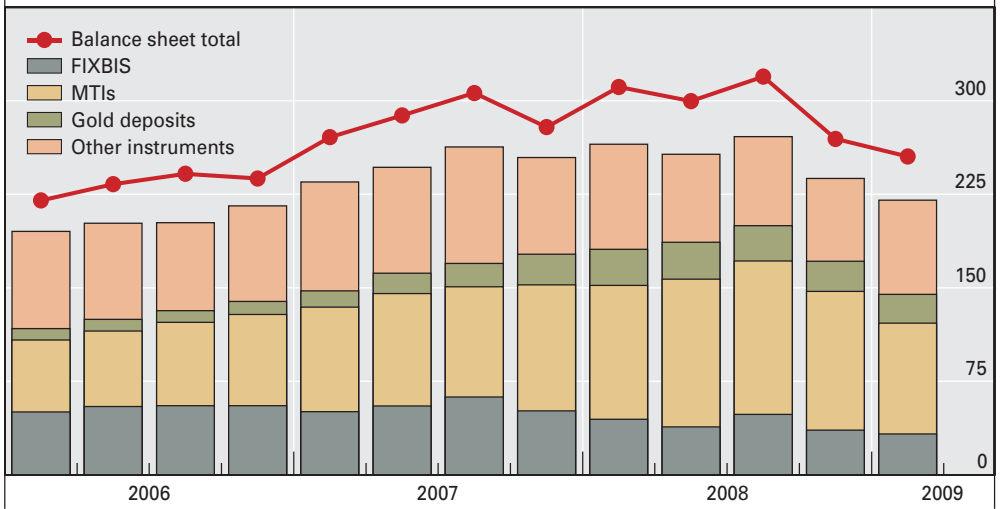
A breakdown of placements with the BIS by geographical region shows a relatively stable pattern, with Asian customers accounting for the highest share.

Assets

Most of the assets held by the BIS consist of government and quasi-government securities, including reverse repurchase agreements and, to a lesser extent than in the previous financial year, investments with highly rated commercial banks of international standing. In addition, the Bank owned 120 tonnes of fine gold at 31 March 2009. The credit exposure is managed in a very prudent manner, with almost all of the Bank's credit exposure rated

Balance sheet total and customer placements by product

End-quarter figures, in billions of SDR



The sum of the bars indicates total customer placements.

[8] Funds placed by institutions for which foreign exchange reserves data are not available are excluded from the calculation.

A– or higher as at 31 March 2009 (see subsection 3, "Credit risk" in the "Risk management" section of the financial statements).

The Bank's holdings of currency assets totalled SDR 208.9 billion on 31 March 2009, down from SDR 265.7 billion at the end of the previous financial year. The decrease in customer placements was mainly accommodated by a reduction of investments with commercial banks, partially offset by an increase in treasury bills.

The Bank uses various derivative instruments to manage its assets and liabilities efficiently (see note 7 to the financial statements).

Agent and trustee functions

Trustee for international government loans

The Bank continued to perform its functions as trustee for the funding bonds 1990–2010 of the Dawes and Young Loans (for details, see the *63rd Annual Report* of June 1993). The Deutsche Bundesbank, as paying agent, notified the Bank that in 2008 the Bundesamt für zentrale Dienste und offene Vermögensfragen (BADV – Federal Office for Central Services and Unresolved Property Issues) had arranged for payment of approximately €4.6 million for redemption of funding bonds and interest. Redemption values and other details were published by the BADV in the *Bundesanzeiger* (*Federal Gazette*).

The Bank maintained its reservations regarding the application by the BADV of the exchange guarantee clause for the Young Loan (stated in detail in its *50th Annual Report* of June 1980), which also extend to the funding bonds 1990–2010.

Collateral agent functions

Under a number of agreements, the BIS acts as collateral agent to hold and invest collateral for the benefit of the holders of certain foreign currency denominated bonds issued by countries under external debt restructuring arrangements. During 2008/09, collateral pledge agreements included those for Peruvian bonds (see the *67th Annual Report* of June 1997) and Côte d'Ivoire bonds (see the *68th Annual Report* of June 1998).

Financial results and profit distribution

Financial results

Background

The Bank's financial results for the 79th financial year, 2008/09, were achieved against a background of the continuing turmoil in the global financial markets in which the BIS operates. This turmoil, which began in July 2007, reached a new level of intensity in September 2008, when a number of important financial institutions failed or were threatened with failure. Banks and other institutions became reluctant to lend to each other except on a very short-term

basis. Credit markets also became severely dislocated, with activity in some areas virtually ceasing as a flight to safety developed.

This deterioration in interbank markets was stemmed by measures taken by central banks and governments in subsequent months to support the global banking system. However, concerns then started to focus beyond the financial sector and towards developments in the global economy, which led in the credit markets to a widening of spreads for non-bank debt issues. Monetary authorities acted to support economic activity by reducing interest rates to exceptionally low levels. In these conditions, the market values of government securities and the price of gold rose markedly.

In these exceptionally turbulent market conditions, the Bank's Management took successive actions to improve the Bank's resilience to events. On the liabilities side of the balance sheet, total currency deposits declined as the interest rates quoted for short-term BIS instruments were lowered and the issuance of certain BIS products was successively reduced and, when necessary, suspended. On the assets side, Management lowered exposures to, and the duration of, placements with commercial banks, while increasing investments in sovereign and quasi-sovereign assets. These actions reduced the balance sheet total and preserved the Bank's underlying profitability, while protecting it from realising significant losses from defaults by counterparties and debt issuers. In addition to these measures, Management restricted disposals of gold during 2008/09 to five tonnes, compared with 25 tonnes sold in the previous financial year, and reduced the duration benchmark for its investment securities portfolios from four years to three.

Highlights

As a result of these developments:

- Interest margins on an accruals basis in the Bank's borrowed funds book widened markedly from their already elevated levels in 2007/08.
- Further unrealised valuation losses were incurred on the bonds in the Bank's credit portfolios in the borrowed funds book as credit spreads widened against Libor.
- Additional realised and unrealised gains on the Bank's own funds investments occurred as the price of gold and the market values of government securities appreciated.

These factors led to:

- an operating profit of SDR 245.3 million, SDR 11.2 million lower than in 2007/08;
- a net profit of SDR 446.1 million, 18.1% lower than in 2007/08;
- a further increase in the Bank's equity (of SDR 612.8 million) following the increase of SDR 1,010.7 million in 2007/08; and
- a 5.8% return on equity in 2008/09, compared to 9.1% in 2007/08.

Detailed review (see profit and loss account)

Net interest income accrued was SDR 1,601.9 million in the financial year 2008/09, 64.5% higher than the equivalent figure of SDR 973.4 million in 2007/08.

This increase was primarily attributable to the higher interest accruals margin arising from the much wider spreads above Libor received on the Bank's risk-weighted assets, as well as the lower interest rates paid on the Bank's liabilities.

Net valuation movements resulted in a loss of SDR 1,181.7 million compared to a loss of SDR 553.7 million in 2007/08.[9] Around SDR 1,100 million of the loss in 2008/09 was attributable to the widening of credit spreads from Libor, which reduced the fair values of the bonds in the Bank's credit portfolios. This unrealised loss amounted to almost 3% of the value of these portfolios (SDR 35 billion), which are invested in top-quality financial instruments.

Operating expense (see note 25 to the financial statements) amounted to SDR 166.5 million, 7.8% above the preceding year's figure (SDR 154.5 million). Administrative expenses before depreciation amounted to SDR 154.4 million, 8.4% above the previous year's figure (SDR 141.9 million). In terms of Swiss francs, the currency in which most of the Bank's administrative expenses are incurred, operating expense rose by 3.2%. The depreciation charge of SDR 12.1 million was SDR 0.5 million below the equivalent figure for 2007/08 (SDR 12.6 million).

After taking into account the above factors, the Bank's operating profit amounted to SDR 245.3 million, 4.4% below the equivalent figure of SDR 256.5 million recorded in 2007/08.

A net gain of SDR 123.8 million was realised on the sale of investment securities during the financial year. This reflected the sale of securities acquired when interest rates were lower and included gains on sales of securities that were realised when the portfolio duration benchmark was reduced as described above. In 2007/08, a net loss of SDR 5.1 million was recorded for the sale of investment securities.

The realised gain of SDR 77.0 million on sales of gold investment assets during 2008/09 arose from the sale of five tonnes from the Bank's total holdings of 125 tonnes at 31 March 2008. In 2007/08, a higher gain (SDR 293.3 million) was recorded on the sale of 25 tonnes of the Bank's own gold.

As a result of these factors, the net profit for the 79th financial year, 2008/09, amounted to SDR 446.1 million, 18.1% lower than the equivalent figure of SDR 544.7 million in the preceding year.

In addition to the items reflected in the Bank's profit and loss account, unrealised gains and losses on the Bank's own gold investments and investment securities are recorded in the gold revaluation account and securities revaluation account, which form part of the Bank's equity.

The securities revaluation account increased by SDR 159.1 million as a result of unrealised gains on investment securities (+SDR 282.8 million), less a transfer to the profit and loss account of realised gains (–SDR 123.8 million) on sales of securities.

[9] Under the Bank's accounting policies, which have been in force since 2003, all financial instruments in its borrowed funds book are valued at fair value. Changes in the fair value of these instruments are taken to the profit and loss account. The Bank acts as market-maker in certain of its currency deposit liabilities, and as a result incurs realised profits and losses on these liabilities. The market risk inherent in these activities is managed on an overall fair value basis, combining all the relevant assets, liabilities and derivatives in the borrowed funds banking portfolios. In normal market conditions, where credit spreads are relatively stable, the realised and unrealised profits or losses on currency deposit liabilities are offset by realised and unrealised losses or profits on the related assets or derivatives, or on other currency deposit liabilities.

The gold revaluation account also increased, by SDR 152.4 million, as a result of unrealised gains (+SDR 229.4 million) resulting from the impact of the appreciating gold price in 2008/09 on the Bank's own gold holdings, less a transfer to the profit and loss account of realised gains (–SDR 77.0 million) on the sale of five tonnes of gold referred to above.

After taking these gains into account, the Bank's total return for 2008/09 was SDR 757.6 million. This represented a return of 5.8% on average equity (SDR 13,149 million). In 2007/08, the total return had been SDR 1,150.0 million, and the return on average equity (SDR 12,586 million) had been 9.1%. Taking into account the payment of the dividend for 2007/08, the Bank's equity increased by SDR 612.8 million during the year ended 31 March 2009. This compares with an equivalent increase of SDR 1,010.7 million in 2007/08.

Proposed dividend

The Board reviewed the dividend policy of the BIS during the financial year 2005/06. The review took into consideration the Bank's capital needs and the interests of BIS shareholders in obtaining a fair and sustainable return on their investments in BIS shares. The Board concluded that the approach of increasing the dividend by SDR 10 each year continued to be broadly consistent with these considerations. This approach resulted in an increase in the dividend from SDR 235 per share in 2004/05 to SDR 265 in 2007/08. The Board also decided to review the dividend policy every two to three years, taking into account changing circumstances where necessary.

As foreseen last year, the Board reviewed the level of the dividend once again during 2008/09 and concluded that the prevailing market turbulence and resulting uncertainties did not provide an appropriate environment to develop a medium-term dividend policy. Taking into account the financial developments described above, the Board proposes that the dividend for 2008/09 be unchanged from the previous financial year at SDR 265 per share.

Proposed distribution of the net profit for the year

On the basis of Article 51 of the Statutes, the Board of Directors recommends to the Annual General Meeting that the net profit of SDR 446.1 million for the financial year 2008/09 be applied by the General Meeting in the following manner:

1. SDR 144.7 million in payment of a dividend of SDR 265 per share;
2. SDR 30.1 million to be transferred to the general reserve fund;[10]
3. SDR 271.3 million, representing the remainder of the available net profit, to be transferred to the free reserve fund. This fund can be used by the Board of Directors for any purpose that is in conformity with the Statutes.

No transfer to the special dividend reserve fund is proposed for 2008/09 as the recommended dividend is unchanged from the dividend for the previous financial year.

[10] Since the general reserve fund exceeded four times the Bank's paid-up capital at 31 March 2009, Article 51 of the Bank's Statutes requires that 10% of the profit after payment of the dividend shall be paid into this fund, until its balance equals five times the paid-up capital.

If approved, the dividend will be paid on 2 July 2009 according to each shareholder's instructions in any constituent currency of the SDR, or in Swiss francs, to the shareholders named in the Bank's share register on 31 March 2009.

The full dividend will be paid on 546,125 shares. The number of issued and paid-up shares is 547,125. Of these shares, 1,000 were held in treasury at 31 March 2009, namely the suspended shares of the Albanian issue. No dividend will be paid on these treasury shares.

Report of the auditors

The Bank's financial statements have been duly audited by Deloitte AG, who have confirmed that the statements give a true and fair view of the Bank's financial position at 31 March 2009 and the results of its operations for the year then ended. Their report is to be found immediately following the financial statements.

Financial statements

as at 31 March 2009

The financial statements on pages 182–239 for the financial year ended 31 March 2009 were approved on 11 May 2009 for presentation to the Annual General Meeting on 29 June 2009. They are presented in a form approved by the Board of Directors pursuant to Article 49 of the Bank's Statutes and are subject to approval by the shareholders at the Annual General Meeting.

Jaime Caruana
General Manager

Hervé Hannoun
Deputy General Manager

Balance sheet

As at 31 March 2009

SDR millions	Notes	**2009**	2008
Assets			
Cash and sight accounts with banks	3	915.2	36.8
Gold and gold loans	4	25,416.2	31,537.7
Treasury bills	5	96,421.9	50,736.9
Securities purchased under resale agreements	5	38,594.4	91,884.6
Loans and advances	6	18,512.7	62,095.9
Government and other securities	5	55,763.7	61,918.5
Derivative financial instruments	7	13,749.1	7,426.4
Accounts receivable	8	5,822.5	5,311.8
Land, buildings and equipment	9	191.0	190.4
Total assets		**255,386.7**	311,139.0
Liabilities			
Currency deposits	10	197,222.2	236,120.9
Gold deposits	11	23,052.1	29,101.4
Securities sold under repurchase agreements	12	–	1,894.1
Derivative financial instruments	7	6,816.8	6,227.7
Accounts payable	13	14,211.5	24,365.4
Other liabilities	14	368.2	326.5
Total liabilities		**241,670.8**	298,036.0
Shareholders' equity			
Share capital	15	683.9	683.9
Statutory reserves	16	10,367.3	9,967.3
Profit and loss account		446.1	544.7
Less: shares held in treasury	17	(1.7)	(1.7)
Other equity accounts	18	2,220.3	1,908.8
Total equity		**13,715.9**	13,103.0
Total liabilities and equity		**255,386.7**	311,139.0

Profit and loss account

For the financial year ended 31 March 2009

SDR millions	Notes	**2009**	2008
Interest income	20	8,254.9	11,181.2
Interest expense	21	(6,653.0)	(10,207.8)
Net interest income		**1,601.9**	973.4
Net valuation movement	22	(1,181.7)	(553.7)
Net interest and valuation income		**420.2**	419.7
Net fee and commission income	23	0.4	0.8
Net foreign exchange loss	24	(8.8)	(9.5)
Total operating income		**411.8**	411.0
Operating expense	25	(166.5)	(154.5)
Operating profit		**245.3**	256.5
Net gain / (loss) on sales of securities available for sale	26	123.8	(5.1)
Net gain on sales of gold investment assets	27	77.0	293.3
Net profit for the financial year		**446.1**	544.7
Basic and diluted earnings per share (in SDR per share)	28	**816.8**	997.4

Statement of cash flows

For the financial year ended 31 March 2009

SDR millions	Notes	**2009**	2008
Cash flow from / (used in) operating activities			
Interest and similar income received		6,710.8	11,665.4
Interest and similar expenses paid		(4,802.1)	(10,118.3)
Net fee and commission income		0.4	0.8
Foreign exchange transaction income		11.6	4.5
Operating expenses paid		(154.4)	(141.9)
Non-cash flow items included in operating profit			
Valuation movements on operating assets and liabilities		(1,181.7)	(553.7)
Foreign exchange translation loss		(20.4)	(14.0)
Impairment charge on gold assets		(18.3)	–
Change in accruals and amortisation		(288.4)	(573.7)
Change in operating assets and liabilities			
Currency deposit liabilities held at fair value through profit and loss		(29,289.7)	(1,445.5)
Currency banking assets		44,724.0	(13,174.8)
Sight and notice deposit account liabilities		(8,910.2)	15,966.5
Gold deposits		(6,049.3)	15,842.8
Gold and gold loan banking assets		6,055.2	(15,961.7)
Accounts receivable		(0.3)	13.4
Other liabilities / accounts payable		41.8	(46.9)
Net derivative financial instruments		(5,733.6)	(2,190.9)
Net cash flow used in operating activities		**1,095.4**	(728.0)
Cash flow from / (used in) investment activities			
Net change in currency investment assets available for sale	5B	1,021.2	(1,479.4)
Net change in currency investment assets held at fair value through profit and loss		15.0	(9.3)
Net change in securities sold under repurchase agreements		(1,894.1)	831.6
Net change in gold investment assets	4B	295.7	245.0
Net purchase of land, buildings and equipment	9	(12.7)	(15.0)
Net cash flow used in investment activities		**(574.9)**	(427.1)

SDR millions	Notes	**2009**	2008
Cash flow used in financing activities			
Dividends paid		(144.7)	(139.3)
Shares repurchased in 2001 – payments to former shareholders		(0.1)	(0.5)
Net cash flow used in financing activities		**(144.8)**	(139.8)
Total net cash flow		**375.7**	(1,294.9)
Net effect of exchange rate changes on cash and cash equivalents		(23.2)	101.0
Net movement in cash and cash equivalents		398.9	(1,395.9)
Net change in cash and cash equivalents		**375.7**	(1,294.9)
Cash and cash equivalents, beginning of year	29	**936.1**	2,231.0
Cash and cash equivalents, end of year	29	**1,311.8**	936.1

Movements in the Bank's equity

For the financial year ended 31 March 2009

SDR millions	Notes	Share capital	Statutory reserves	Profit and loss	Shares held in treasury	Other equity accounts	Total equity
Equity at 31 March 2007		**683.9**	**9,487.4**	**619.2**	**(1.7)**	**1,303.5**	**12,092.3**
Income:							
Net profit for 2007/08		–	–	544.7	–	–	544.7
Net valuation movement on securities available for sale	18A	–	–	–	–	352.5	352.5
Net valuation movement on gold investment assets	18B	–	–	–	–	252.8	252.8
Total recognised income		**–**	**–**	**544.7**	**–**	**605.3**	**1,150.0**
Payment of 2006/07 dividend		–	–	(139.3)	–	–	(139.3)
Allocation of 2006/07 profit		–	479.9	(479.9)	–	–	–
Equity at 31 March 2008		**683.9**	**9,967.3**	**544.7**	**(1.7)**	**1,908.8**	**13,103.0**
Income:							
Net profit for 2008/09		–	–	446.1	–	–	446.1
Net valuation movement on securities available for sale	18A	–	–	–	–	159.1	159.1
Net valuation movement on gold investment assets	18B	–	–	–	–	152.4	152.4
Total recognised income		**–**	**–**	**446.1**	**–**	**311.5**	**757.6**
Payment of 2007/08 dividend		–	–	(144.7)	–	–	(144.7)
Allocation of 2007/08 profit		–	400.0	(400.0)	–	–	–
Equity at 31 March 2009 per balance sheet before proposed profit allocation		**683.9**	**10,367.3**	**446.1**	**(1.7)**	**2,220.3**	**13,715.9**
Proposed dividend		–	–	(144.7)	–	–	(144.7)
Proposed transfers to reserves		–	301.4	(301.4)	–	–	–
Equity at 31 March 2009 after proposed profit allocation		**683.9**	**10,668.7**	**–**	**(1.7)**	**2,220.3**	**13,571.2**

At 31 March 2009 statutory reserves included share premiums of SDR 811.7 million (2008: SDR 811.7 million).

Statement of proposed profit allocation

For the financial year ended 31 March 2009

SDR millions	Notes	2009
Net profit for the financial year		**446.1**
Transfer to legal reserve fund	16	–
Proposed dividend:		
SDR 265 per share on 546,125 shares		(144.7)
Proposed transfers to reserves:		
General reserve fund	16	(30.1)
Special dividend reserve fund	16	–
Free reserve fund	16	(271.3)
Balance after allocation to reserves		**–**

The proposed profit allocation is in accordance with Article 51 of the Bank's Statutes.

Movements in the Bank's statutory reserves

For the financial year ended 31 March 2009

						2009
SDR millions	Notes	Legal reserve fund	General reserve fund	Special dividend reserve fund	Free reserve fund	Total statutory reserves
Balance at 31 March 2008		**68.3**	**3,009.8**	**148.0**	**6,741.2**	**9,967.3**
Allocation of 2007/08 profit	16	–	40.0	6.0	354.0	400.0
Balance at 31 March 2009 per balance sheet before proposed profit allocation		**68.3**	**3,049.8**	**154.0**	**7,095.2**	**10,367.3**
Proposed transfers to reserves	16	–	30.1	–	271.3	301.4
Balance at 31 March 2009 after proposed profit allocation		**68.3**	**3,079.9**	**154.0**	**7,366.5**	**10,668.7**

Accounting policies

The accounting policies set out below have been applied to both of the financial years presented unless otherwise stated.

1. Scope of the financial statements

These financial statements contain all assets and liabilities that are controlled by the Bank and in respect of which the economic benefits as well as the rights and obligations lie with the Bank.

Assets and liabilities in the name of but not controlled by the Bank and in respect of which the economic benefits as well as the rights and obligations do not lie with the Bank are not included in these financial statements. Information on off-balance sheet assets and liabilities is disclosed in note 32.

2. Functional and presentation currency

The functional and presentation currency of the Bank is the Special Drawing Right (SDR) as defined by the International Monetary Fund (IMF).

The SDR is calculated from a basket of major trading currencies according to Rule O–1 as adopted by the Executive Board of the IMF on 30 December 2005 and effective 1 January 2006. As currently calculated, one SDR is equivalent to the sum of USD 0.632, EUR 0.410, JPY 18.4 and GBP 0.0903. The composition of this currency basket is subject to review every five years by the IMF; the next review is due to be undertaken in December 2010.

All figures in these financial statements are presented in SDR millions unless otherwise stated.

3. Currency translation

Monetary assets and liabilities are translated into SDR at the exchange rates ruling at the balance sheet date. Other assets and liabilities are recorded in SDR at the exchange rates ruling at the date of the transaction. Profits and losses are translated into SDR at an average rate. Exchange differences arising from the retranslation of monetary assets and liabilities and from the settlement of transactions are included as net foreign exchange gains or losses in the profit and loss account.

4. Designation of financial instruments

Upon initial recognition the Bank allocates each financial instrument to one of the following categories:

- Loans and receivables
- Financial assets and financial liabilities held at fair value through profit and loss
- Available for sale financial assets
- Financial liabilities measured at amortised cost

The allocation to these categories is dependent on the nature of the financial instrument and the purpose for which it was entered into, as described in Section 5 below.

The resulting designation of each financial instrument determines the accounting methodology that is applied, as described in the accounting policies below. Where the financial instrument is designated as held at fair value through profit and loss, the Bank does not subsequently change this designation.

5. Asset and liability structure

Assets and liabilities are organised into two sets of portfolios:

A. Banking portfolios

These comprise currency and gold deposit liabilities and related banking assets and derivatives.

The Bank operates a banking business in currency and gold on behalf of its customers. In this business the Bank takes limited gold price, interest rate and foreign currency risk.

The Bank designates all currency financial instruments in its banking portfolios (other than cash and sight and notice accounts with banks, and sight and notice deposit account liabilities) as held at fair value through profit and loss. The use of fair values in the currency banking portfolios is described in Section 9 below.

All gold financial assets in these portfolios are designated as loans and receivables and all gold financial liabilities are designated as financial liabilities measured at amortised cost.

B. Investment portfolios

These comprise assets, liabilities and derivatives relating principally to the investment of the Bank's equity.

The Bank holds most of its equity in financial instruments denominated in the constituent currencies of the SDR, which are managed using a fixed duration benchmark of bonds.

The relevant currency assets (other than cash and sight and notice accounts with banks) are designated as available for sale. Related securities sold under repurchase agreements are designated as financial liabilities measured at amortised cost.

In addition, the Bank maintains some of its equity in more actively managed portfolios. The currency assets in these portfolios are trading assets and as such are designated as held at fair value through profit and loss.

The remainder of the Bank's equity is held in gold. The Bank's own gold holdings are designated as available for sale.

6. Cash and sight accounts with banks

Cash and sight accounts with banks are included in the balance sheet at their principal value plus accrued interest where applicable.

7. Notice accounts

Notice accounts are short-term monetary assets. They typically have notice periods of three days or less and are included under the balance sheet heading "Loans and advances".

Due to their short-term nature, these financial instruments are designated as loans and receivables. They are included in the balance sheet at their principal value plus accrued interest. Interest is included in interest income on an accruals basis.

8. Sight and notice deposit account liabilities

Sight and notice deposit accounts are short-term monetary liabilities. They typically have notice periods of three days or less and are included under the balance sheet heading "Currency deposits".

Due to their short-term nature, these financial instruments are designated as financial liabilities measured at amortised cost. They are included in the balance sheet at their principal value plus accrued interest. Interest is included in interest expense on an accruals basis.

9. Use of fair values in the currency banking portfolios

In operating its currency banking business, the Bank acts as a market-maker in certain of its currency deposit liabilities. As a result of this activity the Bank incurs realised profits and losses on these liabilities.

In accordance with the Bank's risk management policies the market risk inherent in this activity is managed on an overall fair value basis, combining all the relevant assets, liabilities and derivatives in its currency banking portfolios. The realised and unrealised profits or losses on currency deposit liabilities are thus largely offset by realised and unrealised losses or profits on the related currency assets and derivatives, or on other currency deposit liabilities.

To reduce the accounting inconsistency that would arise from recognising realised and unrealised gains and losses on different bases, the Bank designates the relevant assets, liabilities and derivatives in its currency banking portfolios as held at fair value through profit and loss.

10. Currency deposit liabilities held at fair value through profit and loss

As described above, all currency deposit liabilities, with the exception of sight and notice deposit account liabilities, are designated as held at fair value through profit and loss.

These currency deposit liabilities are initially included in the balance sheet on a trade date basis at cost. The subsequent accrual of interest to be paid and amortisation of premiums received and discounts paid are included in "Interest expense" on an effective interest rate basis.

After trade date, the currency deposit liabilities are revalued to fair value, with all realised and unrealised movements in fair value included under the profit and loss account heading "Net valuation movement".

11. Currency assets held at fair value through profit and loss

Currency assets include treasury bills, securities purchased under resale agreements, loans and advances, and government and other securities.

As described above, the Bank designates all of the relevant assets in its currency banking portfolios as held at fair value through profit and loss. In addition, the Bank maintains certain actively managed investment portfolios. The currency assets in these portfolios are trading assets and as such are designated as held at fair value through profit and loss.

These currency assets are initially included in the balance sheet on a trade date basis at cost. The subsequent accrual of interest and amortisation of premiums paid and discounts received are included in "Interest income" on an effective interest rate basis.

After trade date, the currency assets are revalued to fair value, with all realised and unrealised movements in fair value included under the profit and loss account heading "Net valuation movement".

12. Currency assets available for sale

Currency assets include treasury bills, securities purchased under resale agreements, loans and advances, and government and other securities.

As described above, the Bank designates as available for sale all of the relevant assets in its currency investment portfolios, except for those assets in the Bank's more actively managed investment portfolios.

These currency assets are initially included in the balance sheet on a trade date basis at cost. The subsequent accrual of interest and amortisation of premiums paid and discounts received are included in "Interest income" on an effective interest rate basis.

After trade date, the currency assets are revalued to fair value, with unrealised gains or losses included in the securities revaluation account, which is reported under the balance sheet heading "Other equity accounts". Realised profits on disposal are included under the profit and loss heading "Net gain / (loss) on sales of securities available for sale".

13. Short positions in currency assets

Short positions in currency assets are included in the balance sheet under the heading "Other liabilities" at market value on a trade date basis.

14. Gold

Gold comprises gold bars held in custody and sight accounts. Gold is considered by the Bank to be a financial instrument.

Gold is included in the balance sheet at its weight in gold (translated at the gold market price and USD exchange rate into SDR). Purchases and sales of gold are accounted for on a settlement date basis. Forward purchases or sales of gold are treated as derivatives prior to the settlement date.

The treatment of realised and unrealised gains or losses on gold is described in Section 17 below.

15. Gold loans

Gold loans comprise fixed-term gold loans to commercial banks. Gold is considered by the Bank to be a financial instrument.

Gold loans are included in the balance sheet on a trade date basis at their weight in gold (translated at the gold market price and USD exchange rate into SDR) plus accrued interest.

Interest on gold loans is included in interest income on an effective interest rate basis. The treatment of realised and unrealised gains or losses on gold is described in Section 17 below.

16. Gold deposits

Gold deposits comprise sight and fixed-term deposits of gold from central banks. Gold is considered by the Bank to be a financial instrument.

Gold deposits are included in the balance sheet on a trade date basis at their weight in gold (translated at the gold market price and USD exchange rate into SDR) plus accrued interest.

Interest on gold deposits is included in interest expense on an effective interest rate basis. The treatment of realised and unrealised gains or losses on gold is described in Section 17 below.

17. Realised and unrealised gains or losses on gold

The treatment of realised and unrealised gains or losses on gold depends on the designation as described below:

A. Banking portfolios, comprising gold deposits and related gold banking assets

The Bank designates gold loans in its banking portfolios as loans and receivables and gold deposits as financial liabilities measured at amortised cost. The gold derivatives included in the portfolios are designated as held at fair value through profit and loss.

Gains or losses on these transactions in gold are included under the profit and loss account heading "Net foreign exchange gain / (loss)" as net transaction gains or losses.

Gains or losses on the retranslation of the net position in gold in the banking portfolios are included under the profit and loss account heading "Net foreign exchange gain / (loss)" as net translation gains or losses.

B. Investment portfolios, comprising gold investment assets

The Bank's own holdings of gold are designated and accounted for as available for sale assets.

Unrealised gains or losses on the Bank's gold investment assets over their deemed cost are taken to the gold revaluation account in equity, which is reported under the balance sheet heading "Other equity accounts".

For gold investment assets held on 31 March 2003 (when the Bank changed its functional and presentation currency from the gold franc to the SDR) the deemed cost is approximately SDR 151 per ounce, based on the value of USD 208 that was applied from 1979 to 2003 following a decision by the Bank's Board of Directors, translated at the 31 March 2003 exchange rate.

Realised gains or losses on disposal of gold investment assets are included in the profit and loss account as "Net gain on sales of gold investment assets".

18. Securities sold under repurchase agreements

Where these liabilities are associated with the management of currency assets held at fair value through profit and loss, they are designated as financial instruments held at fair value through profit and loss. Where these liabilities are associated with currency assets available for sale, they are designated as financial liabilities measured at amortised cost.

They are initially included in the balance sheet on a trade date basis at cost. The subsequent accrual of interest is included in "Interest expense" on an effective interest rate basis.

After trade date, those liabilities that are designated as held at fair value through profit and loss are revalued to fair value, with unrealised gains or losses included under the profit and loss account heading "Net valuation movement".

19. Derivatives

Derivatives are used either to manage the Bank's market risk or for trading purposes. They are designated as financial instruments held at fair value through profit and loss.

They are initially included in the balance sheet on a trade date basis at cost. The subsequent accrual of interest and amortisation of premiums paid and discounts received are included in "Interest income" on an effective interest rate basis.

After trade date, derivatives are revalued to fair value, with all realised and unrealised movements in value included under the profit and loss account heading "Net valuation movement".

Derivatives are included as either assets or liabilities, depending on whether the contract has a positive or a negative fair value for the Bank.

Where a derivative contract is embedded within a host contract which is not accounted for as held at fair value through profit and loss, it is separated from the host contract for accounting purposes and treated as though it were a standalone derivative as described above.

20. Valuation policy

The Bank's valuation policy has been approved by the Board of Directors. In this policy the Bank defines how financial instruments are designated, which determines their valuation basis and accounting treatment. This policy is supplemented with detailed valuation procedures.

The majority of the financial instruments on the balance sheet are included at fair value. The Bank defines the fair value of a financial instrument as the amount at which the instrument could be exchanged between knowledgeable, willing parties in an arm's length transaction.

The use of fair values ensures that the financial reporting to the Board and shareholders reflects the way in which the banking business is managed and is consistent with the risk management economic performance figures reported to Management.

The Bank considers published price quotations in active markets as the best evidence of fair value. Where no published price quotations exist, the Bank determines fair values using a valuation technique appropriate to the particular financial instrument. Such valuation techniques may involve using market prices of recent arm's length market transactions in similar instruments or may make use of financial models. Where financial models are used, the Bank aims at making maximum use of observable market inputs (eg interest rates and volatilities) as appropriate, and relies as little as possible on own estimates. Such valuation models comprise discounted cash flow analyses and option pricing models.

Where valuation techniques are used to determine fair values, the valuation models are subject to initial approval and periodic review in line with the requirements of the Bank's model validation policy.

The Bank has an independent valuation control function which periodically reviews financial instrument valuations. Other valuation controls include the review and analysis of daily profit and loss.

The Bank values its assets at the bid price and its liabilities at the offer price. Financial assets and liabilities that are not valued at fair value are included in the balance sheet at amortised cost.

21. Impairment of financial assets

Financial assets, other than those designated as held at fair value through profit and loss, are assessed for indications of impairment at each balance sheet date. Financial assets are impaired when there is objective evidence that the estimated future cash flows of the asset have been reduced as a result of one or more events that occurred after the initial recognition of the asset. Evidence of impairment could include significant financial difficulty, default, or probable bankruptcy / financial reorganisation of the counterparty or issuer.

Impairment losses are recognised in the profit and loss account if a decline in fair value below amortised cost is considered other than temporary. If the amount of the impairment loss decreases in a subsequent period, the previously recognised impairment loss is reversed through profit and loss to the extent that the carrying amount of the investment does not exceed that which it would have been had the impairment not been recognised.

22. Accounts receivable and accounts payable

Accounts receivable and accounts payable are principally very short-term amounts relating to the settlement of financial transactions. They are initially recognised at fair value and subsequently included in the balance sheet at amortised cost.

23. Land, buildings and equipment

The cost of the Bank's buildings and equipment is capitalised and depreciated on a straight line basis over the estimated useful lives of the assets concerned, as follows:

- Buildings – 50 years
- Building installations and machinery – 15 years
- Information technology equipment – up to 4 years
- Other equipment – 4 to 10 years

The Bank's land is not depreciated. The Bank undertakes an annual review of impairment of land, buildings and equipment. Where the carrying amount of an asset is greater than its estimated recoverable amount, it is written down to that amount.

24. Provisions

Provisions are recognised when the Bank has a present legal or constructive obligation as a result of events arising before the balance sheet date and it is probable that economic resources will be required to settle the obligation, provided that a reliable estimate can be made of the amount of the obligation. Best estimates and assumptions are used when determining the amount to be recognised as a provision.

25. Post-employment benefit obligations

The Bank operates three post-employment benefit arrangements for staff pensions, Directors' pensions and health and accident insurance for current and former staff members. An independent actuarial valuation is performed annually for each arrangement.

A. Staff pensions

The Bank provides a final salary defined benefit pension arrangement for its staff, based on a fund without separate legal personality, out of which benefits are paid. The fund assets are administered by the Bank for the sole benefit of current and former members of staff who participate in the arrangement. The Bank remains ultimately liable for all benefits due under the arrangement.

The liability in respect of the staff pension fund is based on the present value of the defined benefit obligation at the balance sheet date, less the fair value of the fund assets at the balance sheet date, together with adjustments for unrecognised actuarial gains and losses and past service costs. The defined benefit obligation is calculated using the projected unit credit method. The present value of the defined benefit obligation is determined from the estimated future cash outflows. The rate used to discount the cash flows is determined by the Bank based on the market yield of highly rated corporate debt securities in Swiss francs which have terms to maturity approximating the terms of the related liability.

The amount charged to the profit and loss account represents the sum of the current service cost of the benefits accruing for the year under the scheme, and interest at the discount rate on the defined benefit obligation. In addition, actuarial gains and losses arising from experience adjustments (where the actual outcome is different from the actuarial assumptions previously made), changes in actuarial assumptions and amendments to the pension fund regulations are charged to the profit and loss account over the service period of staff concerned in accordance with the "Corridor accounting" methodology described below. The resulting liabilities are included under the heading "Other liabilities" in the balance sheet.

B. Directors' pensions

The Bank provides an unfunded defined benefit arrangement for Directors' pensions. The liability, defined benefit obligation and amount charged to the profit and loss account in respect of the Directors' pension arrangement are calculated on a similar basis to that used for the staff pension fund.

C. Post-employment health and accident benefits

The Bank provides an unfunded post-employment health and accident benefit arrangement for its staff. The liability, benefit obligation and amount charged to the profit and loss account in respect of the health and accident benefit arrangement are calculated on a similar basis to that used for the staff pension fund.

D. Corridor accounting

Actuarial gains or losses arise from experience adjustments (where the actual outcome is different from the actuarial assumptions previously made), changes in actuarial assumptions and amendments to the pension fund regulations. Where the cumulative unrecognised actuarial gains or losses exceed the higher of the benefit obligation or any assets used to fund the obligation by more than a corridor of 10%, the resulting excess outside the corridor is amortised over the expected remaining service period of the staff concerned.

26. Cash flow statement

The Bank's cash flow statement is prepared using an indirect method. It is based on the movements in the Bank's balance sheet, adjusted for changes in financial transactions awaiting settlement.

Cash and cash equivalents consist of cash and sight accounts with banks, and call and notice accounts, which are very short-term financial assets that typically have notice periods of three days or less.

Notes to the financial statements

1. Introduction

The Bank for International Settlements (BIS, "the Bank") is an international financial institution which was established pursuant to the Hague Agreements of 20 January 1930, the Bank's Constituent Charter and its Statutes. The headquarters of the Bank are at Centralbahnplatz 2, 4002 Basel, Switzerland. The Bank maintains representative offices in Hong Kong, Special Administrative Region of the People's Republic of China (for Asia and the Pacific) and in Mexico City, Mexico (for the Americas).

The objectives of the BIS, as laid down in Article 3 of its Statutes, are to promote cooperation among central banks, to provide additional facilities for international financial operations and to act as trustee or agent for international financial settlements. Fifty-five central banks are currently members of the Bank. Rights of representation and voting at General Meetings are exercised in proportion to the number of BIS shares issued in the respective countries. The Board of Directors of the Bank is composed of the Governors and appointed Directors from the Bank's founder central banks, being those of Belgium, France, Germany, Italy, the United Kingdom and the United States of America, as well as the Governors of the central banks of Canada, China, Japan, Mexico, the Netherlands, Sweden and Switzerland, and the President of the European Central Bank.

2. Use of estimates

The preparation of the financial statements requires the Bank's Management to make some estimates in arriving at the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of income and expenses during the financial year. To arrive at these estimates, Management uses available information, exercises judgment and makes assumptions.

Judgment is exercised when selecting and applying the Bank's accounting policies. The judgments relating to the designation and valuation of financial instruments are key elements in the preparation of these financial statements.

Assumptions include forward-looking estimates, for example relating to the valuation of assets and liabilities, the assessment of post-employment benefit obligations and the assessment of provisions and contingent liabilities.

Subsequent actual results could differ materially from those estimates.

A. The valuation of financial assets and liabilities

There is no active secondary market for certain of the Bank's financial assets and financial liabilities. Such assets and liabilities are valued using valuation techniques which require judgment to determine appropriate valuation parameters. Changes in assumptions about these parameters could materially affect the reported fair values. The valuation impact of a 1 basis point change in spread assumptions is shown in the table below:

For the financial year ended 31 March

SDR millions	**2009**	2008
Securities purchased under resale agreements	0.1	0.5
Loans and advances	0.2	1.0
Government and other securities	9.5	9.4
Currency deposits	18.5	24.0
Derivative financial instruments	8.9	16.0

B. The valuation of corporate bonds

In the financial market environment at 31 March 2009 the degree of judgment involved in valuing financial instruments has increased significantly from previous years. With few actual market trades in certain financial assets held by the Bank, a high degree of judgment has been necessary to select valuation parameters from within a wide range of potential alternative assumptions. This is particularly relevant for the Bank's holdings of corporate bonds (included under the balance sheet heading "Government and other securities"), for which the potential range of alternative spread assumptions was of the order of tens of basis points. Management believes that all of the valuation parameters used by the Bank reflect market conditions at the balance sheet date in a fair and prudent manner.

C. Impairment charge on financial assets

Gold loans include a charge of SDR 18.3 million following an impairment review as at 31 March 2009 (31 March 2008: nil). The impairment review was conducted at an individual counterparty level, identifying those counterparties which were experiencing significant financial difficulties at the balance sheet date. The impairment charge is included in the profit and loss account under the heading "Net interest income".

D. Actuarial assumptions and medical cost inflation

The valuation of the Bank's pension fund and health care arrangements relies on actuarial assumptions and expectations of inflation and interest rates. Changes to these assumptions will have an impact on the valuation of the Bank's pension fund liabilities and the amounts recognised in the financial statements.

3. Cash and sight accounts with banks

Cash and sight accounts with banks consist of cash balances with central banks and commercial banks that are available to the Bank on demand.

4. Gold and gold loans

A. Total gold holdings

The composition of the Bank's total gold holdings was as follows:

As at 31 March

SDR millions	**2009**	2008
Gold bars held at central banks	22,616.5	27,530.9
Total gold loans	2,799.7	4,006.8
Total gold and gold loan assets	**25,416.2**	31,537.7
Comprising:		
Gold investment assets	2,358.1	2,424.4
Gold and gold loan banking assets	23,058.1	29,113.3

Due to the deterioration in creditworthiness of borrowers, an impairment charge of SDR 18.3 million (2008: nil) was recognised in the year. The impairment charge is included under the profit and loss account heading "Net interest income".

B. Gold investment assets

The Bank's gold investment assets are included in the balance sheet at their weight in gold (translated at the gold market price and USD exchange rate into SDR) plus accrued interest. The excess of this value over the deemed cost value is included in the gold revaluation account (reported under the balance sheet heading "Other equity accounts"), and realised gains or losses on the disposal of gold investment assets are recognised in the profit and loss account.

Note 18 provides further analysis of the gold revaluation account. Note 27 provides further analysis of the net gain on sales of gold investment assets.

The table below analyses the movements in the Bank's gold investment assets:

For the financial year ended 31 March

SDR millions	**2009**	2008
Balance at beginning of year	2,424.4	2,306.0
Net change in gold investment assets		
Loans placed	–	–
Disposals of gold	(102.0)	(414.3)
Maturities, impairment, sight account and other net movements	(193.7)	169.3
	(295.7)	(245.0)
Net change in transactions awaiting settlement	–	(182.7)
Gold price movement	229.4	546.1
Balance at end of year	**2,358.1**	2,424.4

At 1 April 2008 the Bank's gold investment assets amounted to 125 tonnes of fine gold. During the financial year ended 31 March 2009 5 tonnes of fine gold (2008: 25 tonnes) were disposed of (see note 27). The balance at 31 March 2009 amounted to 120 tonnes of fine gold.

5. Currency assets

A. Total holdings

Currency assets comprise treasury bills, securities purchased under resale agreements, fixed-term loans, and government and other securities.

Currency assets held at fair value through profit and loss comprise those currency banking assets that represent the reinvestment of customer deposits and those currency investment assets that are part of more actively managed portfolios. Currency assets available for sale comprise the remainder of the Bank's currency investment assets and represent, for the most part, the investment of the Bank's equity.

Treasury bills are short-term debt securities issued by governments on a discount basis.

Securities purchased under resale agreements ("reverse repurchase agreements") are transactions under which the Bank makes a fixed-term loan to a counterparty which provides collateral in the form of securities. The rate on the loan is fixed at the beginning of the transaction, and there is an irrevocable commitment to return the equivalent securities subject to the repayment of the loan. During the term of the agreement the fair value of collateral is monitored, and additional collateral is obtained where appropriate to protect against credit exposure.

Fixed-term loans are primarily investments made with commercial banks. Also included in this category are investments made with central banks, international institutions and other public sector organisations. This includes advances made as part of committed and uncommitted standby facilities. The balance sheet total "Loans and advances" also includes notice accounts (see note 6).

Government and other securities are debt securities issued by governments, international institutions, other public institutions, commercial banks and corporates. They include fixed and floating rate bonds and asset-backed securities.

The tables below analyse the Bank's holdings of currency assets:

As at 31 March 2009	Banking assets	Investment assets			**Total currency assets**
SDR millions	Held at fair value through profit and loss	Available for sale	Held at fair value through profit and loss	Total	
Treasury bills	**96,399.2**	**–**	**22.7**	**22.7**	**96,421.9**
Securities purchased under resale agreements	**38,594.4**	**–**	**–**	**–**	**38,594.4**
Fixed-term loans and advances	**18,116.1**	**–**	**–**	**–**	**18,116.1**
Government and other securities					
Government	3,024.1	8,211.8	–	8,211.8	11,235.9
Financial institutions	22,548.1	707.6	710.7	1,418.3	23,966.4
Other (including public sector securities)	18,621.5	1,939.9	–	1,939.9	20,561.4
	44,193.7	**10,859.3**	**710.7**	**11,570.0**	**55,763.7**
Total currency assets	**197,303.4**	**10,859.3**	**733.4**	**11,592.7**	**208,896.1**

There is no active secondary market for the Bank's securities purchased under resale agreements, fixed-term loans and for certain government and other securities. These assets are valued using valuation techniques which require judgment to determine appropriate valuation parameters. A 1 basis point change in spread assumptions for the three categories of financial instruments would have had an impact on the valuation of SDR 9.8 million (2008: SDR 10.9 million).

As at 31 March 2008	Banking assets	Investment assets			Total currency assets
SDR millions	Held at fair value through profit and loss	Available for sale	Held at fair value through profit and loss	Total	
Treasury bills	50,708.8	–	28.1	28.1	50,736.9
Securities purchased under resale agreements	89,991.1	1,893.5	–	1,893.5	91,884.6
Fixed-term loans and advances	61,196.6	–	–	–	61,196.6
Government and other securities					
Government	4,532.4	7,642.7	–	7,642.7	12,175.1
Financial institutions	30,814.0	1,012.5	603.8	1,616.3	32,430.4
Other (including public sector securities)	16,154.4	1,158.7	–	1,158.7	17,313.1
	51,500.8	9,813.9	603.8	10,417.7	61,918.5
Total currency assets	253,397.3	11,707.4	631.9	12,339.3	265,736.6

B. Currency assets available for sale

The Bank's currency investment assets relate principally to the investment of its equity. They are designated as available for sale unless they are part of an actively traded portfolio.

The table below analyses the movements in the Bank's currency assets available for sale:

For the financial year ended 31 March

SDR millions	**2009**	2008
Balance at beginning of year	11,707.4	9,843.8
Net change in currency assets available for sale		
Additions	10,805.7	20,990.3
Disposals	(4,633.8)	(2,195.9)
Maturities and other net movements	(7,193.1)	(17,315.0)
	(1,021.2)	1,479.4
Net change in transactions awaiting settlement	(109.8)	36.8
Fair value and other movements	282.9	347.4
Balance at end of year	**10,859.3**	11,707.4

Note 18 provides further analysis of the securities revaluation account. Note 26 provides further analysis of the net gain / (loss) on sales of securities designated as available for sale.

6. Loans and advances

Loans and advances comprise fixed-term loans and notice accounts.

Fixed-term loans are designated as held at fair value through profit and loss. Notice accounts are designated as loans and receivables and are included as cash and cash equivalents. These are very short-term financial assets, typically having a notice period of three days or less. These are included in the balance sheet at amortised cost.

As at 31 March

SDR millions	**2009**	2008
Fixed-term loans and advances	18,116.1	61,196.6
Notice accounts	396.6	899.3
Total loans and advances	**18,512.7**	62,095.9

The amount of the change in fair value recognised in the profit and loss account on fixed-term loans and advances is SDR (50.0) million (2008: SDR 88.8 million).

7. Derivative financial instruments

The Bank uses the following types of derivative instruments for economic hedging and trading purposes.

Interest rate and bond futures are contractual obligations to receive or pay a net amount based on changes in interest rates or bond prices on a future date at a specified price established in an organised market. Futures contracts are settled daily with the exchange. Associated margin payments are settled by cash or marketable securities.

Currency and gold options are contractual agreements under which the seller grants the purchaser the right, but not the obligation, to either buy (call option) or sell (put option), by or on a set date, a specific amount of a currency or gold at a predetermined price. In consideration, the seller receives a premium from the purchaser.

Currency and gold swaps, cross-currency interest rate swaps and interest rate swaps are commitments to exchange one set of cash flows for another. Swaps result in an economic exchange of currencies, gold or interest rates (for example, fixed rate for floating rate) or a combination of interest rates and currencies (cross-currency interest rate swaps). Except for certain currency and gold swaps and cross-currency interest rate swaps, no exchange of principal takes place.

Currency and gold forwards represent commitments to purchase foreign currencies or gold at a future date. This includes undelivered spot transactions.

Forward rate agreements are individually negotiated interest rate forward contracts that result in cash settlement at a future date for the difference between a contracted rate of interest and the prevailing market rate.

Swaptions are options under which the seller grants the purchaser the right, but not the obligation, to enter into a currency or interest rate swap at a predetermined price by or on a set date. In consideration, the seller receives a premium from the purchaser.

In addition, the Bank sells products to its customers which contain embedded derivatives (see notes 10 and 11). Embedded derivatives are separated from the host contract for accounting purposes and treated as though they are regular derivatives where the host contract is not accounted for as held at fair value. As such, the gold currency options embedded in gold dual currency deposits are included within derivatives as currency and gold options.

The table below analyses the fair value of derivative financial instruments:

As at 31 March	**2009**			2008		
	Notional amounts	Fair values		Notional amounts	Fair values	
SDR millions		Assets	Liabilities		Assets	Liabilities
Bond futures	1,862.4	1.2	(1.4)	1,367.8	1.4	(1.4)
Cross-currency interest rate swaps	2,708.0	95.6	(400.7)	3,836.0	117.6	(750.7)
Currency and gold forwards	3,047.4	7.3	(173.0)	1,095.0	21.0	(13.4)
Currency and gold options	5,030.1	156.6	(158.2)	4,669.0	64.0	(64.9)
Currency and gold swaps	99,578.6	2,860.4	(1,294.1)	127,026.0	1,372.2	(3,119.1)
Forward rate agreements	10,875.9	20.0	(13.3)	26,377.0	22.2	(27.3)
Interest rate futures	12,430.4	0.3	(0.9)	10,114.0	0.9	(0.2)
Interest rate swaps	393,413.7	10,600.8	(4,761.2)	360,306.4	5,824.7	(2,194.0)
Swaptions	2,016.9	6.9	(14.0)	6,162.7	2.4	(56.7)
Total derivative financial instruments at end of year	**530,963.4**	**13,749.1**	**(6,816.8)**	540,953.9	7,426.4	(6,227.7)
Net derivative financial instruments at end of year			**6,932.3**			1,198.7

There is no active secondary market for certain of the Bank's derivatives. These derivative assets and liabilities are valued using valuation techniques which require judgment to determine appropriate valuation parameters. A 1 basis point change in spread assumptions would have had an impact on the valuation of SDR 8.9 million (2008: SDR 16.0 million).

8. Accounts receivable

As at 31 March		
SDR millions	**2009**	2008
Financial transactions awaiting settlement	5,811.5	5,301.1
Other assets	11.0	10.7
Total accounts receivable	**5,822.5**	5,311.8

"Financial transactions awaiting settlement" relates to short-term receivables (typically due in three days or less) where transactions have been effected but cash has not yet been transferred. This includes assets that have been sold and liabilities that have been issued.

9. Land, buildings and equipment

For the financial year ended 31 March				2009	2008
SDR millions	Land	Buildings	IT and other equipment	Total	Total
Historical cost					
Balance at beginning of year	**41.2**	**189.4**	**118.5**	**349.1**	334.4
Capital expenditure	–	–	12.7	12.7	15.0
Disposals and retirements	–	–	(0.2)	(0.2)	(0.3)
Balance at end of year	**41.2**	**189.4**	**131.0**	**361.6**	349.1
Depreciation					
Accumulated depreciation at beginning of year	–	**84.7**	**74.0**	**158.7**	146.4
Depreciation	–	4.0	8.1	12.1	12.6
Disposals and retirements	–	–	(0.2)	(0.2)	(0.3)
Balance at end of year	**–**	**88.7**	**81.9**	**170.6**	158.7
Net book value at end of year	**41.2**	**100.7**	**49.1**	**191.0**	190.4

The depreciation charge for the financial year ended 31 March 2009 includes an additional charge of SDR 0.4 million for IT and other equipment following an impairment review (2008: SDR 1.1 million).

10. Currency deposits

Currency deposits are book entry claims on the Bank. The currency deposit instruments are analysed in the table below:

As at 31 March

SDR millions	**2009**	2008
Deposit instruments repayable at one to two days' notice		
Medium-Term Instruments (MTIs)	86,243.7	99,372.5
Callable MTIs	2,652.9	8,024.2
FIXBIS	32,664.4	44,403.4
	121,561.0	151,800.1
Other currency deposits		
FRIBIS	204.3	4,218.1
Fixed-term deposits	43,633.2	39,444.8
Dual Currency Deposits (DCDs)	237.4	161.4
Sight and notice deposit accounts	31,586.3	40,496.5
	75,661.2	84,320.8
Total currency deposits	**197,222.2**	236,120.9
Comprising:		
Designated as held at fair value through profit and loss	165,635.9	195,624.4
Designated as financial liabilities measured at amortised cost	31,586.3	40,496.5

Medium-Term Instruments (MTIs) are fixed rate investments at the BIS for quarterly maturities of up to 10 years.

Callable MTIs are MTIs that are callable at the option of the Bank at an exercise price of par, with call dates between June 2009 and December 2009 (2008: June 2008 and December 2009).

FIXBIS are fixed rate investments at the BIS for any maturities between one week and one year.

FRIBIS are floating rate investments at the BIS with maturities of one year or longer for which the interest rate is reset in line with prevailing market conditions.

Fixed-term deposits are fixed rate investments at the BIS, typically with a maturity of less than one year.

Dual Currency Deposits (DCDs) are fixed-term deposits that are repayable on the maturity date either in the original currency or at a fixed amount in a different currency at the option of the Bank. These deposits all matured between 2 April 2009 and 15 May 2009 (2008: in April 2008).

Sight and notice deposit accounts are very short-term financial liabilities, typically having a notice period of three days or less. They are designated as financial liabilities measured at amortised cost.

The Bank acts as a sole market-maker in certain of its currency deposit liabilities and has undertaken to repay at fair value some of these financial instruments, in whole or in part, at one to two business days' notice.

A. Valuation of currency deposits

Currency deposits (other than sight and notice deposit accounts) are included in the balance sheet at fair value. This value differs from the amount that the Bank is contractually required to pay at maturity to the holder of the deposit. For total currency deposits the amount that the Bank is contractually required to pay at maturity to the holder of the deposit, plus accrued interest to 31 March 2009, is SDR 193,629.2 million (2008: SDR 234,822.0 million).

The Bank uses valuation techniques to estimate the fair value of its currency deposits. These valuation techniques comprise discounted cash flow models and option pricing models. The discounted cash flow models value the expected cash flows of financial instruments using discount factors that are partly derived from quoted interest rates (eg Libor and swap rates) and partly based on assumptions about spreads at which each product is offered to and repurchased from customers.

The spread assumptions are based on recent market transactions in each product. Where the product series has been closed to new investors (and thus there are no recent market transactions) the Bank uses the latest quoted spread for the series as the basis for determining the appropriate model inputs.

The option pricing models include assumptions about volatilities that are derived from market quotes.

A change of 1 basis point in spread assumptions used for valuing currency deposits at the balance sheet date would have had an impact on the Bank's valuation of SDR 18.5 million (2008: SDR 24.0 million).

B. Impact of changes in the Bank's creditworthiness

The fair value of the Bank's liabilities would be affected by any change in its creditworthiness. If the Bank's creditworthiness deteriorated, the value of its liabilities would decrease, and the change in value would be reflected as a valuation movement in the profit and loss account. The Bank regularly assesses its creditworthiness as part of its risk management processes. The Bank's assessment of its creditworthiness did not indicate a change which could have had an impact on the fair value of the Bank's liabilities during the period under review.

11. Gold deposits

Gold deposits placed with the Bank originate entirely from central banks. They are all designated as financial liabilities measured at amortised cost.

The Bank also takes gold deposits that are repayable on the maturity date either in gold or at a fixed amount of currency at the option of the Bank (gold dual currency deposits). The embedded gold currency option is included in the balance sheet as a derivative financial instrument and is accounted for at fair value. There were no gold dual currency deposits at 31 March 2009 (2008: SDR 54.1 million).

12. Securities sold under repurchase agreements

Securities sold under repurchase agreements ("repo" liabilities) are transactions under which the Bank receives a fixed-term deposit from a counterparty to which it provides collateral in the form of securities. The rate on the deposit is fixed at the beginning of the transaction, and there is an irrevocable commitment to repay the deposit subject to the return of equivalent securities. Securities sold under repurchase agreements originate entirely from commercial banks.

There were no securities sold under repurchase agreements at 31 March 2009. As at 31 March 2008 all of the securities sold under repurchase agreements were associated with the management of currency assets available for sale. They were therefore all designated as financial liabilities measured at amortised cost.

13. Accounts payable

Accounts payable consist of financial transactions awaiting settlement, relating to short-term payables (typically payable within three days or less) where transactions have been effected but cash has not yet been transferred. This includes assets that have been purchased and liabilities that have been repurchased.

14. Other liabilities

As at 31 March *SDR millions*	**2009**	2008
Post-employment benefit obligations (see note 19)		
Staff pensions	2.4	–
Directors' pensions	4.8	4.8
Health and accident benefits	191.6	185.4
Short positions in currency assets	151.6	115.6
Payable to former shareholders	0.5	0.6
Other	17.3	20.1
Total other liabilities	**368.2**	326.5

15. Share capital

The Bank's share capital consists of:

As at 31 March *SDR millions*	**2009**	2008
Authorised capital: 600,000 shares, each of SDR 5,000 par value, of which SDR 1,250 is paid up	3,000.0	3,000.0
Issued capital: 547,125 shares	2,735.6	2,735.6
Paid-up capital (25%)	**683.9**	683.9

The number of shares eligible for dividend is:

As at 31 March	**2009**	2008
Issued shares	547,125	547,125
Less: shares held in treasury	(1,000)	(1,000)
Outstanding shares eligible for full dividend	**546,125**	546,125
Dividend per share (in SDR)	**265**	265

16. Statutory reserves

The Bank's Statutes provide for application of the Bank's annual net profit by the Annual General Meeting on the proposal of the Board of Directors to three specific reserve funds: the legal reserve fund, the general reserve fund and the special dividend reserve fund; the remainder of the net profit after payment of any dividend is generally allocated to the free reserve fund.

Legal reserve fund. This fund is currently fully funded at 10% of the Bank's paid-up capital.

General reserve fund. After payment of any dividend, 10% of the remainder of the Bank's annual net profit currently must be allocated to the general reserve fund. When the balance of this fund equals five times the Bank's paid-up capital, such annual contribution will decrease to 5% of the remainder of the annual net profit.

Special dividend reserve fund. A portion of the remainder of the annual net profit may be allocated to the special dividend reserve fund, which shall be available, in case of need, for paying the whole or any part of a declared dividend. Dividends are normally paid out of the Bank's net profit.

Free reserve fund. After the above allocations have been made, any remaining unallocated net profit is generally transferred to the free reserve fund.

Receipts from the subscription of BIS shares are allocated to the legal reserve fund as necessary to keep it fully funded, with the remainder being credited to the general reserve fund.

The free reserve fund, general reserve fund and legal reserve fund are available, in that order, to meet any losses incurred by the Bank. In the event of liquidation of the Bank, the balances of the reserve funds (after the discharge of the liabilities of the Bank and the costs of liquidation) would be divided among the Bank's shareholders.

17. Shares held in treasury

For the financial year ended 31 March	**2009**	2008
Balance at beginning of year	1,000	1,000
Movements during the year	–	–
Balance at end of year	**1,000**	1,000

The shares held in treasury consist of 1,000 shares of the Albanian issue which were suspended in 1977.

18. Other equity accounts

Other equity accounts represent the revaluation accounts of the currency assets available for sale and gold investment assets, which are further described in notes 4 and 5.

Other equity accounts comprise:

As at 31 March

SDR millions	**2009**	2008
Securities revaluation account	431.1	272.0
Gold revaluation account	1,789.2	1,636.8
Total other equity accounts	**2,220.3**	1,908.8

A. Securities revaluation account

This account contains the difference between the fair value and the amortised cost of the Bank's currency assets available for sale.

The movements in the securities revaluation account were as follows:

For the financial year ended 31 March

SDR millions	**2009**	2008
Balance at beginning of year	272.0	(80.5)
Net valuation movement		
Net (gain) / loss on sales	(123.8)	5.1
Fair value and other movements	282.9	347.4
	159.1	352.5
Balance at end of year	**431.1**	272.0

The tables below analyse the balance in the securities revaluation account:

As at 31 March 2009 *SDR millions*	Fair value of assets	Historical cost	Securities revaluation account	Gross gains	Gross losses
Government and other securities and Total	**10,859.3**	**10,428.2**	**431.1**	**447.3**	**(16.2)**

As at 31 March 2008 *SDR millions*	Fair value of assets	Historical cost	Securities revaluation account	Gross gains	Gross losses
Securities purchased under resale agreements	1,893.5	1,894.2	(0.7)	–	(0.7)
Government and other securities	9,813.9	9,541.2	272.7	305.4	(32.7)
Total	11,707.4	11,435.4	272.0	305.4	(33.4)

B. Gold revaluation account

This account contains the difference between the book value and the deemed cost of the Bank's gold investment assets. For gold investment assets held on 31 March 2003 (when the Bank changed its functional and presentation currency from the gold franc to the SDR) the deemed cost is approximately SDR 151 per ounce, based on the value of USD 208 that was applied from 1979 to 2003 in accordance with a decision by the Bank's Board of Directors, translated at the 31 March 2003 exchange rate.

The movements in the gold revaluation account were as follows:

For the financial year ended 31 March

SDR millions	**2009**	2008
Balance at beginning of year	1,636.8	1,384.0
Net valuation movement		
Net gain on sales	(77.0)	(293.3)
Gold price movement	229.4	546.1
	152.4	252.8
Balance at end of year	**1,789.2**	1,636.8

19. Post-employment benefit obligations

The Bank operates three post-employment arrangements:

1. A final salary defined benefit pension arrangement for its staff. The pension arrangement is based on a fund without separate legal personality, out of which benefits are paid. The fund assets are administered by the Bank for the sole benefit of current and former members of staff who participate in the arrangement. The Bank remains ultimately liable for all benefits due under the arrangement.

2. An unfunded defined benefit arrangement for its Directors, whose entitlement is based on a minimum service period of four years.

3. An unfunded post-employment health and accident benefit arrangement for its staff. Entitlement to this arrangement is based in principle on the employee remaining in service up to 50 years of age and the completion of a minimum service period of 10 years.

All arrangements are valued annually by independent actuaries.

A. Amounts recognised in the balance sheet

As at 31 March	Staff pensions			
SDR millions	**2009**	2008	2007	2006
Present value of obligation	(747.4)	(709.7)	(653.7)	(606.4)
Fair value of fund assets	619.6	714.3	648.6	602.2
Funded status	(127.8)	4.6	(5.1)	(4.2)
Unrecognised actuarial losses	125.4	41.2	47.3	46.8
Unrecognised past service cost	–	(45.8)	(42.2)	(42.6)
Liability at end of year	**(2.4)**	–	–	–

As at 31 March	Directors' pensions			
SDR millions	**2009**	2008	2007	2006
Present value of obligation	(5.7)	(5.4)	(4.6)	(4.6)
Fair value of fund assets	–	–	–	–
Funded status	(5.7)	(5.4)	(4.6)	(4.6)
Unrecognised actuarial losses	0.9	0.6	0.3	0.3
Unrecognised past service cost	–	–	–	–
Liability at end of year	**(4.8)**	(4.8)	(4.3)	(4.3)

As at 31 March	Post-employment health and accident benefits			
SDR millions	**2009**	2008	2007	2006
Present value of obligation	(225.4)	(208.0)	(186.3)	(183.8)
Fair value of fund assets	–	–	–	–
Funded status	(225.4)	(208.0)	(186.3)	(183.8)
Unrecognised actuarial losses	40.1	30.3	42.0	57.2
Unrecognised past service cost	(6.3)	(7.7)	(7.8)	(8.6)
Liability at end of year	**(191.6)**	(185.4)	(152.1)	(135.2)

B. Present value of benefit obligation

The reconciliation of the opening and closing amounts of the present value of the benefit obligation is as follows:

As at 31 March	Staff pensions			Directors' pensions			Post-employment health and accident benefits		
SDR millions	**2009**	2008	2007	**2009**	2008	2007	**2009**	2008	2007
Present value of obligation at beginning of year	709.7	653.7	606.4	5.4	4.6	4.5	208.0	186.3	183.8
Current service cost	29.8	30.5	28.3	0.2	0.2	0.2	7.9	8.2	7.9
Employee contributions	3.9	3.7	3.4	–	–	–	0.1	–	–
Interest cost	24.9	21.3	19.8	0.2	0.1	0.1	7.4	6.1	6.1
Actuarial (gain) / loss	29.3	(55.7)	3.5	0.3	–	–	11.5	(13.9)	(13.9)
Benefit payments	(24.5)	(23.1)	(21.8)	(0.3)	(0.3)	(0.3)	(2.0)	(1.8)	(1.9)
Exchange differences	(25.7)	79.3	14.1	(0.1)	0.9	0.1	(7.5)	23.1	4.3
Present value of obligation at end of year	**747.4**	709.7	653.7	**5.7**	5.4	4.6	**225.4**	208.0	186.3

C. Fair value of fund assets for staff pensions

The reconciliation of the opening and closing amounts of the fair value of fund assets for the staff pension arrangement is as follows:

For the financial year ended 31 March			
SDR millions	**2009**	2008	2007
Fair value of fund assets at beginning of year	714.3	648.6	602.2
Expected return on fund assets	34.0	33.1	30.6
Actuarial gain / (loss)	(99.3)	(44.8)	4.1
Employer contributions	18.3	17.3	15.9
Employee contributions	3.9	3.7	3.4
Benefit payments	(24.5)	(23.1)	(21.8)
Exchange differences	(27.1)	79.5	14.2
Fair value of fund assets at end of year	**619.6**	714.3	648.6

D. Amounts recognised in the profit and loss account

For the financial year ended 31 March	Staff pensions			Directors' pensions			Post-employment health and accident benefits		
SDR millions	**2009**	2008	2007	**2009**	2008	2007	**2009**	2008	2007
Current service cost	29.8	30.5	28.3	0.2	0.2	0.2	7.9	8.2	7.9
Interest cost	24.9	21.3	19.8	0.2	0.1	0.1	7.4	6.1	6.1
Less: expected return on fund assets	(34.0)	(33.1)	(30.7)	–	–	–	–	–	–
Less: past service cost	–	(1.5)	(1.5)	–	–	–	(6.3)	(1.0)	(1.0)
Net actuarial losses recognised in year	–	–	–	–	–	–	–	1.6	2.6
Total included in operating expense	**20.7**	17.2	15.9	**0.4**	0.3	0.3	**9.0**	14.9	15.6

The Bank expects to make a contribution to its post-employment arrangements of CHF 41.8 million in 2009/10.

E. Major categories of fund assets as a percentage of total fund assets

As at 31 March

Percentages	**2009**	2008
European equities	7.4	12.8
Other equities	16.8	17.4
European fixed income	49.9	32.2
Other fixed income	21.8	27.1
Other assets	4.1	10.5
Actual return on fund assets	–10.5%	–1.7%

The staff pension fund does not invest in financial instruments issued by the Bank.

F. Principal actuarial assumptions used in these financial statements

As at 31 March

	2009	2008
Applicable to all three post-employment benefit arrangements		
Discount rate – market rate of highly rated Swiss corporate bonds	3.25%	3.75%
Applicable to staff and Directors' pension arrangements		
Assumed increase in pensions payable	1.50%	1.50%
Applicable to staff pension arrangement only		
Expected return on fund assets	5.00%	5.00%
Assumed salary increase rate	4.10%	4.10%
Applicable to Directors' pension arrangement only		
Assumed Directors' pensionable remuneration increase rate	1.50%	1.50%
Applicable to post-employment health and accident benefit arrangement only		
Long-term medical cost inflation assumption	5.00%	5.00%

The assumed increases in staff salaries, Directors' pensionable remuneration and pensions payable incorporate an inflation assumption of 1.5% at 31 March 2009 (2008: 1.5%).

The expected rate of return on fund assets is based on long-term expectations for inflation, interest rates, risk premia and asset allocations. The estimate takes into consideration historical returns and is determined in conjunction with the fund's independent actuaries.

The assumption for medical inflation has a significant effect on the amounts recognised in the profit and loss account. A 1% change in the assumption for medical inflation compared to that used for the 2008/09 calculation would have the following effects:

For the financial year ended 31 March

SDR millions	**2009**	2008
Increase / (decrease) of the total service and interest cost		
6% medical inflation	5.0	7.5
4% medical inflation	(3.6)	(4.9)

As at 31 March

SDR millions	**2009**	2008
Increase / (decrease) of the benefit obligation		
6% medical inflation	56.3	45.5
4% medical inflation	(42.5)	(34.5)

20. Interest income

For the financial year ended 31 March

SDR millions	**2009**	2008
Currency assets available for sale		
Securities purchased under resale agreements	18.5	71.1
Government and other securities	365.0	380.9
	383.5	452.0
Currency assets held at fair value through profit and loss		
Treasury bills	1,253.1	861.6
Securities purchased under resale agreements	1,880.8	2,480.9
Loans and advances	1,321.1	4,147.8
Government and other securities	1,766.8	2,301.2
	6,221.8	9,791.5
Assets designated as loans and receivables		
Sight and notice accounts	16.0	38.4
Gold investment assets	6.4	11.2
Gold banking assets	5.0	5.4
Impairment charge on gold banking assets	(18.3)	–
	9.1	55.0
Derivative financial instruments held at fair value through profit and loss	**1,640.5**	882.7
Total interest income	**8,254.9**	11,181.2

21. Interest expense

For the financial year ended 31 March

SDR millions	**2009**	2008
Liabilities held at fair value through profit and loss		
Currency deposits	**6,160.4**	8,963.7
Liabilities designated as financial liabilities measured at amortised cost		
Gold deposits	3.3	3.9
Sight and notice deposit accounts	472.0	1,171.7
Securities sold under repurchase agreements	17.3	68.5
	492.6	1,244.1
Total interest expense	**6,653.0**	10,207.8

22. Net valuation movement

The net valuation movement arises entirely on financial instruments designated as held at fair value through profit and loss. Included in the table below are net valuation losses of SDR 4.6 million arising from credit losses on default (2008: nil).

For the financial year ended 31 March

SDR millions	**2009**	2008
Currency assets held at fair value through profit and loss		
Unrealised valuation movements on currency assets	59.8	18.8
Realised gains / (losses) on currency assets	34.8	(11.7)
	94.6	7.1
Currency liabilities held at fair value through profit and loss		
Unrealised valuation movements on financial liabilities	(1,549.1)	(2,832.2)
Realised gains on financial liabilities	(1,139.6)	(257.2)
	(2,688.7)	(3,089.4)
Valuation movements on derivative financial instruments	**1,412.4**	2,528.6
Net valuation movement	**(1,181.7)**	(553.7)

23. Net fee and commission income

For the financial year ended 31 March

SDR millions	**2009**	2008
Fee and commission income	8.1	6.8
Fee and commission expense	(7.7)	(6.0)
Net fee and commission income	**0.4**	0.8

24. Net foreign exchange gain / (loss)

For the financial year ended 31 March

SDR millions	**2009**	2008
Net transaction gain	11.6	4.5
Net translation loss	(20.4)	(14.0)
Net foreign exchange gain / (loss)	**(8.8)**	(9.5)

25. Operating expense

The following table analyses the Bank's operating expense in Swiss francs (CHF), the currency in which most expenditure is incurred:

For the financial year ended 31 March

CHF millions	**2009**	2008
Board of Directors		
Directors' fees	2.0	1.9
Pensions to former Directors	0.5	0.6
Travel, external Board meetings and other costs	1.6	1.7
	4.1	4.2
Management and staff		
Remuneration	114.1	111.8
Pensions	34.3	34.3
Other personnel-related expense	45.4	43.1
	193.8	189.2
Office and other expense	**65.8**	63.5
Administrative expense in CHF millions	**263.7**	256.9
Administrative expense in SDR millions	154.4	141.9
Depreciation in SDR millions	12.1	12.6
Operating expense in SDR millions	**166.5**	154.5

The average number of full-time equivalent employees during the financial year ended 31 March 2009 was 532 (2008: 542).

26. Net gain / (loss) on sales of securities available for sale

For the financial year ended 31 March

SDR millions	**2009**	2008
Disposal proceeds	4,633.8	2,195.9
Amortised cost	(4,510.0)	(2,201.0)
Net gain / (loss)	**123.8**	(5.1)
Comprising:		
Gross realised gains	128.9	51.8
Gross realised losses	(5.1)	(56.9)

27. Net gain on sales of gold investment assets

For the financial year ended 31 March

SDR millions	**2009**	2008
Disposal proceeds	102.0	414.3
Deemed cost (see note 18B)	(25.0)	(121.0)
Net realised gain	**77.0**	293.3

28. Earnings per share

For the financial year ended 31 March	**2009**	2008
Net profit for the financial year (SDR millions)	446.1	544.7
Weighted average number of shares entitled to dividend	546,125	546,125
Basic and diluted earnings per share (SDR per share)	**816.8**	997.4

The dividend proposed for the financial year ended 31 March 2009 is SDR 265 per share (2008: SDR 265).

29. Cash and cash equivalents

For the purposes of the cash flow statement, cash and cash equivalents comprise:

As at 31 March

SDR millions	**2009**	2008
Cash and sight accounts with banks	915.2	36.8
Notice accounts	396.6	899.3
Total cash and cash equivalents	**1,311.8**	936.1

30. Taxes

The Bank's special legal status in Switzerland is set out principally in its Headquarters Agreement with the Swiss Federal Council. Under the terms of this document the Bank is exempted from virtually all direct and indirect taxes at both federal and local government level in Switzerland.

Similar agreements exist with the government of the People's Republic of China for the Asian Office in Hong Kong SAR and with the Mexican government for the Office for the Americas.

31. Exchange rates

The following table shows the principal rates and prices used to translate balances in foreign currency and gold into SDR:

	Spot rate as at 31 March		Average rate for the financial year ended	
	2009	2008	**2009**	2008
USD	**0.670**	0.609	**0.648**	0.643
EUR	**0.890**	0.960	**0.908**	0.910
JPY	**0.00677**	0.00610	**0.00654**	0.00564
GBP	**0.962**	1.208	**1.088**	1.291
CHF	**0.590**	0.612	**0.584**	0.556
Gold (in ounces)	**614.6**	557.8	**560.4**	490.2

32. Off-balance sheet items

Fiduciary transactions are effected in the Bank's name on behalf of, and at the risk of, the Bank's customers without recourse to the Bank. They are not included in the Bank's balance sheet and comprise:

As at 31 March

SDR millions	**2009**	2008
Safe custody arrangements	11,082.0	11,308.0
Collateral pledge agreements	90.0	158.9
Portfolio management mandates	6,919.0	6,093.9
Gold bars held under earmark	4,078.9	3,665.4
Total	**22,169.9**	21,226.2

The above table includes the nominal value of securities held under safe custody and collateral pledge arrangements, and the net asset value of portfolio management mandates. Gold bars held under earmark are included at their weight in gold (translated at the gold market price and the USD exchange rate into SDR). At 31 March 2009 gold bars held under earmark amounted to 212 tonnes of fine gold (2008: 204 tonnes).

The financial instruments held under the above arrangements are deposited with external custodians, either central banks or commercial institutions.

33. Commitments

The Bank provides a number of committed standby facilities for its customers. As at 31 March 2009 the outstanding commitments to extend credit under these committed standby facilities amounted to SDR 8,646.8 million (2008: SDR 6,767.7 million), of which SDR 234.5 million was uncollateralised (2008: SDR 304.6 million).

34. Effective interest rates

The effective interest rate is the rate that discounts the expected future cash flows of a financial instrument to the current book value.

The tables below summarise the effective interest rate by major currency for applicable financial instruments:

As at 31 March 2009

Percentages	USD	EUR	GBP	JPY	Other currencies
Assets					
Gold loans	–	–	–	–	0.54
Treasury bills	0.88	1.83	0.69	0.23	–
Securities purchased under resale agreements	0.16	0.62	0.63	0.10	–
Loans and advances	0.84	1.29	0.87	0.08	0.40
Government and other securities	2.50	3.24	3.26	0.86	3.88
Liabilities					
Currency deposits	2.00	2.00	2.05	0.16	2.05
Gold deposits	–	–	–	–	0.38
Short positions in currency assets	4.96	–	–	–	–

As at 31 March 2008

Percentages	USD	EUR	GBP	JPY	Other currencies
Assets					
Gold loans	–	–	–	–	0.76
Treasury bills	0.73	4.02	–	0.58	–
Securities purchased under resale agreements	1.90	2.69	5.15	0.71	–
Loans and advances	3.87	4.18	5.71	0.85	3.24
Government and other securities	3.21	4.10	4.19	0.98	7.39
Liabilities					
Currency deposits	3.24	3.77	5.00	0.34	5.16
Gold deposits	–	–	–	–	0.35
Securities sold under repurchase agreements	1.65	–	5.10	–	–
Short positions in currency assets	4.03	–	–	–	–

35. Geographical analysis

A. Total liabilities

As at 31 March

SDR millions	**2009**	2008
Africa and Europe	109,733.3	132,229.9
Asia-Pacific	82,770.5	102,353.8
Americas	40,344.5	54,810.3
International organisations	8,822.5	8,642.0
Total	**241,670.8**	298,036.0

B. Off-balance sheet items

As at 31 March

SDR millions	**2009**	2008
Africa and Europe	5,361.6	4,877.1
Asia-Pacific	16,165.1	15,825.5
Americas	643.2	523.6
Total	**22,169.9**	21,226.2

Note 32 provides further analysis of the Bank's off-balance sheet items. A geographical analysis of the Bank's assets is provided in the "Risk management" section, note 3C below.

C. Credit commitments

As at 31 March

SDR millions	**2009**	2008
Africa and Europe	1,073.3	496.6
Asia-Pacific	7,573.5	6,109.7
Americas	–	161.4
Total	**8,646.8**	6,767.7

Note 33 provides further analysis of the Bank's credit commitments.

36. Related parties

The Bank considers the following to be its related parties:

- the members of the Board of Directors;
- the senior officials of the Bank;
- close family members of the above individuals;
- enterprises which could exert significant influence over a member of the Board of Directors or senior official, and enterprises over which one of these individuals could exert significant influence;
- the Bank's post-employment benefit arrangements; and
- central banks whose Governor is a member of the Board of Directors and institutions that are connected with these central banks.

A listing of the members of the Board of Directors and senior officials is shown in the section of the Annual Report entitled "Board of Directors and senior officials". Note 19 provides details of the Bank's post-employment benefit arrangements.

A. Related party individuals

The total compensation of senior officials recognised in the profit and loss account amounted to:

For the financial year ended 31 March

CHF millions	**2009**	2008
Salaries, allowances and medical cover	6.4	6.7
Post-employment benefits	1.7	1.9
Total compensation in CHF millions	**8.1**	8.6
SDR equivalent	4.7	4.8

Note 25 provides details of the total compensation of the Board of Directors.

The Bank offers personal deposit accounts for all staff members and its Directors. The accounts bear interest at a rate determined by the Bank based on the rate offered by the Swiss National Bank on staff accounts. The movements and total balance on personal deposit accounts relating to members of the Board of Directors and the senior officials of the Bank were as follows:

For the financial year ended 31 March

CHF millions	**2009**	2008
Balance at beginning of year	18.0	15.6
Deposits taken including interest income (net of withholding tax)	3.4	3.8
Withdrawals	(8.6)	(1.4)
Balance at end of year in CHF millions	**12.8**	18.0
SDR equivalent	7.6	11.0
Interest expense on deposits in CHF millions	0.7	0.6
SDR equivalent	0.4	0.3

Balances related to individuals who are appointed as members of the Board of Directors or as senior officials of the Bank during the financial year are included in the table above along with other deposits taken. Balances related to individuals who cease to be members of the Board of Directors or senior officials of the Bank during the financial year are included in the table above along with other withdrawals.

In addition, the Bank operates a blocked personal deposit account for certain staff members who were previously members of the Bank's savings fund, which closed on 1 April 2003. The terms of these blocked accounts are such that staff members cannot make further deposits and balances are paid out when they leave the Bank. The accounts bear interest at a rate determined by the Bank based on the rate offered by the Swiss National Bank on staff accounts plus 1%. The total balance of blocked accounts at 31 March 2009 was SDR 19.2 million (2008: SDR 20.8 million). They are reported under the balance sheet heading "Currency deposits".

B. Related party central banks and connected institutions

The BIS provides banking services to its customers, who are predominantly central banks, monetary authorities and international financial institutions. In fulfilling this role, the Bank in the normal course of business enters into transactions with related party central banks and connected institutions. These transactions include making advances, and taking currency and gold deposits.

It is the Bank's policy to enter into transactions with related party central banks and connected institutions on similar terms and conditions to transactions with other, non-related party customers.

Currency deposits from related party central banks and connected institutions

For the financial year ended 31 March

SDR millions	**2009**	2008
Balance at beginning of year	53,998.3	53,240.1
Deposits taken	120,912.0	130,847.9
Maturities, repayments and fair value movements	(123,325.4)	(129,656.6)
Net movement on call / notice accounts	(1,109.5)	(433.1)
Balance at end of year	**50,475.4**	53,998.3
Percentage of total currency deposits at end of year	25.6%	22.9%

Gold deposits from related party central banks and connected institutions

For the financial year ended 31 March

SDR millions	**2009**	2008
Balance at beginning of year	26,336.1	10,123.8
Deposits taken	55.0	600.2
Net movement on gold sight accounts	(6,703.6)	16,161.2
Net withdrawals and gold price movements	(218.8)	(549.1)
Balance at end of year	**19,468.7**	26,336.1
Percentage of total gold deposits at end of year	84.5%	90.5%

Securities purchased under resale transactions with related party central banks and connected institutions

For the financial year ended 31 March

SDR millions	**2009**	2008
Balance at beginning of year	3,271.9	470.2
Collateralised deposits placed	889,828.4	776,745.9
Maturities and fair value movements	(888,497.8)	(773,944.2)
Balance at end of year	**4,602.5**	3,271.9
Percentage of total securities purchased under resale agreements at end of year	11.9%	3.6%

Other balances with related party central banks and connected institutions

The Bank maintains sight accounts in currencies with related party central banks and connected institutions, the total balance of which was SDR 881.5 million as at 31 March 2009 (2008: SDR 539.3 million). Gold held in sight accounts with related party central banks and connected institutions totalled SDR 22,605.8 million as at 31 March 2009 (2008: SDR 27,499.7 million).

Derivative transactions with related party central banks and connected institutions

The BIS enters into derivative transactions with its related party central banks and connected institutions, including foreign exchange deals and interest rate swaps. The total nominal value of these transactions with related party central banks and connected institutions during the year ended 31 March 2009 was SDR 6,510.0 million (2008: SDR 43,655.5 million).

37. Contingent liabilities

At 31 March 2009, the Bank had no material contingent liabilities.

Capital adequacy

1. Capital

The table below shows the composition of the Bank's Tier 1 and total capital as at 31 March 2009.

As at 31 March

SDR millions	**2009**	2008
Share capital	683.9	683.9
Statutory reserves per balance sheet	10,367.3	9,967.3
Less: shares held in treasury	(1.7)	(1.7)
Tier 1 capital	**11,049.5**	10,649.5
Profit and loss account	446.1	544.7
Other equity accounts	2,220.3	1,908.8
Total capital	**13,715.9**	13,103.0

The Bank assesses its capital adequacy continuously. The assessment is supported by an annual capital and business planning process.

The Bank has implemented a risk framework that is consistent with the revised *International Convergence of Capital Measurement and Capital Standards* (Basel II Framework) issued by the Basel Committee on Banking Supervision in June 2006. The implementation includes all three pillars of the Framework, and takes the particular scope and nature of the Bank's activities into account. Since the Bank is not subject to national banking supervisory regulation, the application of Pillar 2 is limited to the Bank's own assessment of capital adequacy. This assessment is based primarily on an economic capital methodology which is more comprehensive and geared to a substantially higher solvency level than the minimum Pillar 1 capital level required by the Basel II Framework.

2. Economic capital

The Bank's own assessment of its capital adequacy is performed on the basis of its economic capital frameworks for market risk, credit risk, operational risk and other risks. These are designed to determine the amount of equity needed to absorb losses arising from its exposures to a statistical level of confidence consistent with the objective to maintain superior credit quality. The Bank's economic capital frameworks measure economic capital to a 99.995% confidence interval assuming a one-year holding period.

The following table summarises the Bank's economic capital utilisation for credit risk, market risk and operational risk as at 31 March 2009. Furthermore, since 1 April 2008, an additional amount of economic capital has been set aside for other risks based on Management's assessment of risks which are not, or not fully, reflected in the Bank's economic capital calculations.

As at 31 March

SDR millions	**2009**	2008
Credit risk	5,673.7	6,173.3
Market risk	3,099.8	2,689.7
Operational risk	425.0	400.0
Other risks	300.0	–
Total economic capital utilisation	**9,498.5**	9,263.0

3. Risk-weighted assets and minimum capital requirements under the Basel II Framework

The Basel II Framework includes several approaches for calculating risk-weighted assets and the corresponding minimum capital requirements. In principle, the minimum capital requirements are determined by taking 8% of the risk-weighted assets.

The following table summarises the relevant exposure types and approaches as well as the risk-weighted assets and the minimum capital requirements for credit risk, market risk and operational risk.

As at 31 March		**2009**			2008		
	Approach used	Amount of exposure	Risk-weighted assets (A)	Minimum capital requirement (B)	Amount of exposure	Risk-weighted assets (A)	Minimum capital requirement (B)
SDR millions							
Credit risk							
Exposure to sovereigns, banks and corporates	Advanced internal ratings-based approach, where (B) is derived as (A) x 8%	225,017.7	10,114.8	809.2	281,560.2	11,715.2	937.2
Securitisation exposures, externally managed portfolios and other assets	Standardised approach, where (B) is derived as (A) x 8%	3,342.2	1,291.0	103.3	4,048.3	1,349.1	107.9
Market risk							
Exposure to foreign exchange risk and gold price risk	Internal models approach, where (A) is derived as (B) / 8%	–	15,783.5	1,262.7	–	8,197.5	655.8
Operational risk	Advanced measurement approach, where (A) is derived as (B) / 8%	–	2,250.0	180.0	–	1,962.5	157.0
Total			**29,439.3**	**2,355.2**		23,224.3	1,857.9

For credit risk, the Bank has adopted the advanced internal ratings-based approach for the majority of its exposures. Under this approach, the risk weighting for a transaction is determined by the relevant Basel II risk weight function using the Bank's own estimates for key inputs. For certain exposures, the Bank has adopted the standardised approach. Under this approach, risk weightings are mapped to exposure types.

Risk-weighted assets for market risk are derived following an internal models approach. For operational risk, the advanced measurement approach is used. Both these approaches rely on value-at-risk (VaR) methodologies. The minimum capital requirements are derived from the VaR figures and are translated into risk-weighted assets taking into account the 8% minimum capital requirement.

More details on the assumptions underlying the calculations are provided in the sections on credit risk, market risk and operational risk.

4. Tier 1 capital ratio

The capital ratio measures capital adequacy by comparing the Bank's Tier 1 capital with its risk-weighted assets. The table below shows the Bank's Tier 1 capital ratio, consistent with the Basel II Framework.

As at 31 March

SDR millions	**2009**	2008
Tier 1 capital	11,049.5	10,649.5
Less: expected loss	(13.9)	(30.9)
Tier 1 capital net of expected loss (A)	**11,035.6**	10,618.6
Total risk-weighted assets (B)	29,439.3	23,224.3
Tier 1 capital ratio (A) / (B)	**37.5%**	45.7%

As required by the Basel II Framework, expected loss is calculated for credit risk exposures subject to the advanced internal ratings-based approach. The expected loss is calculated at the balance sheet date taking into account the impairment charge which is reflected in the Bank's profit and loss account. Note 4 provides details of the impairment charge. The expected loss is deducted from the Bank's Tier 1 capital in accordance with the requirements of the Basel II Framework.

The Bank maintains a very high creditworthiness and performs a comprehensive capital assessment considering its specific characteristics. As such, it maintains a capital position substantially in excess of the minimum requirement.

The Bank's Tier 1 ratio under the 1988 Basel Capital Accord was 50.8% as at 31 March 2009 (2008: 34.6%). The material difference between the Bank's Tier 1 capital ratio under the Basel II Framework and the 1988 Accord is attributable mainly to the higher risk sensitivity of the Basel II approaches.

Risk management

1. Risks faced by the Bank

The Bank supports its customers, predominantly central banks, monetary authorities and international financial institutions, in the management of their reserves and related financial activities.

Banking activities form an essential element of meeting the Bank's objectives and as such ensure its financial strength and independence. The BIS engages in banking activities that are customer-related as well as activities that are related to the investment of its equity, each of which may give rise to financial risk comprising credit risk, market risk and liquidity risk. The Bank is also exposed to operational risk.

Within the risk framework defined by the Board of Directors, the Management of the Bank has established risk management policies designed to ensure that risks are identified, appropriately measured and limited as well as monitored and reported.

2. Risk management approach and organisation

General approach

The Bank maintains superior credit quality and adopts a prudent approach to financial risk-taking, by:

- maintaining an exceptionally strong capital position;
- investing its assets predominantly in high credit quality financial instruments;
- seeking to diversify its assets across a range of sectors;
- adopting a conservative approach to its tactical market risk-taking and carefully managing market risk associated with the Bank's strategic positions, which include its gold holdings; and
- maintaining a high level of liquidity.

A. Organisation

Under Article 39 of the Bank's Statutes, the General Manager is responsible to the Board for the management of the Bank, and is assisted by the Deputy General Manager. The Deputy General Manager is responsible for the Bank's independent risk control and compliance functions. The General Manager and the Deputy General Manager are supported by senior management advisory committees.

The key advisory committees are the Executive Committee, the Finance Committee and the Compliance and Operational Risk Committee. The first two committees are chaired by the General Manager and the third by the Deputy General Manager, and all include other senior members of the Bank's Management. The Executive Committee advises the General Manager primarily on the Bank's strategic planning and the allocation of resources, as well as on decisions related to the broad financial objectives for the banking activities and operational risk management. The Finance Committee advises the General Manager on the financial management and policy issues related to the banking business, including the allocation of economic capital to risk categories. The Compliance and Operational Risk Committee acts as an advisory committee to the Deputy General Manager and ensures the coordination of compliance matters and operational risk management throughout the Bank.

The independent risk control function for financial risks is performed by the Risk Control unit. The independent operational risk control function is shared between Risk Control, which maintains the operational risk quantification, and the Compliance and Operational Risk Unit. Both units report directly to the Deputy General Manager.

The Bank's compliance function is performed by the Compliance and Operational Risk Unit. The objective of this function is to provide reasonable assurance that the activities of the Bank and its staff conform to applicable laws and regulations, the BIS Statutes, the Bank's Code of Conduct and other internal rules, policies and relevant standards of sound practice.

The Compliance and Operational Risk Unit identifies and assesses compliance risks and guides and educates staff on compliance issues. The Head of the Compliance and Operational Risk Unit also has a direct reporting line to the Audit Committee, which is an advisory committee to the Board of Directors.

The Finance unit and the Legal Service complement the Bank's risk management. The Finance unit operates an independent valuation control function, produces the Bank's financial statements and controls the Bank's expenditure through setting and monitoring the annual budget. The objective of the independent valuation control function is to ensure that the Bank's valuations comply with its valuation policy and procedures, and that the processes and procedures which influence the Bank's valuations conform to best practice guidelines. The Finance unit has a direct reporting line to the Secretary General.

The Legal Service provides legal advice and support covering a wide range of issues relating to the Bank's activities. The Legal Service has a direct reporting line to the General Manager.

The Internal Audit function reviews internal control procedures and reports on how they comply with internal standards and industry best practices. The scope of internal audit work includes the review of risk management procedures, internal control systems, information systems and governance processes. Internal Audit has a direct reporting line to the Audit Committee and is responsible to the General Manager and the Deputy General Manager.

B. Risk monitoring and reporting

The Bank's financial and operational risk profile, position and performance are monitored on an ongoing basis by the relevant units. Financial risk and compliance reports aimed at various management levels are regularly provided to enable Management to adequately assess the Bank's risk profile and financial condition.

Management reports financial and risk information to the Board of Directors on a bimonthly basis. Furthermore, the Audit Committee receives regular reports from Internal Audit, the Compliance and Operational Risk Unit and the Finance unit. The Banking and Risk Management Committee, another advisory committee to the Board, receives an annual report from the Risk Control unit. The preparation of reports is subject to comprehensive policies and procedures, thus ensuring strong controls.

C. Risk methodologies

The Bank uses a comprehensive range of quantitative methodologies for valuing financial instruments and for measuring risk to the Bank's net profit and its equity. The Bank reassesses its quantitative methodologies in the light of its changing risk environment and evolving best practice.

The Bank's model validation policy defines the roles and responsibilities and processes related to the implementation of new or materially changed risk models.

A key methodology used by the Bank to measure and manage risk is the calculation of economic capital based on value-at-risk (VaR) techniques. VaR expresses the statistical estimate of the maximum potential loss on the current positions of the Bank measured to a specified level of confidence and a specified time horizon.

The Bank's economic capital calculation is designed to measure the amount of equity needed to absorb losses arising from its exposures to a statistical level of confidence determined by the Bank's aim to remain of the highest creditworthiness.

The Bank assesses its capital adequacy on the basis of economic capital frameworks for market risk, credit risk, operational risk and other risks, supplemented by sensitivity and risk factor analyses. The Bank's economic capital frameworks measure economic capital to a 99.995% confidence interval assuming a one-year holding period.

The Bank allocates economic capital to the above risk categories. An additional amount of economic capital is set aside based on Management's assessment of risks which are not or not fully reflected in the economic capital calculations.

A comprehensive stress testing framework complements the Bank's risk assessment including its VaR and economic capital calculations for financial risk. The Bank's key market risk factors and credit exposures are stress-tested. The stress testing includes the analysis of severe historical and adverse hypothetical macroeconomic scenarios, as well as sensitivity tests of extreme but still plausible movements of the key risk factors identified. The Bank also performs stress tests related to liquidity risk.

3. Credit risk

Credit risk arises because a counterparty may fail to meet its obligations in accordance with the agreed contractual terms and conditions.

The Bank manages credit risk within a framework and policies set by the Board of Directors and Management. These are complemented by more detailed guidelines and procedures at the level of the independent risk control function.

A. Credit risk assessment

Credit risk is continuously controlled at both a counterparty and an aggregated level. As part of the independent risk control function, individual counterparty credit assessments are performed subject to a well defined internal rating process, involving 18 rating grades. As part of this process, counterparty financial statements and market information are analysed. The rating methodologies depend on the nature of the counterparty. Based on the internal rating and specific counterparty features, the Bank sets a series of credit limits covering individual counterparties and countries. Internal ratings are assigned to all counterparties. In principle, the ratings and related limits are reviewed at least annually. The main assessment criterion in these reviews is the ability of the counterparties to meet interest and principal repayment obligations in a timely manner.

Credit risk limits at the counterparty level are approved by the Bank's Management and fit within a framework set by the Board of Directors.

On an aggregated level credit risk, including default and country transfer risk, is measured, monitored and limited based on the Bank's economic capital calculation for credit risk. To calculate economic capital for credit risk, the Bank uses a portfolio VaR model. Management limits the Bank's overall exposure to credit risk by allocating an amount of economic capital to credit risk.

B. Credit risk mitigation

Credit risk is mitigated through the use of collateral and legally enforceable netting or setoff agreements. The corresponding assets and liabilities are not offset on the balance sheet.

The Bank obtains collateral, under reverse repurchase agreements, some derivative financial instrument contracts and certain drawn-down facility agreements, to mitigate counterparty default risk in accordance with the respective policies and procedures. The collateral value is monitored on an ongoing basis and, where appropriate, additional collateral is requested.

The Bank mitigates settlement risk by using established clearing centres and by settling transactions where possible through a delivery versus payment settlement mechanism. Daily settlement risk limits are monitored on a continuous basis.

C. Default risk

The exposures set out in the table below are based on the carrying value of the assets on the balance sheet as categorised by sector, geographical region and credit quality. Gold and gold loans exclude gold held in custody, and accounts receivable do not include unsettled liability issues, because these items do not represent credit exposures of the Bank. The carrying value is the fair value of the financial instruments, including derivatives, except in the case of very short-term financial instruments (sight and notice accounts) and gold, which are shown at amortised cost net of any impairment charge. Commitments are shown at their notional amounts.

Default risk by asset class and issuer type

The following tables do not take into account any collateral held or other credit enhancements available to the Bank.

As at 31 March 2009 *SDR millions*	Sovereign and central banks	Public sector	Banks	Corporate	Securitisation	Total
On-balance sheet						
Cash and sight accounts with banks	884.6	–	9.5	21.1	–	915.2
Gold and gold loans	–	–	2,672.1	138.3	–	2,810.4
Treasury bills	96,421.9	–	–	–	–	96,421.9
Securities purchased under resale agreements	4,691.5	–	32,970.0	932.9	–	38,594.4
Loans and advances	7,542.6	502.0	10,468.1	–	–	18,512.7
Government and other securities	20,437.1	11,889.9	19,161.3	1,849.3	2,426.1	55,763.7
Derivatives	102.0	49.9	13,597.2	–	–	13,749.1
Accounts receivable	–	–	722.5	11.0	–	733.5
Total on-balance sheet exposure	**130,079.7**	**12,441.8**	**79,600.7**	**2,952.6**	**2,426.1**	**227,500.9**
Commitments						
Undrawn unsecured facilities	234.5	–	–	–	–	234.5
Undrawn secured facilities	8,412.3	–	–	–	–	8,412.3
Total commitments	**8,646.8**	**–**	**–**	**–**	**–**	**8,646.8**
Total exposure	**138,726.5**	**12,441.8**	**79,600.7**	**2,952.6**	**2,426.1**	**236,147.7**

As at 31 March 2008 *SDR millions*	Sovereign and central banks	Public sector	Banks	Corporate	Securitisation	Total
On-balance sheet						
Cash	22.4	–	14.4	–	–	36.8
Gold and gold loans	–	–	3,805.2	232.9	–	4,038.1
Treasury bills	50,736.9	–	–	–	–	50,736.9
Securities purchased under resale agreements	3,272.4	–	82,191.0	6,421.2	–	91,884.6
Loans and advances	8,662.2	1,598.7	51,835.0	–	–	62,095.9
Government and other securities	18,616.3	9,963.5	27,351.5	2,695.0	3,292.2	61,918.5
Derivatives	1,006.3	1.5	6,418.6	–	–	7,426.4
Accounts receivable	–	–	424.7	10.7	–	435.4
Total on-balance sheet exposure	82,316.5	11,563.7	172,040.4	9,359.8	3,292.2	278,572.6
Commitments						
Undrawn unsecured facilities	304.6	–	–	–	–	304.6
Undrawn secured facilities	6,463.1	–	–	–	–	6,463.1
Total commitments	6,767.7	–	–	–	–	6,767.7
Total exposure	89,084.2	11,563.7	172,040.4	9,359.8	3,292.2	285,340.3

The vast majority of the Bank's assets are invested in securities issued by G10 governments and financial institutions rated A– or above by at least one of the major external credit assessment institutions. Limitations on the number of high-quality counterparties in these sectors mean that the Bank is exposed to single-name concentration risk.

Default risk by geographical region

The following tables do not take into account any collateral held or other credit enhancements available to the Bank.

As at 31 March 2009

SDR millions	Africa and Europe	Asia-Pacific	Americas	International institutions	Total
On-balance sheet					
Cash and sight accounts with banks	882.9	0.4	31.9	–	915.2
Gold and gold loans	2,087.9	345.1	377.4	–	2,810.4
Treasury bills	45,541.2	43,128.2	7,752.5	–	96,421.9
Securities purchased under resale agreements	33,522.9	4,273.9	797.6	–	38,594.4
Loans and advances	13,573.1	2,417.3	2,278.7	243.6	18,512.7
Government and other securities	32,430.8	5,750.7	11,008.1	6,574.1	55,763.7
Derivatives	9,835.8	185.4	3,727.9	–	13,749.1
Accounts receivable	232.5	119.0	382.0	–	733.5
Total on-balance sheet exposure	**138,107.1**	**56,220.0**	**26,356.1**	**6,817.7**	**227,500.9**
Commitments					
Undrawn unsecured facilities	33.5	201.0	–	–	234.5
Undrawn secured facilities	1,039.8	7,372.5	–	–	8,412.3
Total commitments	**1,073.3**	**7,573.5**	**–**	**–**	**8,646.8**
Total exposure	**139,180.4**	**63,793.5**	**26,356.1**	**6,817.7**	**236,147.7**

As at 31 March 2008

SDR millions	Africa and Europe	Asia-Pacific	Americas	International institutions	Total
On-balance sheet					
Cash	25.6	1.2	10.0	–	36.8
Gold and gold loans	1,891.4	116.4	2,030.3	–	4,038.1
Treasury bills	12,931.6	37,777.2	28.1	–	50,736.9
Securities purchased under resale agreements	89,251.3	–	2,633.3	–	91,884.6
Loans and advances	49,740.0	2,463.3	8,966.9	925.7	62,095.9
Government and other securities	36,722.9	7,740.3	11,882.7	5,572.6	61,918.5
Derivatives	6,111.1	88.8	1,225.0	1.5	7,426.4
Accounts receivable	38.3	–	397.1	–	435.4
Total on-balance sheet exposure	196,712.2	48,187.2	27,173.4	6,499.8	278,572.6
Commitments					
Undrawn unsecured facilities	304.6	–	–	–	304.6
Undrawn secured facilities	192.0	6,110.1	161.0	–	6,463.1
Total commitments	496.6	6,110.1	161.0	–	6,767.7
Total exposure	197,208.8	54,297.3	27,334.4	6,499.8	285,340.3

The Bank has allocated exposures to regions based on the country of incorporation of each legal entity.

Default risk per class of financial asset

The following tables do not take into account any collateral held or other credit enhancements available to the Bank.

As at 31 March 2009 *SDR millions*	AAA	AA	A	BBB	BB and below	Unrated	Fair value totals
On-balance sheet exposures							
Cash and sight accounts with banks	883.3	4.6	5.8	0.4	–	21.1	915.2
Gold and gold loans	–	685.9	1,986.2	138.3	–	–	2,810.4
Treasury bills	38,974.5	48,490.5	8,956.9	–	–	–	96,421.9
Securities purchased under resale agreements	328.6	18,359.8	19,816.9	89.1	–	–	38,594.4
Loans and advances	4,482.1	3,403.7	7,322.8	167.5	3,136.6	–	18,512.7
Government and other securities	32,972.5	13,715.2	8,988.2	87.8	–	–	55,763.7
Derivatives	383.8	1,999.4	11,268.0	–	97.9	–	13,749.1
Accounts receivable	397.7	–	221.5	103.3	–	11.0	733.5
Total on-balance sheet exposures	**78,422.5**	**86,659.1**	**58,566.3**	**586.4**	**3,234.5**	**32.1**	**227,500.9**
Percentages	*34.5%*	*38.1%*	*25.8%*	*0.2%*	*1.4%*	–	*100%*
Commitments							
Unsecured	–	–	–	234.5	–	–	234.5
Secured	–	2,432.9	4,178.5	1,572.3	228.6	–	8,412.3
Total commitments	**–**	**2,432.9**	**4,178.5**	**1,806.8**	**228.6**	**–**	**8,646.8**
Total exposure	**78,422.5**	**89,092.0**	**62,744.8**	**2,393.2**	**3,463.1**	**32.1**	**236,147.7**

As at 31 March 2008 *SDR millions*	AAA	AA	A	BBB	BB and below	Unrated	Fair value totals
On-balance sheet exposures							
Cash and sight accounts with banks	22.7	12.0	1.6	0.5	–	–	36.8
Gold and gold loans	–	3,123.2	914.9	–	–	–	4,038.1
Treasury bills	9,878.9	38,735.2	2,122.8	–	–	–	50,736.9
Securities purchased under resale agreements	182.7	71,573.5	20,128.4	–	–	–	91,884.6
Loans and advances	8,843.2	31,847.6	20,348.5	–	1,056.6	–	62,095.9
Government and other securities	25,990.6	26,135.8	9,754.8	37.3	–	–	61,918.5
Derivatives	994.0	5,291.3	1,096.1	11.2	33.8	–	7,426.4
Accounts receivable	397.1	4.8	22.8	–	–	10.7	435.4
Total on-balance sheet exposures	46,309.2	176,723.4	54,389.9	49.0	1,090.4	10.7	278,572.6
Percentages	*16.6%*	*63.5%*	*19.5%*	–	*0.4%*	–	*100%*
Commitments							
Unsecured	304.6	–	–	–	–	–	304.6
Secured	180.0	531.0	4,087.1	713.0	952.0	–	6,463.1
Total commitments	484.6	531.0	4,087.1	713.0	952.0	–	6,767.7
Total exposure	46,793.8	177,254.4	58,477.0	762.0	2,042.4	10.7	285,340.3

The ratings shown reflect the Bank's internal ratings expressed as equivalent external ratings. The vast majority of the Bank's exposure is rated equivalent to A– or above.

A financial asset is considered past due when a counterparty fails to make a payment on the contractual due date. The Bank revalues virtually all of its financial assets to fair value on a daily basis and reviews its valuations monthly, taking into account necessary adjustments for impairment. As at 31 March 2009 the Bank recorded an impairment charge of SDR 18.3 million on gold loans (2008: nil). No financial assets were considered past due at the balance sheet date.

D. Credit risk mitigation and collateral

As at 31 March	2009		2008	
SDR millions	Fair value of relevant contracts	Value of collateral	Fair value of relevant contracts	Value of collateral
Collateral obtained for				
Securities purchased under resale agreements	33,625.0	33,725.5	69,965.9	70,245.5
Advances	3,136.5	5,013.4	1,057.0	2,436.8
Derivatives	4,957.3	4,542.4	2,979.3	2,429.7
Total collateral obtained	**41,718.8**	**43,281.3**	74,002.2	75,112.0
Collateral provided for				
Securities sold under repurchase agreements	–	–	1,894.1	1,898.2
Total collateral provided	–	–	1,894.1	1,898.2

The above table shows the collateral obtained and provided by the Bank. It excludes transactions which have yet to settle (on which neither cash nor collateral have been exchanged). The Bank obtains collateral as part of reverse repurchase agreements and collateral agreements for certain derivatives. The Bank is allowed to sell or repledge this collateral, but must deliver equivalent financial instruments upon the expiry of the contract. Eligible collateral for reverse repurchase agreements comprises sovereign and supranational debt as well as US agency securities. Eligible collateral for derivatives comprises sovereign securities. Due to the default of a counterparty SDR 735.5 million of US Treasury bills held as collateral was seized and sold during the financial year ended 31 March 2009.

The Bank grants facilities to customers which are secured against either deposits made with the Bank or units held by customers in funds managed by the Bank. As at 31 March 2009 the total amount of undrawn facilities which could be drawn down subject to collateralisation by the customer was SDR 8,412.3 million (2008: SDR 6,463.1 million).

The Bank provides collateral for securities sold under repurchase agreements. This collateral consists of government or agency securities.

E. Economic capital for credit risk

The Bank determines economic capital for credit risk using a VaR methodology on the basis of a portfolio VaR model, assuming a one-year time horizon and a 99.995% confidence interval. The table below shows the key figures of the Bank's exposure to credit risk in terms of economic capital utilisation over the past two financial years.

For the financial year ended 31 March	2009				2008			
SDR millions	Average	High	Low	At 31 March	Average	High	Low	At 31 March
Economic capital utilisation for credit risk	6,080.1	6,596.3	5,389.1	**5,673.7**	6,427.3	6,841.1	5,967.4	6,173.3

F. Minimum capital requirements for credit risk

Exposures to sovereigns, banks and corporates

For the calculation of risk-weighted assets for exposures to banks, sovereigns and corporates, the Bank has adopted an approach that is consistent with the advanced internal ratings-based approach for the majority of its exposures.

As a general rule, under this approach risk-weighted assets are determined by multiplying the credit risk exposures with risk weights derived from the relevant Basel II risk weight function using the Bank's own estimates for key inputs. These estimates for key inputs are also relevant to the Bank's economic capital calculation for credit risk.

The credit risk exposure for a transaction or position is referred to as the exposure at default (EAD). The Bank determines the EAD as the notional amount of all on- and off-balance sheet credit exposures, except derivatives. The EAD for derivatives is calculated using an approach consistent with the internal models method proposed under the Basel II Framework. In line with this methodology, the Bank calculates effective expected positive exposures that are then multiplied by a factor alpha as set out in the Framework.

Key inputs to the risk weight function are a counterparty's estimated one-year probability of default (PD) as well as the estimated loss-given-default (LGD) and maturity for each transaction.

Due to the high credit quality of the Bank's investments and the conservative credit risk management process at the BIS, the Bank is not in a position to estimate PDs and LGDs based on its own default experience. The Bank calibrates counterparty PD estimates through a mapping of internal rating grades to external credit assessments taking external default data into account. Similarly, LGD estimates are derived from external data. Where appropriate, these estimates are adjusted to reflect the risk-reducing effect of collateral obtained giving consideration to market price volatility, remargining and revaluation frequency.

The table below details the calculation of risk-weighted assets. The exposures are measured taking netting and collateral benefits into account. The total amount of exposures reported in the table as at 31 March 2009 includes SDR 7,024.8 million (2008: SDR 5,998.3 million) for interest rate contracts and SDR 5,108.0 million (2008: SDR 2,823.1 million) for FX and gold contracts.

As at 31 March 2009

Internal rating grades expressed as equivalent external rating grades	Amount of exposure	Exposure-weighted PD	Exposure-weighted average LGD	Exposure-weighted average risk weight	Risk-weighted assets
Percentages / SDR millions	*SDR millions*	*%*	*%*	*%*	*SDR millions*
AAA	73,642.3	0.005	30.8	2.4	1,803.0
AA	86,205.5	0.02	25.3	3.6	3,109.3
A	59,283.3	0.05	23.9	6.9	4,119.8
BBB	3,848.8	0.62	11.8	11.0	425.3
BB and below	2,037.8	11.34	7.7	32.3	657.4
Total	**225,017.7**				**10,114.8**

During the reporting period the Bank experienced a credit loss due to a default. Taking account of the collateral held in relation to the transactions, the Bank recorded a net loss of SDR 4.6 million.

As at 31 March 2008

Internal rating grades expressed as equivalent external rating grades	Amount of exposure	Exposure-weighted PD	Exposure-weighted average LGD	Exposure-weighted average risk weight	Risk-weighted assets
Percentages / SDR millions	*SDR millions*	*%*	*%*	*%*	*SDR millions*
AAA	42,393.0	0.007	34.0	3.3	1,417.7
AA	178,155.6	0.03	22.2	3.5	6,201.3
A	58,280.9	0.05	25.4	6.2	3,631.3
BBB	947.2	0.22	11.1	7.3	68.8
BB and below	1,783.5	10.04	5.2	22.2	396.1
Total	281,560.2				11,715.2

G. Securitisation exposures

The Bank only invests in highly rated securitisation exposures based on traditional, ie non-synthetic, securitisation structures. Risk-weighted assets for these exposures are determined using the standardised approach.

Given the scope of the Bank's activities, risk-weighted assets under the Basel II Framework are determined according to the standardised approach for securitisation. Under this approach, external credit assessments of the securities are used to determine the relevant risk weights. External credit assessment institutions used for this purpose are Moody's Investors Service, Standard & Poor's and Fitch Ratings. Risk-weighted assets are then derived as the product of the notional amounts of the exposures and the associated risk weights.

The following table shows the Bank's investments in securitisation analysed by type of securitised assets:

As at 31 March 2009

SDR millions	External rating	Amount of exposures	Risk weight	Risk-weighted assets
Residential mortgage-backed securities	AAA	649.3	20%	129.9
Securities backed by credit card receivables	AAA	1,176.8	20%	235.3
Securities backed by other receivables (government-sponsored)	AAA	737.9	20%	147.6
Total		**2,564.0**		**512.8**

As at 31 March 2008

SDR millions	External rating	Amount of exposures	Risk weight	Risk-weighted assets
Asset-backed commercial paper	A1/P1/F1+	168.7	20%	33.7
Residential mortgage-backed securities	AAA	1,344.2	20%	268.9
Securities backed by credit card receivables	AAA	1,111.0	20%	222.2
Securities backed by other receivables (government-sponsored)	AAA	750.1	20%	150.0
Total		3,374.0		674.8

4. Market risk

The Bank is exposed to market risk through adverse movements in market prices. The main components of the Bank's market risk are gold price risk, interest rate risk and foreign exchange risk. The Bank measures market risk and calculates economic capital based on a VaR methodology using a Monte Carlo simulation technique. Risk factor volatilities and correlations are estimated using a one-year observation period. Furthermore, the Bank computes sensitivities to certain market risk factors.

In line with the Bank's objective to maintain its superior credit quality, economic capital is measured at the 99.995% confidence interval assuming a one-year holding period. The Bank's Management manages market risk economic capital usage within a framework set by the Board of Directors. VaR limits are supplemented by operating limits.

VaR models depend on statistical assumptions and the quality of available market data and, while forward-looking, they extrapolate from past events.

To ensure that models provide a reliable measure of potential losses over the one-year time horizon, the Bank has established a comprehensive regular backtesting framework, comparing daily performance with corresponding VaR estimates. The results are analysed and reported to Management.

The Bank also supplements its market risk measurement based on VaR modelling and related economic capital calculations with a series of stress tests. These include severe historical scenarios, adverse hypothetical macroeconomic scenarios and sensitivity tests of gold price, interest rate and foreign exchange rate movements.

A. Gold price risk

Gold price risk is the exposure of the Bank's financial condition to adverse movements in the price of gold.

The Bank is exposed to gold price risk principally through its holdings of gold investment assets, which amount to 120 tonnes (2008: 125 tonnes). These gold investment assets are held in custody or placed on deposit with commercial banks. At 31 March 2009 the Bank's gold position was SDR 2,358.0 million (2008: SDR 2,247.0 million), approximately 17% of its equity (2008: 17%). The Bank sometimes also has small exposures to gold price risk emerging from its banking activities with central and commercial banks. Gold price risk is measured within the Bank's VaR methodology, including its economic capital framework and stress tests.

B. Interest rate risk

Interest rate risk is the exposure of the Bank's financial condition to adverse movements in interest rates including credit spreads.

The Bank is exposed to interest rate risk through the interest bearing assets relating to the management of its equity held in its investment portfolios and investments relating to its banking portfolios. The investment portfolios are managed with a fixed duration benchmark of bonds.

The Bank measures and monitors interest rate risk using a VaR methodology and sensitivity analyses taking into account movements in relevant money market rates, government bonds, swap rates and credit spreads.

The tables below show the impact on the Bank's equity of a 1% upward shift in the relevant yield curve per time band:

As at 31 March 2009

SDR millions	Up to 6 months	6 to 12 months	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	Over 5 years
Euro	(5.4)	(5.5)	(11.9)	(16.5)	(24.0)	(15.1)	(13.9)
Japanese yen	1.0	(1.3)	(6.6)	(11.3)	(14.6)	(5.1)	(1.7)
Pound sterling	0.2	(1.3)	(3.6)	(12.9)	(8.7)	(1.7)	(1.9)
Swiss franc	(0.1)	(0.2)	(0.6)	(0.6)	(0.7)	(1.4)	2.7
US dollar	(0.6)	(7.6)	(41.5)	(13.8)	(29.1)	(22.6)	(29.3)
Other currencies	(0.1)	(6.0)	(1.2)	(10.8)	(0.8)	–	–
Total	**(5.0)**	**(21.9)**	**(65.4)**	**(65.9)**	**(77.9)**	**(45.9)**	**(44.1)**

As at 31 March 2008

SDR millions	Up to 6 months	6 to 12 months	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	Over 5 years
Euro	(5.8)	(3.4)	(26.9)	(16.6)	(17.3)	(31.7)	(61.4)
Japanese yen	0.1	(0.9)	(4.8)	(7.7)	(7.5)	(4.4)	(19.9)
Pound sterling	3.9	(3.8)	(4.6)	(5.8)	(5.8)	(6.9)	(23.3)
Swiss franc	(0.6)	0.1	(0.6)	(0.5)	(0.5)	(1.0)	2.2
US dollar	(2.6)	(15.0)	(23.9)	(12.4)	(16.3)	(26.1)	(72.7)
Other currencies	(1.7)	(6.0)	(8.2)	(2.9)	(13.3)	(1.1)	–
Total	(6.7)	(29.0)	(69.0)	(45.9)	(60.7)	(71.2)	(175.1)

C. Foreign exchange risk

The Bank's functional currency, the SDR, is a composite currency comprising fixed amounts of USD, EUR, JPY and GBP. Currency risk is the exposure of the Bank's financial condition to adverse movements in exchange rates. The Bank is exposed to foreign exchange risk primarily through the assets relating to the management of its equity. The Bank is also exposed to foreign exchange risk through managing its customer deposits and through acting as an intermediary in foreign exchange transactions between central and commercial banks. The Bank reduces its foreign exchange exposures by matching the relevant assets to the constituent currencies of the SDR on a regular basis, and by limiting currency exposures arising from customer deposits and foreign exchange transaction intermediation.

Foreign exchange risk is measured and monitored based on the Bank's VaR methodology and sensitivity analyses considering movements in key foreign exchange rates.

The following tables show the Bank's assets and liabilities by currency and gold exposure. The net foreign exchange and gold position in these tables therefore includes the Bank's gold investments. To determine the Bank's net foreign exchange exposure, the gold amounts need to be removed. The SDR neutral position is then deducted from the net foreign exchange position excluding gold to arrive at the net currency exposure of the Bank on an SDR neutral basis.

As at 31 March 2009 *SDR millions*	SDR	USD	EUR	GBP	JPY	CHF	Gold	Other currencies	Total
Assets									
Cash and sight accounts with banks	–	28.9	175.2	6.4	–	696.2	–	8.5	915.2
Gold and gold loans	–	19.1	–	–	–	–	25,397.1	–	25,416.2
Treasury bills	–	7,752.5	43,738.8	1,802.4	43,128.2	–	–	–	96,421.9
Securities purchased under resale agreements	–	797.6	27,986.9	5,536.0	4,273.9	–	–	–	38,594.4
Loans and advances	243.7	8,999.5	7,619.1	1,077.5	4.0	443.5	–	125.4	18,512.7
Government and other securities	–	27,233.4	22,706.3	2,704.9	1,437.8	30.6	–	1,650.7	55,763.7
Derivative financial instruments	21.0	65,576.9	(12,368.7)	370.2	(41,023.4)	191.4	–	981.7	13,749.1
Accounts receivable	0.1	3,719.7	959.8	988.6	110.1	11.1	–	33.1	5,822.5
Land, buildings and equipment	183.1	–	–	–	–	7.9	–	–	191.0
Total	**447.9**	**114,127.6**	**90,817.4**	**12,486.0**	**7,930.6**	**1,380.7**	**25,397.1**	**2,799.4**	**255,386.7**
Liabilities									
Currency deposits	(2,015.5)	(134,278.9)	(41,524.2)	(11,597.5)	(3,935.6)	(1,220.8)	–	(2,649.7)	(197,222.2)
Gold deposits	–	(13.0)	–	–	–	–	(23,039.1)	–	(23,052.1)
Derivative financial instruments	2.2	26,485.3	(34,192.0)	2,970.0	(1,846.9)	(144.5)	–	(90.9)	(6,816.8)
Accounts payable	–	(532.0)	(10,482.5)	(2,662.2)	(442.3)	–	–	(92.5)	(14,211.5)
Other liabilities	–	(153.3)	(0.4)	–	–	(214.5)	–	–	(368.2)
Total	**(2,013.3)**	**(108,491.9)**	**(86,199.1)**	**(11,289.7)**	**(6,224.8)**	**(1,579.8)**	**(23,039.1)**	**(2,833.1)**	**(241,670.8)**
Net currency and gold position	**(1,565.4)**	**5,635.7**	**4,618.3**	**1,196.3**	**1,705.8**	**(199.1)**	**2,358.0**	**(33.7)**	**13,715.9**
Adjustment for gold investment assets	–	–	–	–	–	–	(2,358.0)	–	(2,358.0)
Net currency position	**(1,565.4)**	**5,635.7**	**4,618.3**	**1,196.3**	**1,705.8**	**(199.1)**	**–**	**(33.7)**	**11,357.9**
SDR neutral position	1,565.4	(5,472.6)	(4,718.3)	(1,122.7)	(1,609.7)	–	–	–	(11,357.9)
Net currency exposure on SDR neutral basis	**–**	**163.1**	**(100.0)**	**73.6**	**96.1**	**(199.1)**	**–**	**(33.7)**	**–**

As at 31 March 2008 *SDR millions*	SDR	USD	EUR	GBP	JPY	CHF	Gold	Other currencies	Total
Assets									
Cash and sight accounts with banks	–	9.3	14.5	2.1	–	4.7	–	6.2	36.8
Gold and gold loans	–	17.2	–	–	–	–	31,520.5	–	31,537.7
Treasury bills	–	28.1	12,931.5	–	37,777.3	–	–	–	50,736.9
Securities purchased under resale agreements	–	1,823.5	79,059.5	7,911.8	3,089.8	–	–	–	91,884.6
Loans and advances	669.8	45,677.1	4,565.0	9,250.4	182.7	972.1	–	778.8	62,095.9
Government and other securities	–	29,690.6	22,395.8	4,195.1	1,472.5	62.4	–	4,102.1	61,918.5
Derivative financial instruments	51.5	1,856.5	3,259.7	(4,233.2)	4,943.8	7.7	(56.9)	1,597.3	7,426.4
Accounts receivable	–	4,400.1	35.8	710.5	24.4	7.4	–	133.6	5,311.8
Land, buildings and equipment	190.4	–	–	–	–	–	–	–	190.4
Total	911.7	83,502.4	122,261.8	17,836.7	47,490.5	1,054.3	31,463.6	6,618.0	311,139.0
Liabilities									
Currency deposits	(2,238.8)	(157,367.2)	(45,777.9)	(17,837.7)	(3,601.3)	(987.0)	–	(8,311.0)	(236,120.9)
Gold deposits	–	(8.9)	–	–	–	–	(29,092.5)	–	(29,101.4)
Securities sold under repurchase agreements	–	(1,489.1)	–	(405.0)	–	–	–	–	(1,894.1)
Derivative financial instruments	20.1	82,381.9	(49,622.9)	1,893.1	(42,503.9)	(56.9)	(124.1)	1,785.0	(6,227.7)
Accounts payable	–	(2,094.5)	(22,011.4)	(146.9)	–	–	–	(112.6)	(24,365.4)
Other liabilities	–	(117.2)	(0.5)	–	–	(208.8)	–	–	(326.5)
Total	(2,218.7)	(78,695.0)	(117,412.7)	(16,496.5)	(46,105.2)	(1,252.7)	(29,216.6)	(6,638.6)	(298,036.0)
Net currency and gold position	(1,307.0)	4,807.4	4,849.1	1,340.2	1,385.3	(198.4)	2,247.0	(20.6)	13,103.0
Adjustment for gold investment assets	–	–	–	–	–	–	(2,247.0)	–	(2,247.0)
Net currency position	(1,307.0)	4,807.4	4,849.1	1,340.2	1,385.3	(198.4)	–	(20.6)	10,856.0
SDR neutral position	1,307.0	(4,683.0)	(4,788.5)	(1,327.0)	(1,364.5)	–	–	–	(10,856.0)
Net currency exposure on SDR neutral basis	–	124.4	60.6	13.2	20.8	(198.4)	–	(20.6)	–

D. Economic capital for market risk

The Bank measures market risk based on a VaR methodology using a Monte Carlo simulation technique taking correlations between risk factors into account. Economic capital for market risk is also calculated following this methodology measured to the 99.995% confidence interval and assuming a one-year holding period. The Bank measures its gold price risk relative to changes in the USD value of gold. The foreign exchange risk component, resulting from changes in the USD exchange rate versus the SDR, is included in the measurement of foreign exchange risk. The table below shows the key figures of the Bank's exposure to market risk in terms of economic capital utilisation over the past two financial years.

For the financial year ended 31 March

	2009				2008			
SDR millions	Average	High	Low	At 31 March	Average	High	Low	At 31 March
Economic capital utilisation for market risk	2,614.0	3,386.9	1,928.0	**3,099.8**	1,755.5	2,950.0	1,179.5	2,689.7

The table below provides a further analysis of the Bank's market risk exposure by category of risk.

For the financial year ended 31 March

	2009				2008			
SDR millions	Average	High	Low	At 31 March	Average	High	Low	At 31 March
Gold price risk	1,690.5	2,325.1	1,312.6	**2,009.1**	1,399.7	2,163.9	958.1	2,116.1
Interest rate risk	1,972.7	2,519.9	1,404.8	**2,209.1**	1,294.4	2,200.6	623.4	2,187.0
Foreign exchange risk	502.7	769.0	301.6	**769.0**	289.0	574.0	169.9	519.3
Correlation and diversification effects	(1,551.9)	(2,073.7)	(1,164.2)	**(1,887.4)**	(1,227.6)	(2,137.4)	(646.7)	(2,132.7)

E. Minimum capital requirements for market risk

For the calculation of minimum capital requirements for market risk under the Basel II Framework, the Bank has adopted a banking book approach consistent with the scope and nature of its business activities. Consequently, market risk-weighted assets are determined for gold price risk and foreign exchange risk, but not interest rate risk. The related minimum capital requirement is derived using the VaR-based internal models method. Under this method, VaR calculations are performed using the Bank's VaR methodology, assuming a 99% confidence interval, a 10-day holding period and a one-year historical observation period.

The actual minimum capital requirement is derived as the higher of the VaR on the calculation date and the average of the daily VaR measures on each of the preceding 60 business days (including the calculation date) subject to a multiplication factor of three plus a potential add-on depending on backtesting results. For the period under consideration, the number of backtesting outliers observed remained within the range where no add-on is required. The table below summarises the market risk development relevant to the calculation of minimum capital requirements over the reporting period and shows the Bank's minimum capital requirement for market risk and the related risk-weighted assets as at 31 March 2009.

As at 31 March	**2009**			2008		
SDR millions	VaR	Risk-weighted assets (A)	Minimum capital requirement (B)	VaR	Risk-weighted assets (A)	Minimum capital requirement (B)
Market risk, where (A) is derived as (B) / 8%	420.9	15,783.5	**1,262.7**	218.6	8,197.5	655.8

5. Liquidity risk

Liquidity risk arises when the Bank may not be able to meet expected or unexpected current or future cash flows and collateral needs without affecting its daily operations or its financial condition.

Outstanding balances in the currency and gold deposits from central banks, international organisations and other public institutions are the key drivers of the size of the Bank's balance sheet. The Bank has undertaken to repurchase at fair value certain of its currency deposit instruments at one or two business days' notice. The Bank is managed to preserve a high degree of liquidity so that it can meet the requirements of its customers at all times.

The Bank has developed a liquidity management framework based on a statistical model underpinned by conservative assumptions with regard to cash inflows and the liquidity of liabilities. Within this framework, the Board of Directors has set a limit for the Bank's liquidity ratio which requires liquid assets to be at least 100% of the potential liquidity requirement. In addition, liquidity stress tests assuming extreme withdrawal scenarios are performed. These stress tests specify additional liquidity requirements to be met by holdings of liquid assets. The Bank's liquidity has consistently been materially above its minimum liquidity ratio and the requirements of its stress tests.

The Bank's currency and gold deposits, principally from central banks and international institutions, comprise 91% (2008: 89%) of its total liabilities. At 31 March 2009 currency and gold deposits originated from 131 depositors (2008: 152). Within these deposits, there are significant individual customer concentrations, with seven customers each contributing in excess of 5% of the total on a settlement date basis (2008: four customers).

The following table shows the maturity profile of cash flows for assets and liabilities. The amounts disclosed are the undiscounted cash flows to which the Bank is committed.

As at 31 March 2009

SDR millions	Up to 1 month	1 to 3 months	3 to 6 months	6 to 12 months	1 to 2 years	2 to 5 years	5 to 10 years	Over 10 years	Total
Assets									
Cash and sight accounts with banks	915.2	–	–	–	–	–	–	–	915.2
Gold and gold loans	22,856.0	458.0	265.1	630.6	375.3	698.4	167.0	–	25,450.4
Treasury bills	17,346.9	48,193.3	15,306.8	15,178.4	–	–	–	–	96,025.4
Securities purchased under resale agreements	25,396.5	240.8	1,444.0	–	–	–	–	–	27,081.3
Loans and advances	9,533.3	7,931.7	804.1	–	–	–	–	–	18,269.1
Government and other securities	3,800.4	7,106.2	3,880.8	4,934.0	12,920.3	17,782.8	9,247.2	921.8	60,593.5
Total	**79,848.3**	**63,930.0**	**21,700.8**	**20,743.0**	**13,295.6**	**18,481.2**	**9,414.2**	**921.8**	**228,334.9**
Liabilities									
Currency deposits									
Deposit instruments repayable at 1–2 days' notice	(11,144.1)	(19,693.4)	(15,143.3)	(20,590.2)	(18,218.1)	(29,301.2)	(7,309.7)	–	(121,400.0)
Other currency deposits	(68,805.4)	(4,635.1)	(1,348.5)	(22.6)	–	–	–	–	(74,811.6)
Gold deposits	(21,768.0)	(200.1)	(216.8)	(296.7)	(195.7)	(216.3)	(165.4)	–	(23,059.0)
Securities sold short	(0.8)	(1.7)	(2.5)	(4.9)	(9.8)	(29.7)	(49.9)	(185.4)	(284.7)
Total	**(101,718.3)**	**(24,530.3)**	**(16,711.1)**	**(20,914.4)**	**(18,423.6)**	**(29,547.2)**	**(7,525.0)**	**(185.4)**	**(219,555.3)**
Derivatives									
Net settled									
Interest rate contracts	(1,304.0)	588.3	940.4	1,049.2	1,483.8	1,486.7	187.4	0.1	4,431.9
Gross settled									
Exchange rate and gold price contracts									
Inflows	29,504.3	53,304.7	8,576.4	10,940.4	–	–	–	–	102,325.8
Outflows	(28,771.1)	(52,297.6)	(8,568.4)	(11,221.9)	–	–	–	–	(100,859.0)
Subtotal	733.2	1,007.1	8.0	(281.5)	–	–	–	–	1,466.8
Interest rate contracts – gross settled									
Inflows	2.8	53.4	320.9	164.5	610.2	665.5	841.1	–	2,658.4
Outflows	(2.1)	(67.1)	(339.2)	(197.2)	(695.6)	(747.4)	(920.3)	–	(2,968.9)
Subtotal	0.7	(13.7)	(18.3)	(32.7)	(85.4)	(81.9)	(79.2)	–	(310.5)
Total derivatives	**(570.1)**	**1,581.7**	**930.1**	**735.0**	**1,398.4**	**1,404.8**	**108.2**	**0.1**	**5,588.2**
Total future undiscounted cash flows	**(22,440.1)**	**40,981.4**	**5,919.8**	**563.6**	**(3,729.6)**	**(9,661.2)**	**1,997.4**	**736.5**	**14,367.8**

As at 31 March 2008

SDR millions	Up to 1 month	1 to 3 months	3 to 6 months	6 to 12 months	1 to 2 years	2 to 5 years	5 to 10 years	Over 10 years	Total
Assets									
Cash and sight accounts with banks	36.8	–	–	–	–	–	–	–	36.8
Gold and gold loans	27,836.1	215.9	379.1	558.8	1,446.3	974.8	151.6	–	31,562.6
Treasury bills	15,043.0	27,977.7	6,629.3	1,195.5	–	–	–	–	50,845.5
Securities purchased under resale agreements	53,803.9	14,279.9	2,079.3	–	–	–	–	–	70,163.1
Loans and advances	24,550.5	24,058.1	9,636.4	3,140.8	–	–	–	–	61,385.8
Government and other securities	7,940.5	8,755.7	5,245.0	6,710.1	10,340.2	15,696.2	12,543.5	923.7	68,154.9
Total	129,210.8	75,287.3	23,969.1	11,605.2	11,786.5	16,671.0	12,695.1	923.7	282,148.7
Liabilities									
Currency deposits									
Deposit instruments repayable at 1–2 days' notice	(5,757.5)	(21,501.1)	(20,601.1)	(28,243.4)	(35,374.1)	(33,370.0)	(9,928.4)	(9.3)	(154,784.9)
Other currency deposits	(56,610.6)	(16,760.6)	(7,355.6)	(3,229.8)	–	–	–	–	(83,956.6)
Gold deposits	(27,579.3)	–	(18.2)	(125.1)	(864.2)	(373.9)	(150.1)	–	(29,110.8)
Securities sold under repurchase agreements	(1,896.3)	–	–	–	–	–	–	–	(1,896.3)
Securities sold short	(11.9)	–	–	–	–	(16.2)	(12.4)	(75.1)	(115.6)
Total	(91,855.6)	(38,261.7)	(27,974.9)	(31,598.3)	(36,238.3)	(33,760.1)	(10,090.9)	(84.4)	(269,864.2)
Derivatives									
Net settled									
Interest rate contracts	(59.6)	87.8	43.6	1,711.3	1,223.9	741.4	34.4	–	3,782.8
Gross settled									
Exchange rate and gold price contracts									
Inflows	77,731.6	33,831.8	8,236.2	10,349.7	135.2	–	–	–	130,284.5
Outflows	(78,792.3)	(34,443.3)	(8,222.5)	(10,285.7)	(135.2)	–	–	–	(131,879.0)
Subtotal	(1,060.7)	(611.5)	13.7	64.0	–	–	–	–	(1,594.5)
Interest rate contracts – gross settled									
Inflows	80.6	121.1	239.3	529.6	534.6	917.6	1,034.0	–	3,456.8
Outflows	(99.8)	(157.4)	(279.4)	(673.1)	(610.6)	(1,112.6)	(1,316.8)	–	(4,249.7)
Subtotal	(19.2)	(36.3)	(40.1)	(143.5)	(76.0)	(195.0)	(282.8)	–	(792.9)
Total derivatives	(1,139.5)	(560.0)	17.2	1,631.8	1,147.9	546.4	(248.4)	–	1,395.4
Total future undiscounted cash flows	36,215.7	34,465.5	(3,988.6)	(18,361.3)	(23,303.9)	(16,542.7)	2,355.8	839.3	13,679.6

The Bank writes options in the ordinary course of its banking business. The table below discloses the fair value of the written options analysed by exercise date:

Written options

SDR millions	Up to 1 month	1 to 3 months	3 to 6 months	6 to 12 months	1 to 2 years	2 to 5 years	5 to 10 years	Over 10 years	Total
As at 31 March 2009	(1.2)	(10.2)	(8.4)	(138.2)	(1.8)	(7.9)	(4.3)	–	**(172.0)**
As at 31 March 2008	(0.9)	(11.3)	(9.7)	(94.3)	(5.3)	–	–	–	(121.5)

The table below shows the contractual expiry date of the credit commitments as at the balance sheet date:

Contractual expiry date

SDR millions	Up to 1 month	1 to 3 months	3 to 6 months	6 to 12 months	1 to 2 years	2 to 5 years	5 to 10 years	Maturity undefined	Total
As at 31 March 2009	33.5	335.0	–	6,400.1	–	–	–	1,677.1	**8,445.7**
As at 31 March 2008	243.7	466.3	–	4,212.7	–	–	–	1,845.0	6,767.7

6. Operational risk

Operational risk is defined by the Bank as the risk of financial loss, or damage to the Bank's reputation, or both, resulting from one or more risk causes, as outlined below:

- human factors: insufficient personnel, lack of requisite knowledge, skills or experience, inadequate training and development, inadequate supervision, loss of key personnel, inadequate succession planning, or lack of integrity or ethical standards;
- failed or inadequate processes: a process is poorly designed or unsuitable, or is not properly documented, understood, implemented, followed or enforced;
- failed or inadequate systems: a system is poorly designed, unsuitable or unavailable, or does not operate as intended; and
- external events: the occurrence of an event having an adverse impact on the Bank but outside its control.

Operational risk includes legal risk, but excludes strategic risk.

The Bank's operational risk management framework, policies and procedures comprise the management and measurement of operational risk, including the determination of the relevant key parameters and inputs, business continuity planning and the monitoring of key risk indicators.

The Bank has established a procedure of immediate reporting for operational risk-related incidents. The Compliance and Operational Risk Unit develops action plans with the respective units and follows up on their implementation on a regular basis.

For the measurement of operational risk economic capital and operational risk-weighted assets, the Bank has adopted a VaR approach using a Monte Carlo simulation technique that is consistent with the advanced measurement approach proposed under the Basel II Framework. In line with the assumptions of the Basel II Framework, the quantification of operational risk does not take reputational risk into account. Internal and external loss data, scenario estimates and control self-assessments to reflect changes in the business and control environment of the Bank are key inputs in the calculations. The Bank does not incorporate potential protection it may obtain from insurance in the measurement of operational risk.

A. Economic capital for operational risk

Consistent with the parameters used in the calculation of economic capital for financial risk, the Bank measures economic capital for operational risk to the 99.995% confidence interval assuming a one-year holding period. The table below shows the key figures of the Bank's exposure to operational risk in terms of economic capital utilisation over the past two financial years.

For the financial year ended 31 March

	2009				2008			
SDR millions	Average	High	Low	At 31 March	Average	High	Low	At 31 March
Economic capital utilisation for operational risk	412.5	425.0	400.0	**425.0**	370.0	400.0	360.0	400.0

B. Minimum capital requirements for operational risk

In line with the key parameters of the Basel II Framework, the calculation of the minimum capital requirement for operational risk is determined assuming a 99.9% confidence interval and a one-year time horizon. The table below summarises the key figures of the Bank's exposure to operational risk in terms of minimum capital requirements over the past two financial years.

As at 31 March	**2009**			2008		
SDR millions	VaR	Risk-weighted assets (A)	Minimum capital requirement (B)	VaR	Risk-weighted assets (A)	Minimum capital requirement (B)
Operational risk, where (A) is derived as (B) / 8%	180.0	2,250.0	**180.0**	157.0	1,962.5	157.0

Report of the auditors

to the Board of Directors and to the General Meeting
of the Bank for International Settlements, Basel

We have audited the accompanying financial statements of the Bank for International Settlements. These financial statements incorporate the balance sheet as at 31 March 2009, the profit and loss account for the year then ended as required by the Bank's Statutes, and the statement of cash flows and notes thereto. The financial statements have been prepared by the Management of the Bank in accordance with the Statutes and with the principles of valuation described under significant accounting policies in the notes. The Management of the Bank is responsible for designing, implementing and maintaining internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances. Our responsibility under the Statutes of the Bank is to form an independent opinion on the balance sheet and profit and loss account based on our audit and to report our opinion to you.

We conducted our audit in accordance with International Standards on Auditing. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risk of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements. We have received all the information and explanations which we have required to obtain assurance that the balance sheet and profit and loss account are free of material misstatement, and believe that our audit provides a reasonable basis for our opinion.

In our opinion, the financial statements, including the notes thereto, have been properly drawn up and give a true and fair view of the financial position of the Bank for International Settlements at 31 March 2009 and the results of its operations for the year then ended in conformity with the accounting principles described in the notes to the financial statements and the Statutes of the Bank.

Deloitte AG

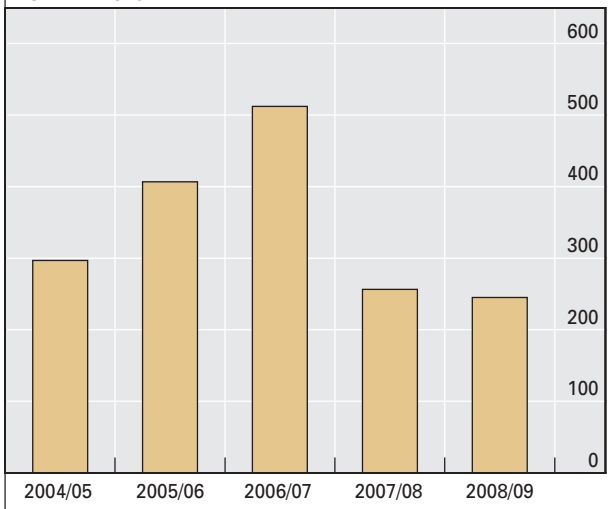
Mark D. Ward Pavel Nemecek

Zurich, 11 May 2009

Five-year graphical summary

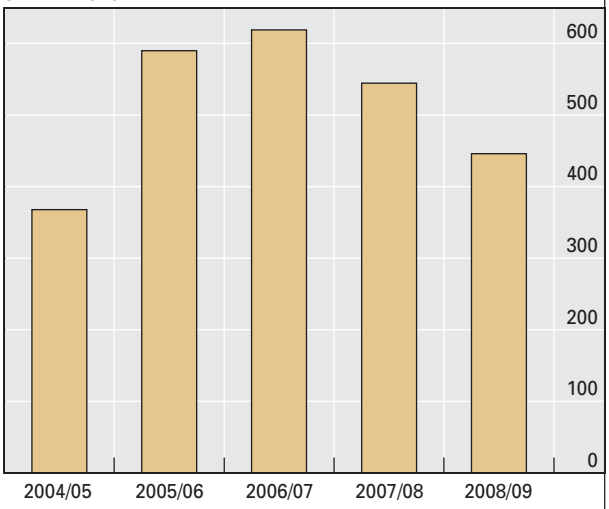
Operating profit

SDR millions



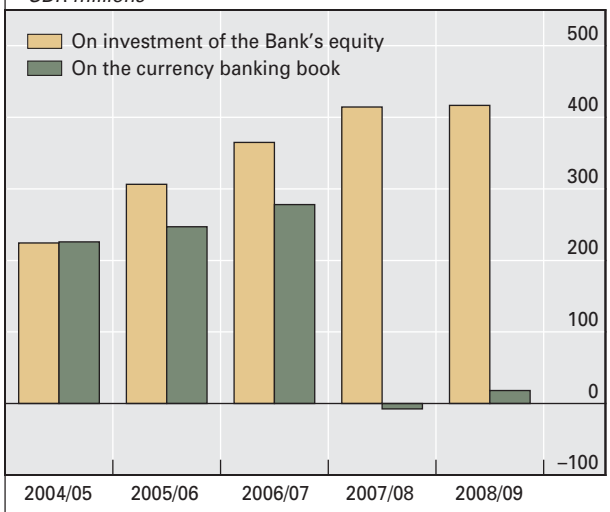
Net profit

SDR millions



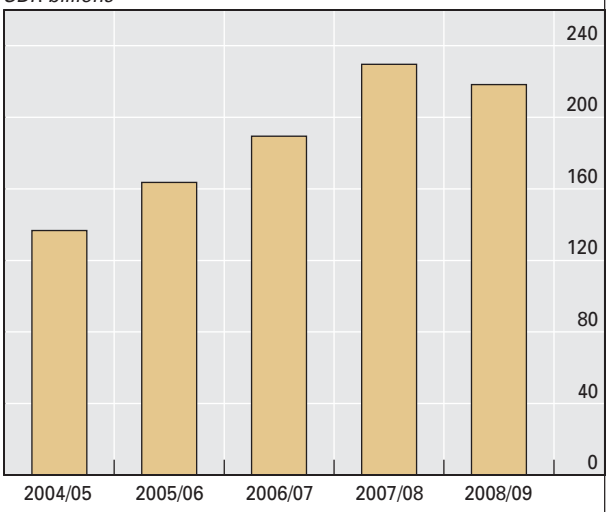
Net interest earned on currency investments

SDR millions



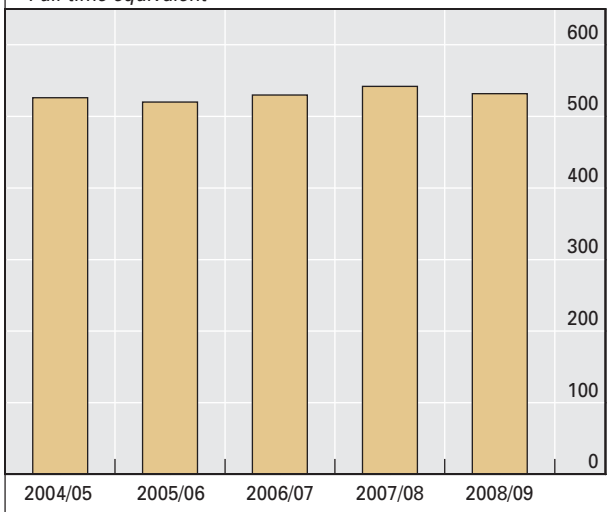
Average currency deposits (settlement date basis)

SDR billions



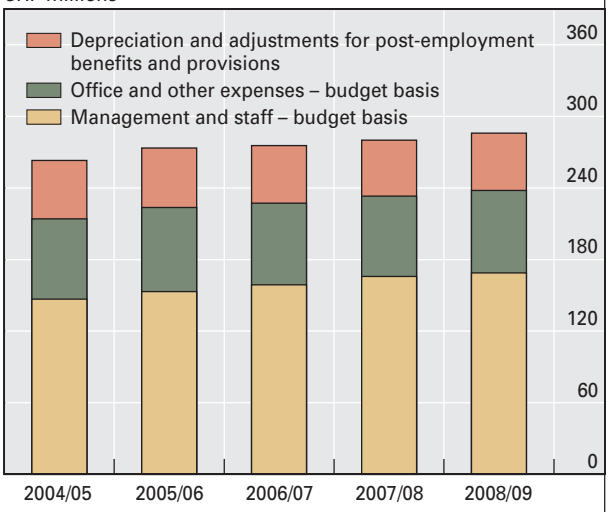
Average number of employees

Full-time equivalent



Operating expense

CHF millions



The financial information in the top four panels has been restated to reflect a change in the accounting policy made in the previous years' accounts.

Printed in Switzerland Werner Druck AG, Basel