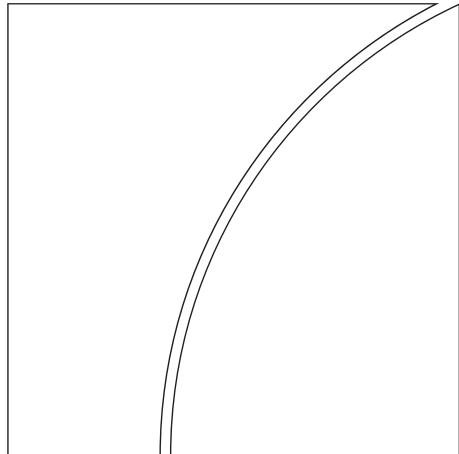




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## **Conventions used in this Report**

<b>lhs, rhs</b>	left-hand scale, right-hand scale
<b>billion</b>	thousand million
...	not available
.	not applicable
\$	US dollar unless specified otherwise

Differences in totals are due to rounding.

# 78th Annual Report

*submitted to the Annual General Meeting  
of the Bank for International Settlements  
held in Basel on 30 June 2008*

Ladies and Gentlemen,

It is my pleasure to submit to you the 78th Annual Report of the Bank for International Settlements for the financial year which ended on 31 March 2008.

The net profit for the year amounted to SDR 544.7 million, compared with SDR 619.2 million for the preceding year. The figure for the preceding year has been restated to reflect a change in accounting policy made in this year's accounts. Details of the results for the financial year 2007/08 may be found on pages 180–5 of this Report under "Financial results and profit distribution". The amended accounting policies are disclosed on pages 199–204, and their financial impact is disclosed in note 3 on pages 206–207.

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 amount compares to the dividend of SDR 255 per share paid out last year.

The Board further recommends that SDR 40.0 million be transferred to the general reserve fund, SDR 6.0 million to the special dividend reserve fund and the remainder – amounting to SDR 354.0 million – to the free reserve fund. In addition, it is proposed to deduct SDR 71.3 million from the free reserve fund for the prior year effect of the change in accounting policy.

If these proposals are approved, the Bank's dividend for the financial year 2007/08 will be payable to shareholders on 3 July 2008.

Basel, 10 June 2008

MALCOLM D KNIGHT  
General Manager



## I. Introduction: the unsustainable has run its course

The simmering turmoil in financial markets came to the boil on 9 August 2007. On that day, a number of central banks felt compelled to take extraordinary measures in an attempt to restore order in the interbank market. The disorder was triggered by a freeze on redemptions from a small number of funds that had invested in structured finance products backed by US subprime mortgages of recent vintage. When or where it will end, no one can say with certainty. The duration of the turmoil, its scope and the growing evidence of effects on the real economy have come as a great surprise to most commentators, private as well as public.

Yet it is essential that we understand what is going on. How could problems with subprime mortgages, being such a small sector of global financial markets, provoke such a dislocation? Answering this question is crucial to assessing how severe the economic consequences of these events might be. It is also crucial for determining how policy should respond. Current difficulties must be overcome as a first priority. But, equally importantly, new reforms must be introduced and implemented to reduce the likelihood of such potentially costly events being repeated. As difficult as today's challenges might be, they also provide a motivation for institutional change that should not be ignored.

To date, most analysis of the turmoil has focused on the market segments where it all began, and the particular role played by new financial developments. The school of "What is different?" has emphasised shortcomings in the way the originate-to-distribute model of banking was extended to the mortgage sector. It has also highlighted the expanded role played by highly innovative structured products, their encouragement by rating agencies, and the recourse to off-balance sheet vehicles by banks eager to reduce their use of regulatory capital. All of this is important and points to useful policy prescriptions.

Nevertheless, this approach only complements a more fundamental analysis that helps explain not only the recent financial turmoil, but also rising inflation as well as the sharp retrenchment in many housing markets. The school of "What is the same?" would note the parallels between this period of financial and economic turmoil and many earlier ones. Historians would recall the long recession beginning in 1873, the global downturn that began in the late 1920s, and the Japanese and Asian crises of the early and late 1990s respectively. In each episode, a long period of strong credit growth coincided with an increasingly euphoric upturn in both the real economy and financial markets, followed by an unexpected crisis and extended downturn. In virtually

every instance, some form of new economic discovery or new financial development provided a further “new era” justification for rapid credit expansion, and predictably became a focus for blame in the downturn. Against this background, even what has been identified as different, above, remains fundamentally the same.

### What has been happening: a description

Over the last two decades, much seems to have gone right in the global economy. Inflation has been maintained at very low levels almost everywhere and, until recently, was showing remarkable stability. At the same time, growth has generally been high, with that in the last four years being the fastest on record. Along with these features, economic downturns in the advanced industrial economies have been so shallow since the early 1980s that they gave rise to the accolade “the Great Moderation”. Moreover, the fact that the advanced industrial countries had proven so resilient to recurrent episodes of stress in financial markets was hailed as a further indicator of better functioning economies. In particular, the maintenance of low inflation by credible central banks was seen to have played a crucial stabilising role throughout most of the industrial world.

Yet the very mention of financial shocks leads on to two less reassuring questions. The first is why both the frequency and the magnitude of such episodes of financial stress seem to have risen. And the second, sparked in particular by the events surrounding the distressed hedge fund LTCM in 1998, is whether the centre of the global financial system might eventually prove as vulnerable as the periphery. The events of the past year have demonstrated that these causes for concern are not misplaced.

The financial turmoil began in the market for US subprime mortgages, and the markets for structured products based on them. Delinquency rates in the subprime market had started to rise in early 2005, almost contemporaneously with outright declines in house prices, but there was no significant market response to this development until early 2007. Credit spreads on such products then began to widen, rating downgrades increased, and the process accelerated sharply in August. The trigger, as already mentioned, was the decision by a small number of investment funds to freeze redemptions, citing an inability to value their complex assets. From this small beginning, the financial disruption then fanned out to virtually every corner of the system.

By early August, a combination of growing concerns about the valuations of complex products, liquidity risk and counterparty risk had led to a host of other markets being negatively affected. There was an effective collapse of the market for structured products based on mortgages, a massive withdrawal of investors from the asset-backed commercial paper market, and a sudden drying-up of interbank term money markets in the major currencies. This last development manifested itself in the form of an unprecedented gap between expected policy interest rates (over a one- to three-month horizon) and the rates at which the largest banks were prepared to lend to each other. While it was almost inevitable that difficulties in the subprime market would eventually

have some repercussions for the financial institutions at the centre of this market, the force and speed of the impact took virtually everyone by surprise.

Moreover, these disturbances in the short-term money markets quickly began to be reflected elsewhere, reinforced by growing pessimism about the macroeconomic outlook and a general rise in risk aversion. The rates on core government bonds from advanced industrial countries initially fell sharply. Simultaneously, high-risk corporate spreads widened, and the corporate takeover market virtually collapsed. Equity prices did not respond at once, but eventually fell significantly, in particular the shares of financial firms. In a number of countries, but especially the United States, residential property prices came under increasing downward pressure, and the commercial property market also began to soften. Finally, volatility rose sharply in most financial markets, as did the cost of purchasing insurance against that volatility.

Given the central role played in the US subprime market by banks headquartered in the United States and Europe, it was not surprising that they had begun to announce losses. More surprising, and worrying, was the frequency with which announced losses were revised upwards, and how much the ratio of revealed losses to known exposures diverged across banks. In the beginning, however, confidence was maintained that banks had adequate capital to absorb these losses. Thus, there was initially no concern that there would be a significant effect on credit conditions, much less a "credit crunch".

This assumption was threatened as early as the third quarter of 2007. It became increasingly clear that the size of banks' balance sheets, and the associated need for capital, were set to rise involuntarily as contracts made earlier to provide liquidity support were activated. Not least, a number of structured investment vehicles (SIVs) which banks had set up to hold assets off their balance sheets had to be reabsorbed as their independent sources of funding dried up. Confidence was further shaken, albeit later temporarily restored, around the turn of the year when a number of global banks announced both the need to supplement their capital levels and their success in raising equity from sovereign wealth funds. Another severe jolt to confidence came in March 2008, when Bear Stearns, a large US investment bank, ran into major financial difficulties with frightening speed. However, the erosion of confidence was more than offset when the Federal Reserve helped the bank to merge with the still larger but healthier JPMorgan Chase. Still more recently, concerns have also begun to mount about the capital adequacy of a number of medium-sized banks, particularly in countries where such banks have large exposures to the housing and construction sectors.

As for other financial institutions, they too were drawn into the drama. At money market mutual funds, withdrawals rose early in the turmoil but inflows later surged as investors sought safety. Correspondingly, the funds themselves became increasingly conservative and unwilling to provide term funds to banks. Hedge funds, dependent on prime brokers, faced calls for margin as asset prices fell, and these calls became increasingly insistent with time. Many were forced into asset sales, further depressing prices, and some even into default. A number of insurance companies and pension funds, while sheltered to some

degree by differences in accounting standards, announced sizeable losses related to subprime mortgages and associated structured products. Perhaps even more worryingly, a number of “monoline” insurers, which have traditionally used their high ratings to provide investment guarantees to borrowers such as US states and municipalities, were either downgraded or threatened with downgrades by rating agencies because of guarantees provided for structured products. In this way, concern about counterparty risk spread ever further.

In the United States, it was initially thought that the disturbances in the subprime sector would be contained, and that consumer spending and the general economy would not be much affected. In the event, neither of these assessments proved realistic. The housing sector suffered heavily under the weight of sharply falling house prices and a massive build-up of unsold homes. Moreover, as measured household wealth fell and job losses rose, consumer spending receded and the economy threatened to slip into recession. Again linked to the financial turmoil, evidence also began to mount around the year-end that credit conditions were tightening, to the potential detriment of both consumer and corporate spending. In other parts of the advanced industrial world, partially but by no means entirely insulated from the financial turmoil, growth remained rather more robust. Accordingly, the consensus forecast for Europe and Japan in 2008 was revised down less than for the United States. In parts of Europe, there was evidence that relatively weak consumer spending was holding back aggregate demand. Nevertheless, exports from both Europe and Japan remained strong, driven in both cases by demand from emerging market countries. China and other Asian countries were of notable importance, but so too were a large number of countries in Latin America, the Middle East and elsewhere which were benefiting from higher commodity prices and improved terms of trade.

These developments, together with the continued rapid growth of the emerging market economies, led to an increased focus on the sustainability of domestic demand in the emerging world. Towards the end of 2007 it was being suggested not only that these economies might “decouple” from the United States, but also that their increasingly strong fundamentals (and lack of exposure to the subprime market) had actually transformed them into a “safe haven” from the financial turmoil seen elsewhere. This optimism initially led to large-scale capital inflows and support for asset prices in many emerging market economies, even as asset prices elsewhere fell sharply.

As concerns mounted about the possible scale of the US downturn, however, the mood began to change. Indeed, upon closer scrutiny, doubts about the longer-term health of the emerging markets began to surface. In China, the extraordinarily rapid pace of fixed capital investment, much of it recently in heavy industry, fuelled worries about misallocations as well as the broader effects on both global commodity prices and the environment. In the Middle East, fears intensified that different countries might be pursuing similar strategic development plans that would eventually result in problems of excess supply. And in central and eastern Europe, large and rising current account deficits in many countries seemed increasingly unsustainable. Reflecting concerns of this nature, and financial developments elsewhere, capital inflows

have recently moderated, and by mid-May 2008 stock prices had fallen from previous highs in a number of important countries.

Rising inflation is another factor which has dampened optimism about sustained growth, not only in the emerging market countries, but in the advanced industrial countries as well. Higher food and energy prices have been at the heart of this development, but it is clear that inflationary pressures are now being seen across a broader front. While difficult to measure, it seems that the "gap" between global supply and demand had been very much reduced by the end of 2007. Indeed, the prices paid by a number of advanced industrial economies for imports from China, which had fallen for over a decade, have recently been rising significantly, and there are good grounds for believing this will continue. For countries whose currencies have recently depreciated, such as the United Kingdom and the United States, underlying inflationary pressures are highly likely to be exacerbated.

This combination of rising inflation pressures and financial disturbances slowing demand growth is open to a spectrum of interpretations. On the one hand, if slower growth were thought just sufficient to hold global inflation in check, albeit with a lag, this could be viewed positively. On the other hand, the eventual global slowdown could prove to be much greater and longer-lasting than would be required to keep inflation under control. Over time, this could potentially even lead to deflation, which would evidently be less welcome. Unfortunately, when one considers the possible interactions between a weakening real economy, high household debt levels and a severely stressed financial system, such an outcome, even if unlikely, cannot be ruled out entirely.

### What has been happening: an explanation

Many academics have theorised about the underlying causes of the recurrent periods of stress which have scarred the financial landscape for centuries. Hyman Minsky's work in the 1970s seems of particular relevance to current circumstances. He warned that a continuous worsening of credit standards over the years would eventually culminate in a moment of recognition and recoil (what others have since dubbed "a Minsky moment"), when market liquidity would dry up. For Minsky, however, the liquidity crisis was only a symptom of the underlying credit problem, reflecting the reality that market liquidity is always crucially dependent on the continued availability of funding liquidity. Irving Fisher painted a similar picture of deteriorating credit standards in his famous research into the origins of the Great Depression. Finally, a number of other prewar theorists warned about the danger of poorly assessed credits leading to asset bubbles, deviations in spending patterns from sustainable trends and an inevitable economic downturn.

Consistent with such concerns, a number of unusual economic and financial trends have indeed been very much in evidence in recent years. The first has been very rapid rates of growth of money and credit, amidst evidence for an underpricing of risk more generally. Such high rates of credit and monetary growth at the global level in recent years reflect the interaction of

monetary policy, the choice of exchange rate regime in a number of countries and important changes within the financial system itself.

It is perhaps best to begin by noting that policy interest rates in the advanced industrial countries have latterly been unusually low by postwar standards, due to the absence of any strong inflationary pressures. This outcome reflected the building-up of central bank credibility over many years, but was also facilitated by a combination of positive supply side shocks, largely related to globalisation, and weak investment demand in a number of countries (including Germany and Japan) in the aftermath of earlier periods of excessively rapid expansion.

This policy stance might have been expected to cause a general depreciation of the currencies of the advanced industrial countries, particularly the US dollar, relative to emerging market currencies. However, in many emerging economies, upward pressure on the currency was met over an extended period by an equivalent easing of monetary policy and massive foreign exchange intervention. The former is likely to have contributed to higher asset prices and increased spending in the emerging markets. The latter, via the investment of official foreign exchange reserves, is likely to have further eased financial conditions in the advanced industrial countries. In this way, the monetary stimulus to credit growth became increasingly global.

This is not to deny that changes in the financial system over the years have also contributed in an important way to unfolding events. In particular, the various innovations associated with the extension of the originate-to-distribute model have had a major impact. Recent innovations such as structured finance products were originally thought likely to produce a welcome spreading of risk-bearing. Instead, the way in which they were introduced materially reduced the quality of credit assessments in many markets and also led to a marked increase in opacity. The result was the eventual generation of enormous uncertainty about both the size of losses and their distribution. In effect, through innovative repackaging and redistribution, risks were transformed into higher-cost but, for a while at least, lower-probability events. In practice, this meant that the risks inherent in new loans seemed effectively to disappear, buoying ratings as well, until they suddenly reappeared in response to the trigger of some realised loss that was wholly unexpected.

It is also a fact that, prior to the recent turbulence, the prices of many financial assets were unusually high for an extended period. The rate of interest on long-term US Treasuries (the inverse of the price) was so low for so long as to be dubbed a "conundrum" by the previous Chairman of the Federal Reserve. Moreover, the risk spreads on other sovereign debt, high-yield corporate bonds and other risky assets also fell to record low levels. Equity prices in the advanced industrial countries continued to be well (if not clearly over-) valued, and those in many emerging markets rose spectacularly. Residential property prices hit record highs in virtually all countries with the exception of Germany, Japan and Switzerland, where property markets were still recovering from the excesses of the 1980s and early 1990s. Even the prices of fine wines, antiques and postage stamps soared. Similarly, the cost of insurance against market price movements (approximated by implied volatility)

was sustained at unusually low levels for many years. Admittedly, arguments about fundamentals can be adduced to support independently each of the above trends. However, in the spirit of Occam's razor, it is particularly notable that all of these patterns are also consistent with credit being freely available and having a low price.

Finally, it is also a fact that spending patterns in a number of countries have deviated markedly from what had been longer-term trends. In the United States and a number of other major economies, household saving rates trended downwards to record low levels and were often associated with mounting current account deficits. By contrast, in China there has, equally unusually, been a massive increase in fixed investment. As with high asset prices, these patterns are consistent with a plentiful supply of cheap credit.

Taken together, the above facts suggest that the difficulties in the subprime market were a trigger for, rather than a cause of, all the disruptive events that have followed. Moreover, these facts also suggest that the magnitude of the problems yet to be faced could be much greater than many now perceive. Finally, the dominant role played by rapid monetary and credit expansion in this explanation of events is also consistent with the recent rise of global inflation and, potentially, higher inflation expectations.

Given such a complex environment, it will obviously be difficult for policymakers to maintain price stability, significant real growth and financial stability all at the same time. Equally obviously, different policymakers might reasonably arrive at different conclusions as to what needs to be done using policy instruments. In turn, this might have implications for exchange rate movements as well, posing a further complication for policymakers.

### What has been happening: the policy response to date

Almost from the first day of the turmoil, central banks overseeing the major financial centres responded to the seizing-up of money markets with more frequent and sometimes larger than normal money market operations. While different operating systems across countries occasionally made their efforts look dissimilar, they all shared the same primary objective of ensuring that overnight rates stayed effectively at levels consistent with policy goals. As time passed, a number of central banks augmented their standard procedures, being prepared in particular to accept a wider range of collateral from a wider set of institutions, to engage in operations at longer maturities, and to coordinate their efforts internationally. The Federal Reserve felt the need to be especially flexible. It successfully introduced a new facility to auction discount window credit, to address the stigma associated with the traditional use of the discount window. Moreover, after the assisted takeover of Bear Stearns, the Fed agreed to extend loans to primary dealers as part of its normal operations, although these firms are not commercial banks and, indeed, are not even supervised by the Federal Reserve System.

At the beginning of the turmoil, many thought that such liquidity injections would suffice to deal with what was perceived as largely a liquidity crisis. However, as time progressed and evidence accumulated of weakening

economic activity and growing counterparty risk, it became clearer that such measures, though necessary, might well be insufficient. They would buy welcome time, but would need to be supplemented with other policies, both cyclical and structural.

Given its flexibility, it is not surprising that attention first turned to monetary policy, which almost everywhere has been easier than was expected six months ago. That said, the complexity of the circumstances has led to a wide variety of responses.

In a number of countries, in particular Australia, Norway and Sweden, policy rates have been increased. Evidently, it was judged that, in some combination, the remoteness of the domestic financial sector from the crisis, the level of observed inflation and inflationary pressures warranted such tightening. In a number of other jurisdictions, in particular the euro area, policy rates have been left unchanged in spite of earlier indications that they might be raised. Here, the judgment seems to have been that high measured inflation, strong economic momentum and concerns about upward pressures on wages effectively counterbalanced the prospective threats to growth and disinflation arising from any potential unwinding of previous excesses. Finally, in some countries policy rates have been reduced, in the case of the United States dramatically so. There, the threat of recession was seen to be most evident and it was believed that, in the interim, inflation expectations were not likely to move up to a persistently higher level.

The potential for fiscal policy to be used to maintain global growth was also widely discussed. However, those few countries whose previous disciplined behaviour had increased their room for manoeuvre were also those whose economies were showing the most momentum. As a result, the only countries that did act speedily were the United States and Spain. All the same, some other measures that could ultimately affect taxpayers were also implemented. Most prominently, some US government-supported agencies have been attempting to support prices by buying large volumes of mortgage-backed securities, and by extending guarantees against other such instruments. In Germany, direct state support was provided for a number of institutions caught up in the US subprime crisis. In the United Kingdom, the eventual need to nationalise the country's fifth largest bank, Northern Rock, clearly spread the government's potential liabilities even wider.

The turmoil has also elicited a strong regulatory response. Regulators in a number of countries encouraged their banks to seek private sector recapitalisation. Increased transparency about valuation methodologies and associated disclosure of losses were also recommended in a number of analytical studies, from both the public and private sectors. And, finally, numerous recommendations were made as to how lending criteria and the use of structured products might be improved in the future. Implementation will, however, face many difficulties, not least the need to avoid exacerbating near-term market tensions in the pursuit of laudable medium-term objectives.

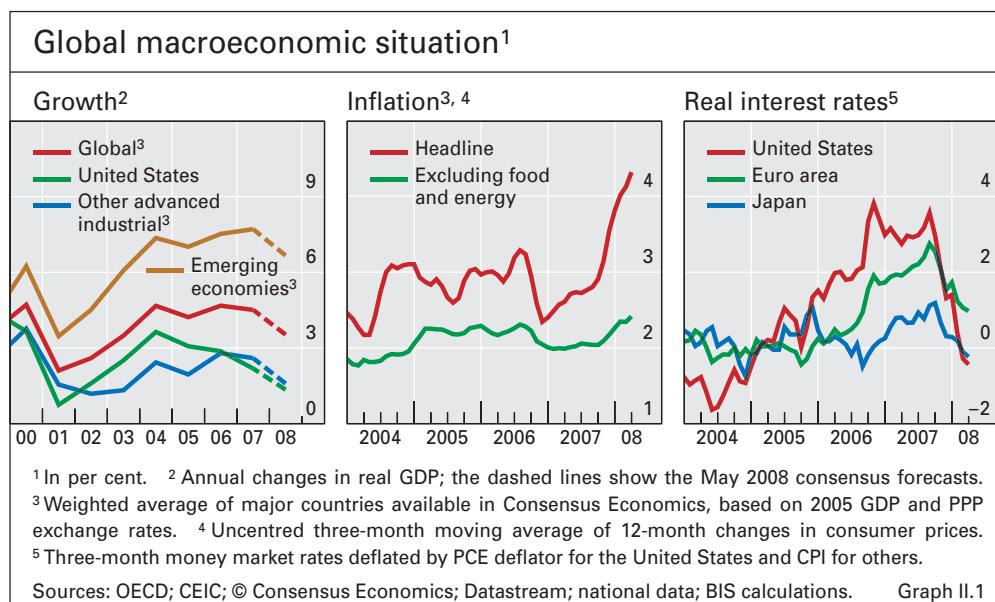
## II. The global economy

### Highlights

The turmoil in several major financial centres, triggered by a growing awareness of the exposure of major banks to poor-quality mortgages in the United States, has shaken consumer and investor confidence worldwide. As the US economy slowed and financing conditions tightened, demand in a number of other advanced industrial economies weakened (Graph II.1). At the same time, however, global inflation has risen, led by rapid increases in prices of energy and key food items.

Despite the turmoil, the consensus view is still that the global economy will avoid a sharp and synchronised downturn of the kind seen in 2001, although it will slow significantly in 2008. The baseline consensus scenario is that a US downturn will be accompanied by weaker growth in the euro area and Japan; growth in major emerging markets, while also slowing, will remain strong. Not only would such a scenario provide some welcome relief from inflation pressures, but the pattern of demand projected would imply a further decline in the US current account deficit.

Unfolding developments at the core of the global financial system have, however, also created great uncertainty about future economic prospects. In particular, the ultimate size of losses facing major banks still remains difficult to gauge. How the financial industry and its regulators respond will have far-reaching implications for the global economy. A generalised squeeze in the availability of credit in major advanced industrial economies remains a distinct possibility, with potentially more severe implications for demand than are reflected in the current consensus forecasts. In addition, the US downturn



could prove to be deeper and more protracted, given the high indebtedness of the household sector. How emerging markets would be affected also remains unclear: indeed, the abrupt weakening of equity prices in emerging markets in early 2008 suggests that a shift in sentiment might already have occurred. If inflation expectations remain well anchored, despite large oil and food price shocks, easier monetary conditions could help. Even so, questions remain about the effectiveness of easier monetary policy if, at the same time, banks were to ration credit and economic agents were to curb spending in an attempt to repair balance sheets.

## Overview of developments

Last year was marked by two distinct phases of development in the global economy. During the first half of the year, demand in the major advanced industrial economies was sustained by easy financing conditions, steady income growth and robust business confidence. Most economies enjoyed strong growth during this period. In the United States, residential investment fell but other components of demand, notably private consumption and business investment, held up. The dynamics changed in the second half of 2007 as the US housing and labour markets deteriorated sharply and the financial crisis deepened.

A shift in global growth momentum ...

Contributions to global demand, consumption and investment <sup>1</sup>					
	In per cent and percentage points				
	1995	2000	2005	2006	2007
Real GDP					
Global <sup>2</sup>	3.8	4.8	4.2	4.7	4.5
United States	0.6	0.9	0.8	0.7	0.5
Euro area	0.6	0.8	0.3	0.5	0.5
Other advanced industrial <sup>3</sup>	0.4	0.6	0.4	0.5	0.5
Emerging economies <sup>4</sup>	2.2	2.5	2.7	3.0	3.0
Real consumption <sup>5</sup>					
Global <sup>2</sup>	3.5	4.7	4.3	4.5	4.7
United States	0.7	1.2	0.8	0.8	0.7
Euro area	0.5	0.6	0.3	0.4	0.3
Other advanced industrial <sup>3</sup>	0.4	0.4	0.4	0.4	0.5
Emerging economies <sup>4</sup>	1.9	2.5	2.8	2.9	3.2
Real investment <sup>6</sup>					
Global <sup>2</sup>	4.6	6.4	7.7	7.1	5.7
United States	1.4	1.5	1.5	0.6	-0.5
Euro area	0.5	1.0	0.6	1.0	0.8
Other advanced industrial <sup>3</sup>	0.3	0.4	0.8	0.8	0.5
Emerging economies <sup>4</sup>	2.4	3.5	4.8	4.7	4.9

<sup>1</sup> Changes over one year. <sup>2</sup> Growth in the economies listed, in per cent; weighted by 2005 GDP and PPP exchange rates. <sup>3</sup> Australia, Canada, Denmark, Japan, New Zealand, Norway, Sweden, Switzerland and the United Kingdom. <sup>4</sup> Argentina, Brazil, Chile, China, Colombia, the Czech Republic, Hong Kong SAR, Hungary, India, Indonesia, Korea, Malaysia, Mexico, the Philippines, Poland, Russia, Saudi Arabia, Singapore, South Africa, Taiwan (China), Thailand, Turkey and Venezuela. <sup>5</sup> Private final consumption expenditure. <sup>6</sup> Gross fixed capital formation.

Sources: IMF; Datastream; national data.

Table II.1

... with slower growth in major advanced industrial economies ...

... but relatively robust activity in emerging markets

The current downturn has deepened further in 2008 ...

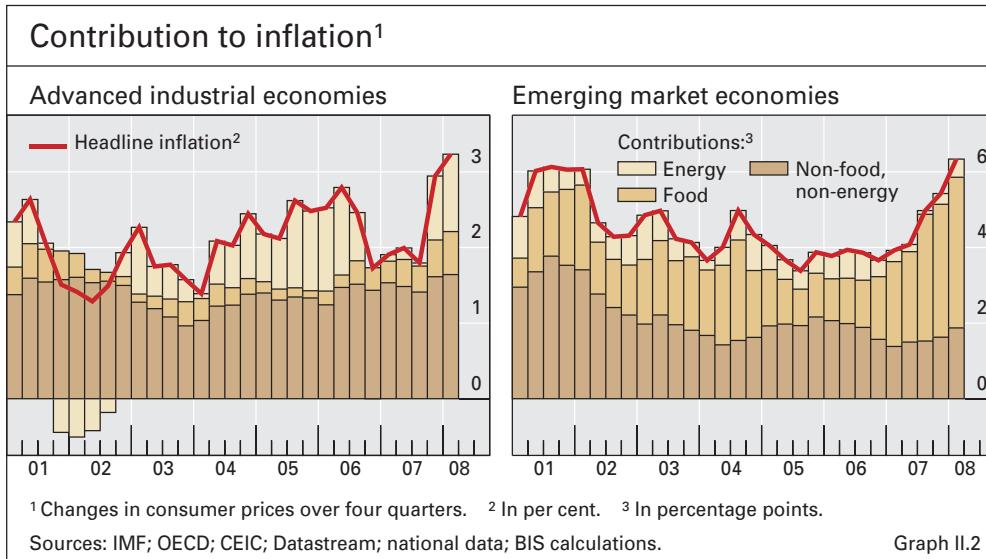
... accompanied by mounting inflation

While global output still grew at a healthy pace of 4½% in 2007, output growth in the G3 economies decelerated from close to 3% in 2006 to less than 2½% in 2007. The slowdown also spread to several other advanced industrial economies. As a result, import volumes of the advanced industrial economies, which had been growing at 6–9% since 2004, slowed to a rate of just above 3% in 2007. Yet the impact of this on emerging market economies has so far been limited. Strong domestic demand in Brazil, China and India, among others, raised aggregate output growth in emerging market economies to over 7½% in 2007 (see Chapter III).

This pattern of growth was associated with several key changes in the global economy. First, the contribution of emerging economies to global growth rose in 2007, continuing the trend seen in the past few years (Table II.1). Second, the downturn in residential investment in advanced industrial economies contributed to a slowdown in global investment demand, even though capital spending in emerging economies strengthened. In contrast, global consumption growth remained fairly steady, supported by robust household spending in both advanced industrial and emerging economies. Third, these changes in growth and demand patterns led to a welcome reduction in global current account imbalances. The US current account deficit fell from \$811 billion in 2006 to an annual rate of \$692 billion by the fourth quarter of 2007, or from 6.2% to 4.9% of GDP. The main counterparts of this adjustment were an increase in deficits in Australia, the United Kingdom and central and eastern Europe as well as somewhat smaller surpluses in Russia and Latin America. In contrast, the aggregate surplus of Asian economies rose sharply, with China's surplus, in particular, reaching a record high of \$372 billion in 2007.

Several negative shocks have further weakened the global economy in 2008. First, the downturn in the US housing sector has intensified, with sharply falling house prices. By early 2008, the US economy appeared to be heading towards very slow growth. Second, the turmoil in mortgage and related markets has led to a marked increase in risk aversion more generally. Despite central banks' concerted efforts to stabilise interbank markets, credit and interest rate spreads have risen since July 2007. With banks in several advanced industrial economies tightening lending standards, concerns about a credit crunch have become commonplace. Third, there has been a further sharp rise in commodity prices. Over the year to April 2008, the aggregate price index for major food products increased by 30%, and oil prices (Brent) rose by more than 60%. The latest upsurge in commodity prices follows several years of rising prices (see Chapter III).

Largely because of higher food and energy prices, headline inflation has risen markedly in both advanced industrial and emerging economies (Graph II.2). Even measures that exclude food and energy items from the consumer price index have edged up in many countries. In addition, long-term inflation expectations, using measures derived from bond prices, have moved up in the United States and, to a lesser extent, in the euro area since the second half of 2007. Survey-based consumer inflation expectations have also risen in several countries. In part, this may be because sharp increases in the prices of frequently purchased items, such as food and petrol, have raised perceptions of past inflation and inflation expectations in turn.



## Global demand developments

### *The cyclical downturn in major advanced industrial economies*

The continued decline in the housing market (Graph II.3) has weighed heavily on US growth since the second half of 2006. One major feature that distinguishes the recent housing sector difficulties from those of the past is that the latest upswing in construction in the United States resulted in much greater excess supply than before, as increases in new dwellings far exceeded population growth. Since late 2006, over 2½% of the owner-occupied housing stock – double the average of the past five decades – has been vacant and for sale. In the run-up to the recessions of the early 1980s and 1990s, for instance, the vacancy rate had remained well below 2%. Even though housing starts have fallen by about 60% since 2006, to reach levels last seen in the early 1990s trough, this supply overhang is likely to weigh on both construction and house prices for some time to come.

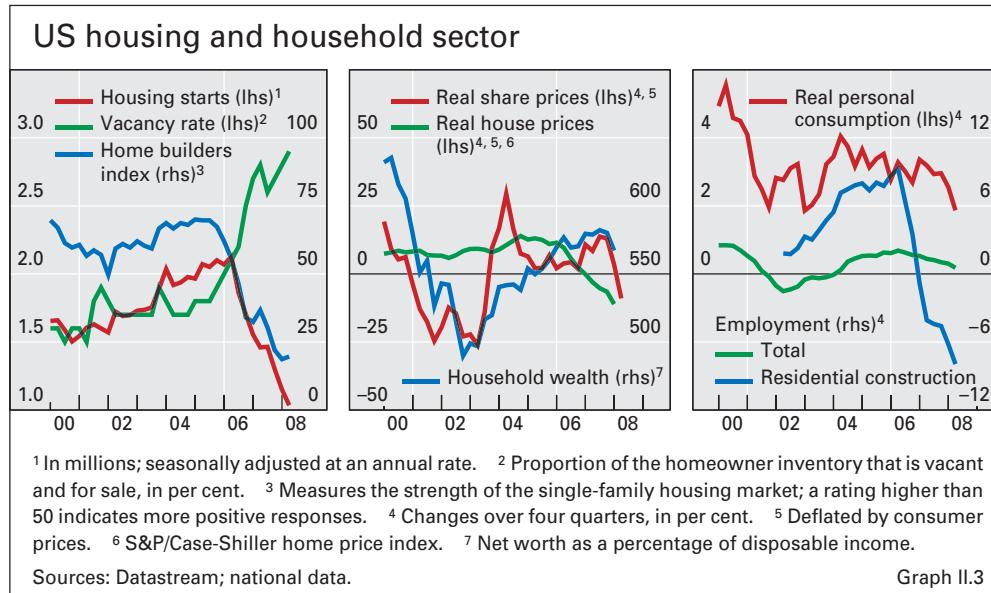
The US slowdown is distinguished by a large overhang of excess housing supply ...

In particular, speculative factors have played a more significant role in the construction of single-family homes than in the past. Many of the new houses seem to have been bought for resale or rent, ahead of the underlying demographic demand for them. As a result, investment in single-family residential structures rose to a record 3½% of GDP in 2006 from 2½% in the early 2000s.

... and speculative construction

The US housing downturn began to affect other sectors of the economy in early 2007. Residential investment directly subtracted 1 percentage point from GDP growth in 2007; in addition, declines in house and equity prices hurt household wealth (Graph II.3). Coupled with a broadly based decline in employment and higher energy prices, these developments weakened consumer spending. As a result, the contribution of personal consumption to growth fell from 2 percentage points in 2007 to 0.7 percentage points in the first quarter of 2008. Spending on durable goods, which is most sensitive to changes in wealth and credit market conditions, contracted sharply (at an annual rate of 6% in the first quarter of 2008).

The US housing downturn spilled over to consumption ...



... with a risk of further sharp adjustment

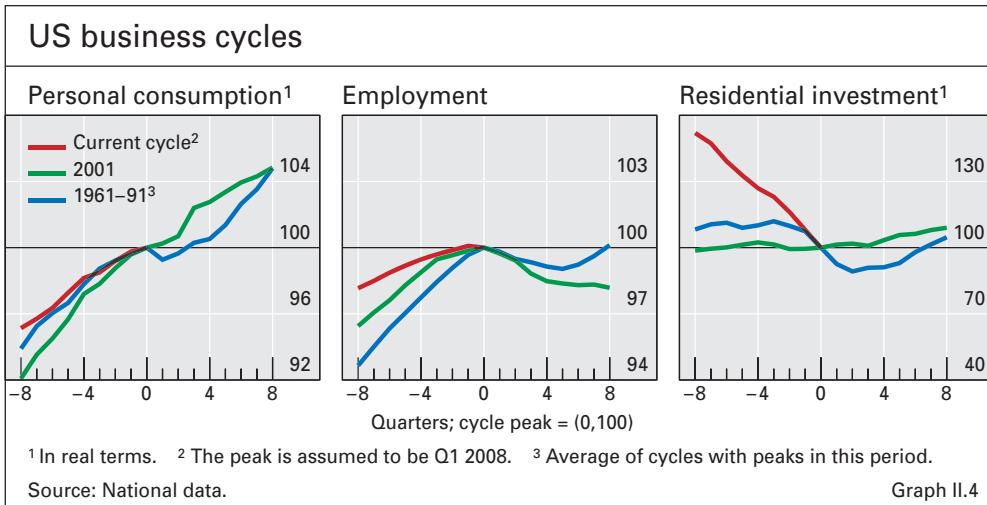
Downside risks are also rising for investment ...

... but strong exports may contain the damage

The current US downturn presents similarities as well as differences with past cycles. In line with typical pre-recession behaviour, private consumption grew steadily in the run-up to the recent cyclical peak, despite employment growth being weaker than average (Graph II.4). With the household saving ratio currently unusually low, and debt levels unusually high, consumption might be expected to be much weaker in the current cycle than during previous ones. Residential investment has already fallen more sharply this time than during the run-up to previous downturns and, as noted above, could well fall further.

A crucial factor will be the behaviour of US non-residential construction. Having risen rapidly in previous quarters, investment in non-residential structures slowed sharply in the first quarter of 2008. As discussed below, the risk of further weakening remains large in the context of tighter credit conditions and negative feedback effects from the residential sector. During the early 1990s recession, the share of construction (both residential and non-residential) in GDP fell from a high of 11% in 1985 to just over 8% in 1992. In the current cycle, the construction share reached a similar high in 2006, but so far has fallen by a little more than 1½ percentage points.

Among other components of demand, business equipment spending has contracted, although the extent of future correction remains uncertain. The manufacturing sectors most exposed to construction are likely to see large cuts in investment, and a further weakening of consumption could aggravate this adjustment by dampening demand and profit expectations. Yet, in contrast to the 2001 downturn, the absence of earlier overinvestment should ensure a smoother downward adjustment in equipment spending this time. Moreover, a brighter spot for the US economy has been strong net exports, whose contribution to GDP growth reversed from negative to positive in 2007 (½ percentage point). This could prove important in raising investment in the tradables sector, which had suffered during the period of dollar appreciation.



Of the other major advanced industrial economies, the United Kingdom shared some features with the United States. The UK economy appeared to have slowed towards the end of 2007, as consumption was dampened by tighter credit conditions and weakening confidence. Falling property prices also raised the spectre of a downturn in the construction sector. Similarly, in Canada, although aggregate demand continued to exceed domestic productive potential until last year, the economy began to weaken as exports fell. In addition, tighter credit conditions started to affect demand.

Developments in the euro area and Japan have been mixed. Despite some deceleration, growth in the euro area proved strong up to the first quarter of 2008. In particular, investment grew at a solid pace in 2007. Although Ifo business confidence indicators fell in April 2008, they still remained above the average for the past five years. However, private consumption decelerated significantly towards the end of 2007 as confidence slid. Moreover, exports have slowed in recent months. The Japanese economy also continued to expand up to the first quarter of 2008, thanks largely to strong exports. Consumption remained relatively robust, with employment rising into early 2008. But a rapid contraction in residential investment from the second half of 2007, led by changes in construction regulation, reduced the tempo of domestic demand. In addition, business sentiment indicators have deteriorated in recent months, and profit expectations have fallen.

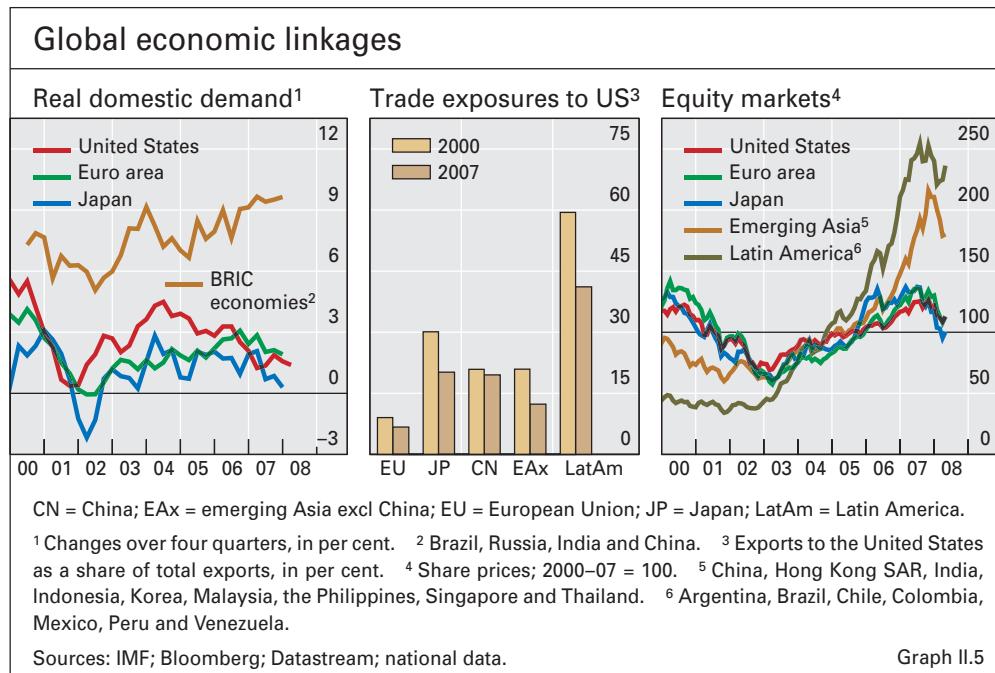
#### *International linkages and economic prospects*

While in past cycles a US slowdown was often associated with slower growth elsewhere, there are grounds for believing that such effects might remain more muted in the current cycle. Indeed, there have been some developments consistent with this view over the past few years. While the annual growth rate of domestic demand in the United States fell from 4.1% in 2004 to 1.5% in 2007, it declined from 2% to 1% in Japan and even strengthened slightly in the euro area, from 1.7% to 2.2%. Moreover, in even sharper contrast to the United States, domestic demand in the large emerging economies (particularly Brazil,

Signs of slowdown also emerged in other economies

Growth in the euro area and Japan has been somewhat less affected so far ...

... leading to some divergence in demand cycles ...



Russia, India and China) continued to grow rapidly throughout the period (Graph II.5).

... for a variety of reasons

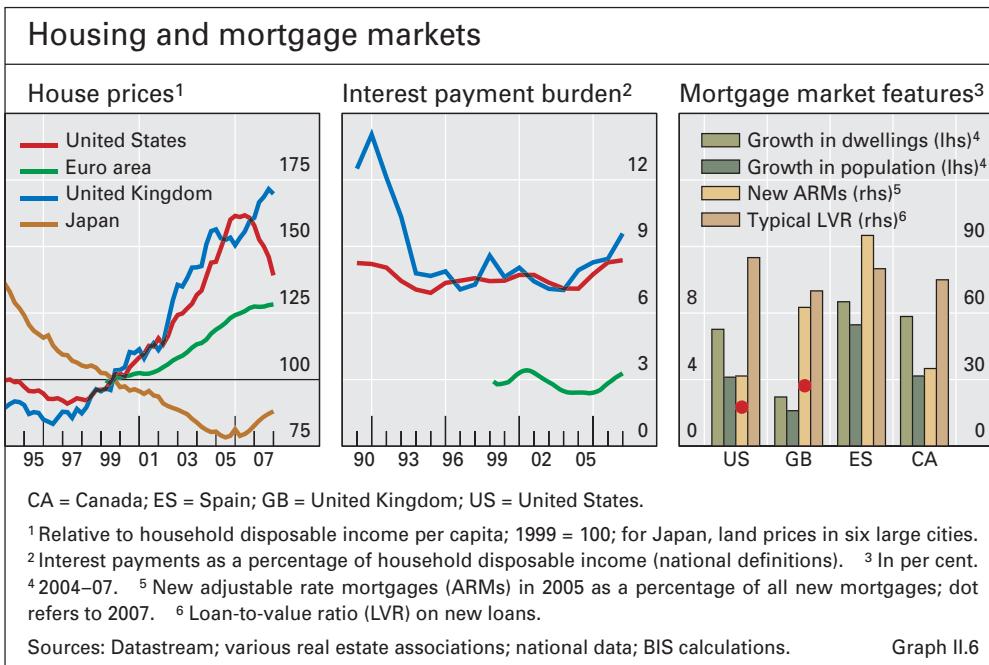
Diverging demand patterns have led some observers to believe that the rest of the world could offset some of the negative demand shocks originating in the United States. One argument in support of this hypothesis notes that the imbalances in the rest of the world are arguably less severe than in the United States. This contrasts with the early 2001 slowdown, which was caused by the bursting of a global IT investment boom. The fact that the share of exports destined for the United States has declined significantly in a large number of economies has been cited as a further reason why the US slowdown may have a limited impact on the global economy.

Demand in the euro area could prove more resilient this time ...

Leaving aside the United States, the prospects for domestic demand in other major economies seem favourable on balance, but also show significant variability. In the euro area, domestic demand has been sustained by a broadly based rebound in business investment. In addition, the recent fall in the euro area unemployment rate could help to support consumption. At 7.1% in the first quarter of 2008, the unemployment rate reached its lowest level since the early 1980s. This is particularly evident in Germany, where structural reforms have led to increased labour flexibility and a higher participation rate. Real wages have also started to pick up in Germany, although they remain depressed and are still increasing more slowly than the rate of growth in labour productivity.

... although divergence within the euro area is large

Domestic demand cycles have already diverged within the euro area, partly reflecting different housing market dynamics. Nominal house prices in the euro area as a whole have risen more gradually over the past decade than, for instance, in the United States and the United Kingdom (Graph II.6). This has, to some extent, reflected the trend in Germany, where house prices either remained stable or declined moderately during 2000–07. In France, Ireland



and Spain, however, they rose strongly in the early 2000s before starting to decelerate in 2004–06. Growth in dwellings has also outpaced population growth in some countries, particularly Spain, although not to the extent seen in North America. During the upswing, value added in construction reached 11% and 9% of GDP in Spain and Ireland, respectively, much higher than the euro area average of 6%. Higher house prices also appear to have supported consumption, particularly in France and Spain. With the house price cycle turning and credit conditions tightening, demand is likely to weaken more in these countries than elsewhere in the euro area.

Domestic demand in Japan has been sustained by very easy financing conditions, which have led to a large gap between the rate of return on investment by large manufacturing firms and their borrowing costs. In contrast, smaller firms, which traditionally have narrower profit margins and low pricing power, have proved more vulnerable to cost pressures. Moreover, consumption has so far been driven by employment. Although nominal wages rose in early 2008, following several quarters of negative growth, real wages remained weak. Several structural factors may continue to limit future wage growth. These include the retirement of baby boomers and their replacement by lower-paid employees, and a striking increase in the share of part-time work since the early 2000s. Consumption therefore remains vulnerable to a squeeze of household income from weak real wages, particularly in the context of higher energy prices.

As discussed in Chapter III, domestic demand in emerging market economies seems to have become more robust than in past cycles, due to improved macroeconomic fundamentals and stronger balance sheets. The steady increase in capital inflows to many emerging market economies has also boosted prospects for investment. But higher food and oil prices have hurt consumer sentiment in recent months, particularly in commodity-importing countries in Asia.

While prospects for domestic demand seem weaker in Japan ...

... they have improved in emerging economies

Yet the United States is still a major trading partner

There are also reasons for thinking that the full global impact of the US slowdown might be still to come. The United States remains a major trading partner for several countries, including Canada, China, Japan and Mexico. Imports in the US high-tech sector have remained strong, limiting the adverse impact on Asian intraregional trade, but the situation could change if the US downturn deepens. A prolonged US slowdown could undermine consumer and business confidence worldwide: the sharp decline in stock markets around the world in January 2008 underlined such a risk. In addition, many firms in China and Japan are dependent on exports to the United States to sustain investment and employment, implying that capital spending might not be as autonomous in these countries as is often assumed. Similarly, exports remain a major source of demand in Germany. This exposes the euro area to a potential slowdown in other economies, including the United States, not only through direct effects on the German economy but also through indirect effects on intraregional trade and investment.

Several common shocks could also weaken global demand

Global demand is also likely to be depressed by several other shocks that have coincided with the US slowdown. First, the negative demand shock could be compounded by a generalised squeeze in credit supply in advanced industrial economies; this issue is examined below. Second, substantial increases in commodity prices, especially oil, over the past several months have led to large terms-of-trade losses for oil-importing countries. Analysis by the International Energy Agency following the early 2000s oil price hike suggested that a \$10 per barrel increase in average oil import prices in OECD countries could reduce growth by 0.4 percentage points and raise inflation by 0.5 percentage points within one year. In fact, average oil import costs in major OECD countries have already increased by \$35 per barrel over the year to January 2008.

The actual impact on growth has been limited so far partly because firms have been reluctant, or unable, to pass on the full extent of the increase in oil prices to consumers. In addition, rising wealth from increased house and equity prices as well as the easy availability of bank credit up to mid-2007 sustained consumption. However, a substantial deterioration in employment and wealth prospects could reinforce the effect of higher oil and food prices on household spending, particularly in countries where consumption has relied significantly on debt accumulation.

#### *Policies and other factors affecting future demand*

Prompt central bank actions and lower policy rates could stimulate demand ...

Policies to counter global demand weaknesses could help, provided that inflationary pressures remain well contained. Massive liquidity operations by major central banks might have limited the potential impact of the recent financial turmoil on banks' funding costs. In addition, the stance of monetary policy has been eased in several advanced industrial economies since August last year. Yet the impact of these measures on demand depends crucially on several factors. One is the assessment of credit risks. In the United States, for instance, where monetary easing has gone the furthest, less risky household lending rates have fallen, but rates on riskier jumbo mortgages and sub-investment grade bonds have risen because of higher risk premia. A second

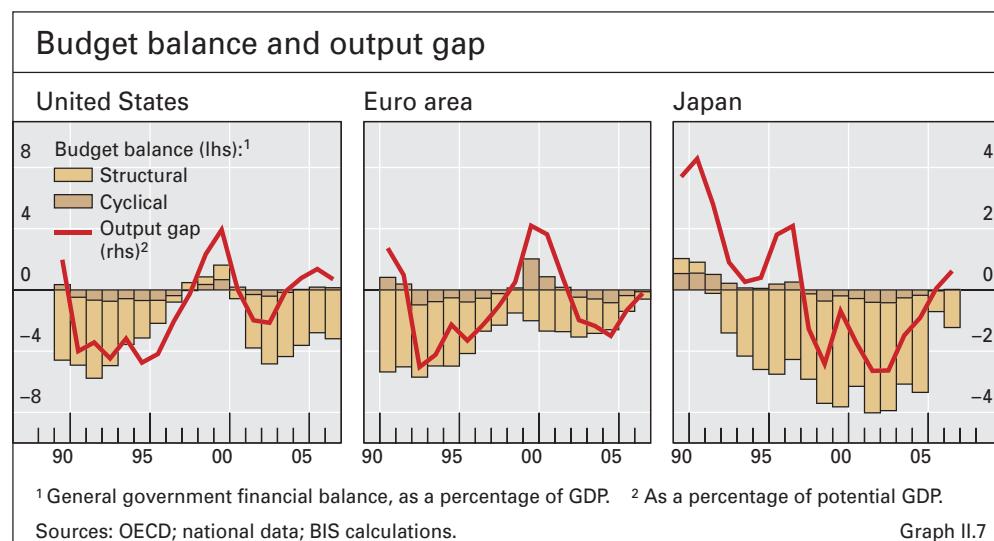
factor is that banks might cut credit supply through non-price mechanisms, reducing the impact of lower policy rates. A third factor is the large overhang of household debt that could lead households to save rather than spend (discussed below). Aside from the aggregate demand impact of lower policy rates, a key risk is that the future flexibility of monetary policy could be constrained by the recent rise in inflation and inflation expectations.

An easier fiscal policy could also support demand in some countries. Automatic stabilisers will help to cushion demand, especially in the euro area (Graph II.7), in the case of a slowdown. Moreover, the structural budget deficit in the euro area has been declining over the past few years, in accordance with the requirements of the Stability and Growth Pact. Reflecting this additional room for manoeuvre, budget plans for 2008 envisage a slight increase in the structural deficit to 0.9% of GDP. In Japan, the structural deficit is expected to decline in 2008. In the United States, the budgetary position, on balance, has remained supportive of demand in the short run. The recent fiscal stimulus, involving personal and corporate tax rebates to the tune of 1% of 2007 GDP, is expected to temporarily boost demand this year.

One major question is whether there is scope for using discretionary fiscal policy to stimulate demand still further. In the United States, the debt/GDP ratio is already around 60%, and would be much higher if unfunded liabilities from long-term health care and pension costs were taken into account. In the euro area, low deficits or continued surpluses in Austria, Germany and Spain, as well as the projected fall in debt ratios, could imply greater scope for the authorities in these countries to use fiscal policy to sustain demand. But in Greece and Italy, public debt ratios were around 100% at the end of 2007 and are projected to remain high in the future. In almost all euro area countries, unfunded liabilities due to future health care and pension expenditures remain large in the context of rapidly ageing populations. In Japan, gross public debt already exceeds 180% of GDP, and implicit public sector liabilities are also large. While the overall tax rate is low and could eventually be raised, the reality of an already declining population is a further complication.

... as could  
expansionary fiscal  
policy

However, the scope  
for fiscal stimulus  
varies across  
countries ...



... and there is uncertainty about its effectiveness

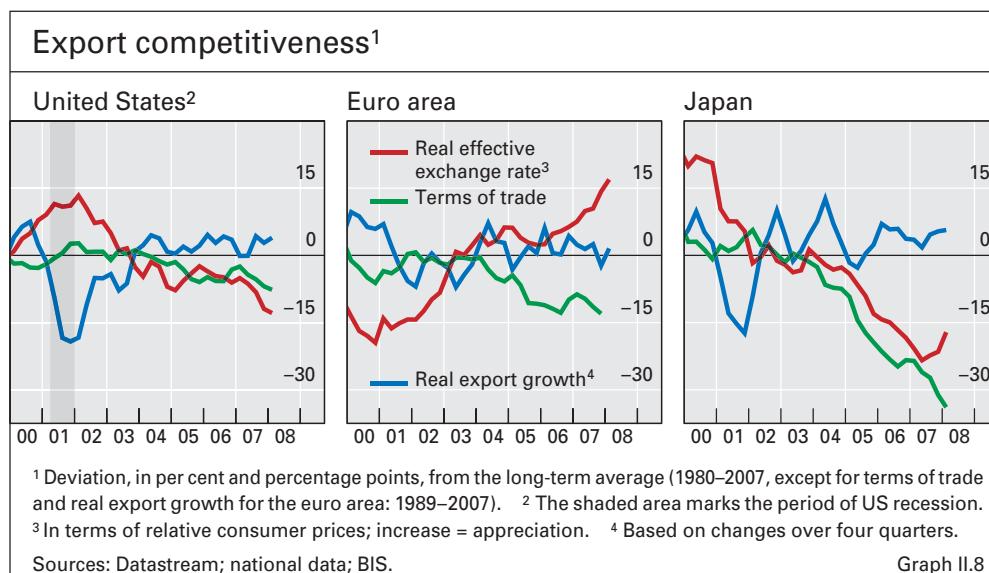
Dollar depreciation could support US growth ...

... but puts strong competitive pressures on the euro area economies

Another question relates to the effectiveness of fiscal policy. Fiscal multipliers appear to have become weaker in advanced industrial countries over the past decades, with the increased openness of their economies as well as financial liberalisation reducing the number of liquidity-constrained individuals. Even so, adequately targeted stimulus programmes could still prove useful, especially if they reduced spending constraints for those who have lost their access to credit. A temporary stimulus would also limit future deficits and consequently the impact of any perceived rise in future tax burdens. Recent estimates in the case of the United States suggest that the marginal propensity to consume out of temporary tax rebates could be significant (about 0.4), and the impact could materialise rapidly. However, the phase-out of the effects of such rebates would be likely to drag down growth in later periods.

One factor with implications for the distribution of global demand has been the changing pattern of exchange rates. The real effective value of the US dollar had, by April 2008, fallen 25% from its February 2002 peak. Even when compared to the long-run average over 1980–2007, the depreciation of the dollar has been substantial (Graph II.8). A weaker dollar will continue to support US growth, by raising both exports and demand for goods produced by domestic import-competing sectors. In addition, a weaker dollar enhances the domestic currency value of US earnings on foreign assets, reinforcing the positive trade impact. At the same time, however, an abrupt fall in the dollar could lead to higher inflation expectations, and make it harder to control inflation.

By contrast, the effective value of the euro has appreciated sharply over the past two years. This has reduced the effect of higher dollar oil prices, but it also dampens the demand for euro area tradables. Exports from the euro area have nonetheless continued to grow around the long-run rate, thanks to strong demand in emerging markets. Improved productivity growth in the German manufacturing sector has offset some of the negative competitiveness effects of a stronger currency. In other euro area countries (eg Italy and Spain),



however, competitiveness has deteriorated. For its part, the real effective value of the yen has depreciated substantially over the past few years, helping to stimulate exports from Japan.

## Inflation developments in advanced industrial economies

### *Rising inflation risks*

A sharp rise in commodity prices since early 2007 has led to a major increase in headline inflation in advanced industrial economies. The year-on-year CPI inflation rate in April 2008 was around 4% in the United States and above 3% in the euro area; and in Japan it finally exceeded 1% by March (Graph II.9). In the United States, domestic energy prices increased by over 15% in the year to April 2008 while food and beverage price inflation reached an almost two-decade high of about 5%. In the euro area, energy price inflation exceeded 10%, and food prices rose by 6%. Energy prices accounted for about one third of headline inflation in the United States and the euro area. In addition, core inflation (based on national definitions), which had been relatively subdued until 2006, picked up in the euro area and Japan. In the United States, the core CPI inflation rate remained relatively stable up to April 2008.

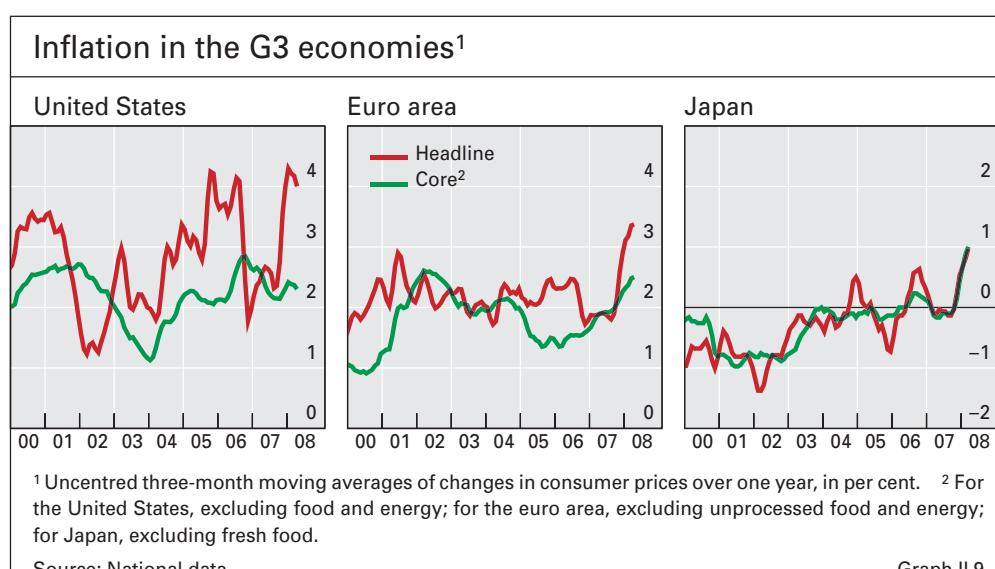
A key issue is whether food and oil prices will remain high. If the expansion in long-run demand continues to outpace the supply of key commodities, a sustained increase in food and energy prices remains a distinct possibility. Consumer food price inflation in many advanced industrial economies is likely to remain high for some time as higher producer prices feed through to the retail level and as cost pressures squeeze firms' margins beyond sustainable levels.

In the past, headline inflation tended to follow core inflation, largely because food and oil price volatility reflected short-lived supply disturbances. This encouraged central banks to focus their attention on core inflation as a measure of underlying price pressure. But the prolonged rise in commodity

Higher inflation led by commodity prices ...

... raises the question of inflation persistence ...

... and is also a challenge to monetary authorities in assessing inflation pressures



Inflation forecast performance <sup>1</sup>						
	Forecast period: Jan 2001–Apr 2003		Forecast period: May 2003–Sep 2005		Forecast period: Oct 2005–Mar 2008	
	Headline	Core <sup>2</sup>	Headline	Core <sup>2</sup>	Headline	Core <sup>2</sup>
US CPI	0.88	0.86	0.67	0.79	1.05	1.14
US PCE deflator	0.51	0.48	0.79	0.90	0.87	0.98
Euro area HICP	0.52	0.87	0.32	0.34	0.64	0.84
Japan CPI	0.93	0.70	0.40	0.28	0.54	0.50

<sup>1</sup> Root mean squared error (RMSE) from out-of-sample twelve-month-ahead inflation forecast obtained by regressing annual headline inflation on either headline or core inflation (estimation period: January 1991–December 2000). The shaded areas indicate a smaller RMSE within each forecast period. <sup>2</sup> For the United States, excluding food and energy; for the euro area, excluding unprocessed food and energy; for Japan, excluding fresh food.

Sources: National data; BIS estimates. Table II.2

prices in recent years has weakened this relationship (Table II.2). In the euro area, for instance, headline inflation has been a much better predictor of one-year-ahead inflation than core inflation during the past three years. In the United States, headline inflation has also yielded somewhat better inflation forecasts than core inflation since mid-2003, when the prices of energy began to trend upwards. Japan's experience has been somewhat different: the nationally defined core inflation measure is still a better predictor of future headline inflation, although this could be largely because the former includes oil prices.

#### *Factors driving core inflation*

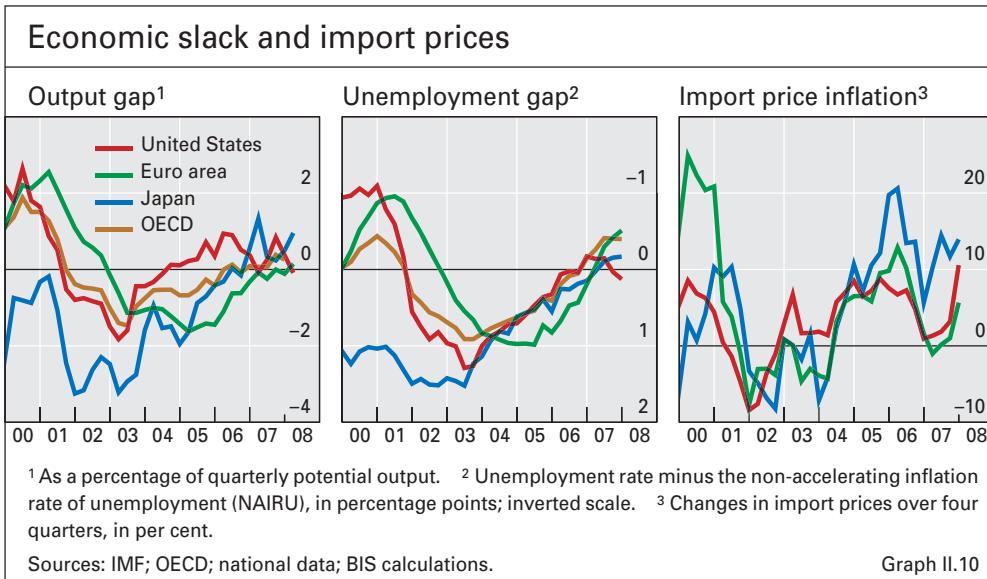
Economic slack in major advanced industrial economies is expected to rise ...

In view of the underlying forces at this juncture, does it seem more likely that core inflation will rise towards headline inflation, or the reverse? Output in many advanced industrial economies appears to have remained around potential, and may even fall below that in the future (Graph II.10). Measures of the unemployment gap suggest rising economic slack in the United States. In other advanced industrial economies, although unemployment rates are still low, softer demand conditions could reduce employment in the future. On balance, demand pressures on core inflation should therefore continue to be muted.

Likewise, recent developments in unit labour costs in the G3 economies have been benign. In the United States, the year-on-year growth rate in unit labour costs fell back to 0.2% in the first quarter of 2008, a break from the upward trend which had taken it above 4% in the first half of 2007. In the euro area, although the growth in unit labour costs has been subdued and stable at close to 1½% in recent years, it rose to about 2% in the fourth quarter of 2007. In Japan, unit labour costs have fallen in the past several years, partly reflecting falling or only slowly growing nominal wages.

Future movements in unit labour costs will depend significantly on the behaviour of wages. Several advanced industrial economies have experienced a reduction in the share of wages in total value added since the 1980s, with a corresponding rise in the share of profits. However, there has recently been demand for higher wages, especially in Europe. In Germany, for instance,

... and unit labour costs are unlikely to pose a major threat ...



following a long period of weak or falling real wages, unions have demanded larger wage increases this year. A one-time adjustment in wages, after a period of significant productivity growth, need not prove to be inflationary, being potentially offset by a fall in profit margins to earlier levels. But a sustained rise in wages could create significant inflation risks by encouraging firms to revise their prices upwards.

Another question regarding the evolution of inflation is how far downward inflation pressures from globalisation might be decreasing or even reversing. One factor has been the recent sustained demand for commodities, led by strong growth in emerging market economies. At the global level, this seems to be heightening resource constraints, raising prices of key raw materials and food articles.

A second factor is that real wages have been rising rapidly in some countries with low-cost production structures such as China, partly reflecting a shortage of skilled labour and increased minimum wages (see Chapter III). This has tended to push up the prices of manufactured goods imported from emerging economies. These recent developments suggest that the "catching-up" of emerging market economies is likely to involve sustained upward pressures on import prices. A country-specific factor that may have exacerbated some of these price effects, especially in the United States and the United Kingdom, is the substantial depreciation of the real exchange rate in recent months.

There is as yet no solid evidence to indicate that the substantial decline in the pass-through of changes in commodity prices and exchange rates to import and consumer prices observed during the 1990s and early 2000s has reversed in more recent years (Table II.3; see also Table II.2 in the *75th Annual Report*). The degree of pass-through continues to be lower than that seen during the 1970s and 1980s. This is partly because foreign exporters have been able to keep prices unchanged in importers' local currencies, either by adjusting their profit margins and those of local distributors, or by finding ways to increase

... but  
disinflationary  
pressures from  
globalisation are  
decreasing

Cost pass-through  
still appears to be  
low ...

Inflation pass-through						
	From commodity prices to import prices <sup>1</sup>		From exchange rates to import prices <sup>1</sup>		From import prices to core CPI <sup>2</sup>	
	1971–89	1990–2007	1971–89	1990–2007	1971–89	1990–2007
United States	0.29 **	0.22 **	0.47 **	0.16 *	0.33 **	0.14
Japan	0.35 **	0.27 **	0.74 **	0.40 **	0.23 **	0.02
Germany	0.22 **	0.17 **	0.37 **	0.23 **	0.17 **	-0.07
France	0.19 **	0.10 **	0.77 **	0.03	0.27 **	-0.08
United Kingdom	0.20 **	0.12 **	0.68 **	0.46 **	0.25 *	0.14
Italy	0.31 **	0.25 **	0.66 **	0.41 **	0.32 **	0.49

\*\* and \* indicate that the figures are significantly different from zero at the 99% and 95% confidence levels respectively.

<sup>1</sup> Changes, in per cent, in import prices in response to a 1% increase in commodity prices (measured in domestic currency), or in response to a 1% depreciation in the nominal effective exchange rate.

<sup>2</sup> Changes, in per cent, in core consumer prices in response to a 1% increase in import prices.

Sources: BIS estimates based on data from OECD, Hamburg Institute of International Economics (HWWI) and national agencies. Table II.3

productivity commensurately. It would also seem to imply that long-term inflation expectations have remained anchored.

Nevertheless, the degree of pass-through could increase. Outside the United States, margins built up by exporters during the period of dollar appreciation have now been run down significantly, and productivity gains could prove increasingly difficult to obtain. Moreover, large and persistent rises in commodity prices or exchange rate depreciation might eventually cause inflation expectations to shift upwards. This could trigger larger adjustments in core consumer prices going forward.

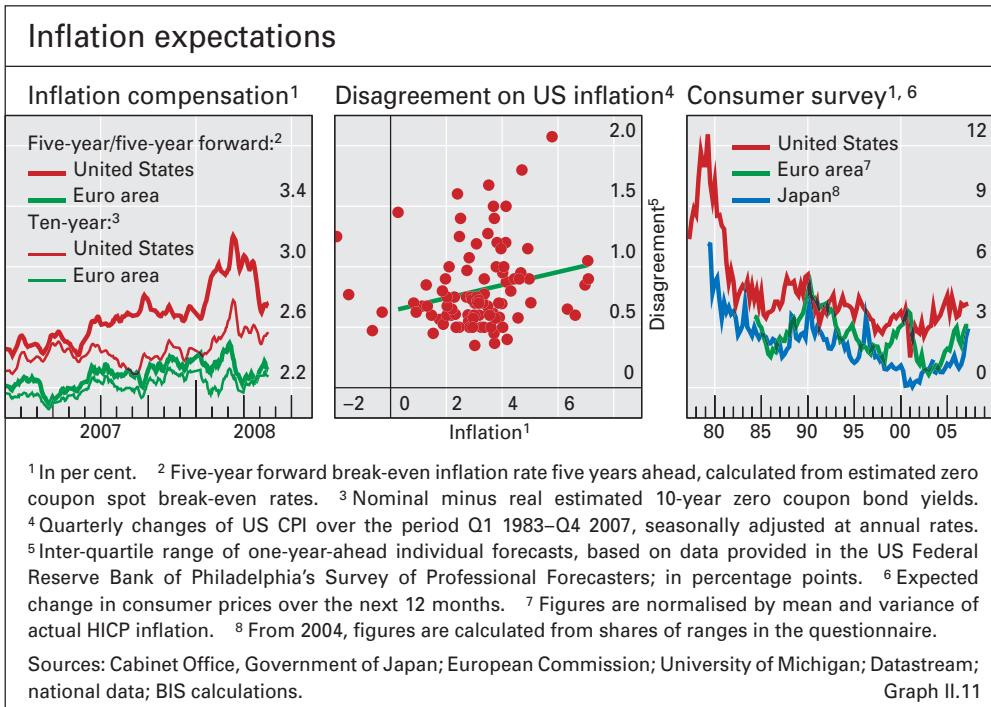
Inflation expectations in this context are likely to play a major role. Following a decline over much of 2006, long-term market-based measures of inflation expectations (starting five years hence) moved up in major advanced industrial economies in 2007 (Graph II.11), though they fell back somewhat in early 2008. The increase was particularly marked in the United States, where higher inflation levels have also been associated with increased dispersion of inflation expectations among professional forecasters. Yet the extent to which bond prices provide an accurate picture of inflation expectations in current circumstances remains unclear. For instance, sizeable liquidity effects seen in government bond markets during the recent episodes of market stress might have played a role in the volatility of measured inflation expectations. A rise in inflation risk premia (rather than expectations of future inflation) may have been an additional contributing factor, although this appears more probable for the euro area than for the United States (see Chapter VI). The possibility that inflation expectations have begun to move up is also supported by other evidence. Although short-term inflation expectations, as measured by household surveys, have generally remained below 1980s levels, they have trended up over the past year in the major advanced industrial economies.

An important question for monetary policy is how well anchored inflation expectations are likely to be in the face of adverse shocks to inflation. On the

... but could rise  
in future

Long-term inflation  
expectations have  
risen recently ...

... and could  
become less well  
anchored



one hand, it could be that inflation expectations are forward-looking and have become better anchored over the past decade due to greater monetary policy credibility. On the other hand, it could be that expectations are primarily backward-looking, for example, based on learning by private agents. In this case, expectations could have been contained by the earlier favourable trend in inflation, not least as an increase in the effective labour supply globally held down the prices of manufactured goods. The simple fact that long-term inflation expectations have apparently remained well anchored over the past few years does not provide a decisive indication of whether, and how strongly, these expectations might be reversed, nor what could trigger such a reversal.

To the extent that inflation expectations are backward-looking, the recent trend increase in food and energy prices could well have particularly adverse consequences for inflation expectations. There is some anecdotal evidence that large price changes in a few “visible” items purchased more widely and frequently (eg bread, meat, milk and petrol) are more likely to lift public perceptions of inflation than price changes in items bought more intermittently. In the euro area, surveys indicate that “perceived” inflation increased in late 2007, coinciding with a rise in food prices. In the United Kingdom, there is also evidence that consumers’ inflation perceptions tend to be more highly correlated with the inflation rates for items bought at least quarterly.

A rise in prices of frequently purchased goods highlights this risk

## Balance sheet vulnerabilities, credit tightening and headwinds

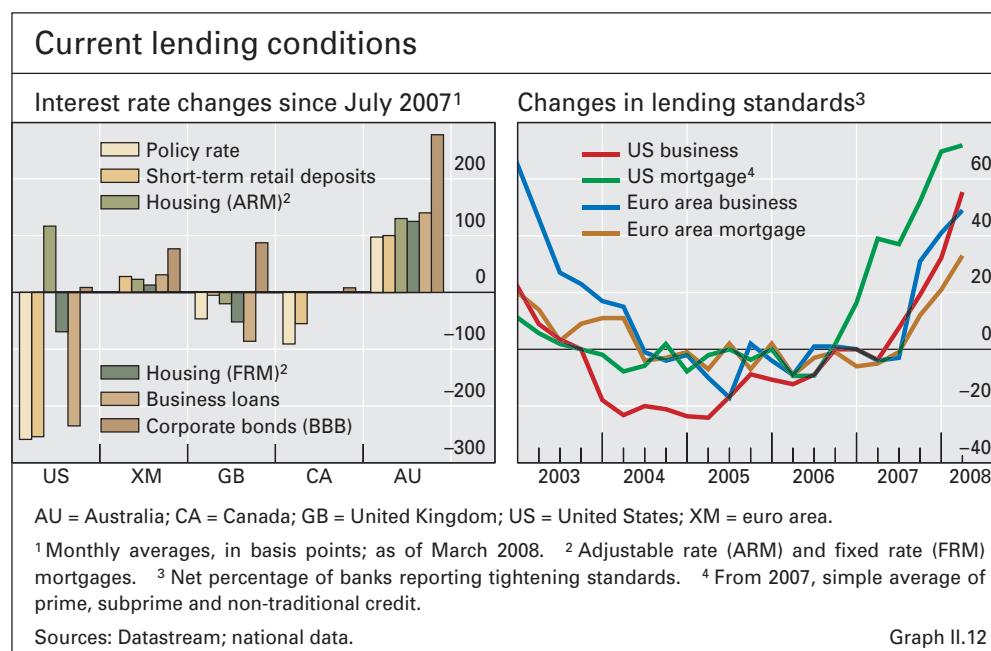
Prospects for the advanced industrial economies depend heavily on how recent financial shocks interact with the balance sheet positions of households and

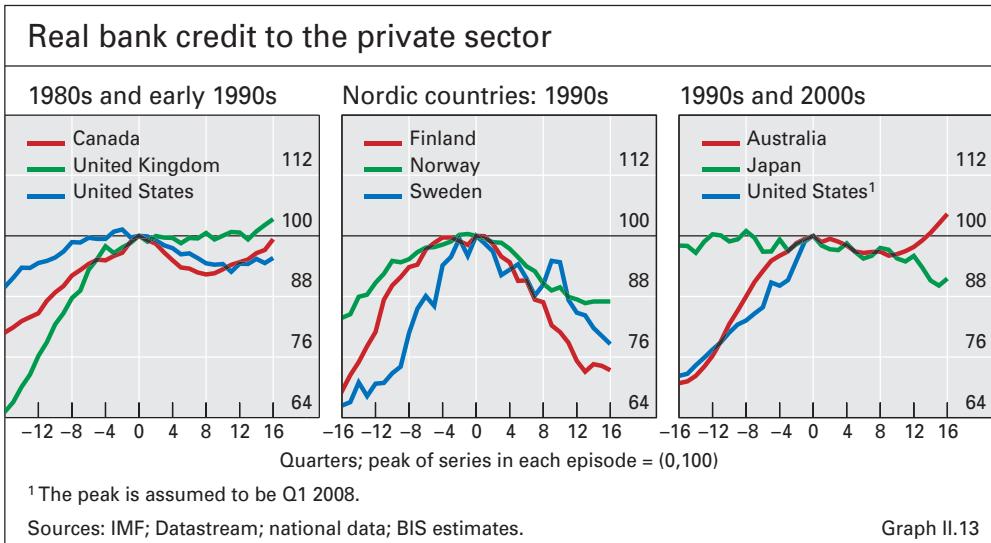
Tighter credit conditions in major economies ...

firms and their associated spending decisions. The turmoil has already led to a tightening of credit conditions through a rise in spreads on bank lending (Graph II.12). Admittedly, in the case of the United States (and to a lesser extent Canada and the United Kingdom), lower policy rates have, to various degrees, offset wider credit spreads. Nevertheless, in all of these countries, credit conditions have tightened as banks have raised non-price lending standards for their borrowers. In the United States, the net proportion of banks reporting tightening lending standards for most types of loans was as high by the first quarter of 2008 as during the recessions of the early 1990s and early 2000s. Australia, Canada and the United Kingdom have also seen a tightening of credit standards in some or most sectors. In the euro area, credit standards have been tightened sharply for business credit, nearing the levels seen during the credit market downturn of the early 2000s, and significantly for households.

... have historically had a major macroeconomic impact ...

The recent tightening of credit markets has taken place against the backdrop of very large increases in debt, particularly of US households. If past episodes of credit market crises are any guide, the macroeconomic impact of this tightening is likely to be considerable. The 1989–92 US credit crunch was, for instance, seen to have aggravated the recession in 1990. That credit crisis occurred in the aftermath of the savings and loan crisis in the 1980s, a period when banks greatly increased their exposure to the commercial real estate sector. Following the pre-crisis peak, real bank credit to the US private sector contracted for a lengthy period (Graph II.13). The credit downturn was milder and the recovery was quicker in other countries, such as the United Kingdom, that were experiencing difficulties in the banking sector around the same period. There are other cases, however, such as the Nordic banking crises of the early 1990s, where the cutback in credit was more severe. In Sweden, for instance, the result was a sharp decline in household spending, and the





share of residential investment in GNP fell from a peak of 6½% in 1991 to 1½% in 1995.

In each of these crises, the ultimate impact was aggravated by the interaction of an adverse economic cycle with large declines in asset prices, and a sharp deterioration in the creditworthiness of borrowers. In particular, as discussed in Chapter VII, the credit cycle was associated with a property price cycle, which had a large impact on the value of collateral and aggregate spending, both in the upswing and in the downswing. In the current credit cycle, significant balance sheet exposures in several countries pose risks to the macroeconomic outlook.

... when combined with an adverse business and asset price cycle

#### *Vulnerability of households*

The impact of a given change in credit standards might be expected to be largest for the United States, where household financial problems are arguably most severe. A rapid increase in household debt since 2002 had made it possible for households to maintain consumption and residential investment at higher levels than would have been feasible based on their income alone (Table II.4). This increase in debt was enabled largely by strongly rising house prices, which reduced collateral constraints for households that would otherwise have been unable to borrow as much, or at all. Households in the United States were also able to use proceeds from home sales, cash-out refinancing and home equity loans to extract their rising home equity: some private estimates suggest that home equity extraction financed on average about 3% of personal consumption (including repayment of non-mortgage debts) from 2001 to 2005.

US households seem most exposed ...

One source of vulnerability is the combination of low savings and high household debt. While the ratio of US household saving to disposable income started declining from about 7½% in 1992, it fell particularly sharply during the early 2000s to almost zero by 2005. A significant rise in debt service payments during this period, to over 14% of disposable income by 2007, made households more exposed to income and interest rate shocks. Household

... because of high debt levels ...

Non-financial sector funding, outlays and balance sheet ratios						
	United States		Euro area		United Kingdom	
	1998–2002	2003–07	1999–2002	2003–07	1998–2002	2003–07
Non-financial corporate sector						
Investment	8.2	7.1	11.2	11.0	10.5	9.2
Internal funds	7.6	7.6	8.2	7.7	10.7	10.1
Net borrowing from intermediaries	0.6	1.1	2.6	3.7	6.9	10.2
Net debt securities issuance	2.2	1.3	0.9	0.4	3.1	1.1
Net equity issuance	-1.1	-3.0	4.8	2.7	8.6	1.4
Debt outstanding	45.5	43.7	76.3	85.3	83.6	108.7
Household sector						
Disposable income	73.5	73.7	66.3	65.8	68.9	67.0
Final consumption expenditure	68.7	70.1	57.5	57.1	62.5	61.5
Residential investment	3.9	4.7	5.4	5.7	3.0	3.9
Mortgage debt outstanding	50.7	70.4	28.3	35.4	56.9	76.5
Total debt outstanding	76.7	97.6	48.5	56.6	72.0	94.3
Financial assets	330.6	320.2	186.5	191.7	305.2	280.8
<i>Memo: Housing equity</i> <sup>1</sup>	57.0	51.6	84.9 <sup>2</sup>	87.7 <sup>2,3</sup>	72.0	72.2 <sup>3</sup>

<sup>1</sup> Excess of housing assets over housing debt as a percentage of total housing assets. <sup>2</sup> France only; household non-financial assets are used as a proxy of housing assets. <sup>3</sup> 2003–06.

Sources: OECD; Eurostat; Datastream; national data.

Table II.4

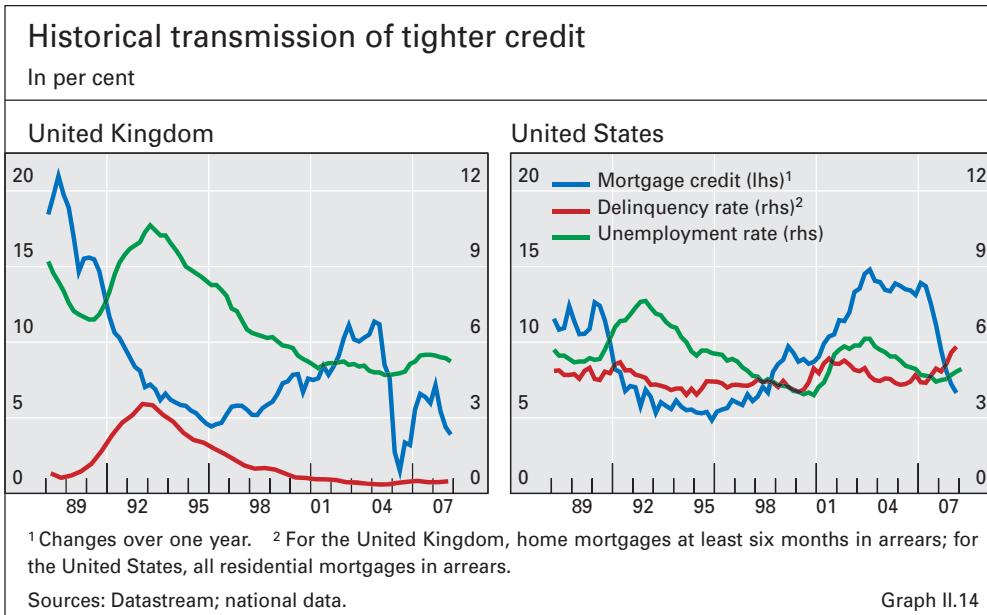
spending now seems likely to weaken, in response to high debt and debt service burdens, falling employment and the general tightening of credit conditions.

... and lower house prices ...

A second source of vulnerability stems from large actual and expected declines in housing prices and wealth, reducing households' prospective net worth and hence their capacity to borrow to sustain current spending. US households' equity in the overall housing stock – the difference between their total housing assets and housing debt – has in fact already declined noticeably of late. Indeed, some estimates indicate that the share of US households with negative equity is already larger than the peak seen during the UK housing downturn in the early 1990s.

... as well as risky borrowing

A third source of vulnerability arises from the fact that subprime, stated-income and other risky non-standard mortgage products accounted for much larger shares of US mortgage lending during the upswing than was the case in other advanced industrial economies. As housing prices fall and credit conditions tighten, such loans are more likely to default because the borrowers have few alternative financial resources with which to cushion an income fall or to delay foreclosure proceedings, leading to even tighter lending conditions and more restraints on spending. In addition, very lax underwriting processes meant that many borrowers were able to take on loans they could not afford even in the short term, perhaps on the assumption that they could refinance as housing prices rose. This might explain why delinquency rates in the United States on this occasion started rising long before unemployment; in earlier episodes in both the United States and the United Kingdom, delinquency and unemployment rates moved more or less in tandem (Graph II.14).



Household indebtedness has also increased sharply in the United Kingdom. But less of the debt accumulation has been used to finance consumption, which has actually fallen as a percentage of GDP (Table II.4). Housing equity relative to assets has stopped rising with slowing or falling house prices. While current estimates suggest that very few households have negative equity, much will depend on how far house prices fall in the future. First-time home buyers, generally highly leveraged and with a significantly higher debt service burden, could be more exposed than others. Although mortgage lending standards did not become quite as relaxed in the United Kingdom as in the United States, they still eased considerably, with high initial loan-to-value ratios becoming more common until recently (Graph II.6).

In the euro area, by contrast, the aggregate household balance sheet position remains strong, thanks to a steady rise in measured wealth and only a modest increase in debt. The absence of a generalised housing boom, a relatively large concentration of household financial assets in fixed income instruments and greater use of fixed rate mortgages appear to have contained household financial vulnerability during the current market turmoil. Moreover, at around 3%, the average interest payment burden on euro area households remains significantly below that in other major advanced industrial economies.

Even so, there has been considerable divergence within the euro area. In several countries, household debt has risen well above the euro area average of about 60% of GDP. Debt ratios stood at more than 120% of GDP in the Netherlands and between 80 and 90% in Portugal and Spain at the end of 2006. Credit standards also appear to have been eased in several cases during the housing market upswing, with the typical loan-to-value ratio in Spain, for instance, exceeding that in Canada and the United Kingdom. Given the high concentration of their wealth in housing assets, households in some countries

Vulnerabilities appear more contained in the United Kingdom ...

... and even more so in the euro area

appear more vulnerable to tighter credit market conditions, especially if these lead to large declines in house prices.

#### *Possible impact on non-financial firms*

Effects on the business sector depend on: the need for external funding;

The impact of tighter credit standards on the business sector will depend on how far firms rely on external financing rather than internally generated resources. In fact, non-financial businesses across the major advanced industrial economies have improved their balance sheet positions since the beginning of the decade. Their ability to fund investment from internal resources remains high. In the United States, retained earnings have in recent years been sufficient to cover gross investment spending; in one sense, firms have only needed to borrow to fund equity buybacks. Similarly, internal funds have broadly covered gross investment in the United Kingdom. Whether this implies that firms are well placed to cushion the impact of tightening credit conditions on the economy will depend on how much profits weaken as the economy turns down, whether firms can reduce dividend payments to sustain large internally generated surpluses, and the nature of the external credit available.

One feature of the current episode of credit market tightening is that leveraged loans, which had expanded sharply before the turmoil, dried up more than on-balance sheet lending (see Chapter VII). Since leveraged loans were primarily used to fund mergers and acquisitions, it should be expected that this activity will be more affected than investment in physical capital. Nevertheless, the previous boom in the leveraged loan market also boosted stock prices, implying that firms are now less likely to have access to cheaper equity financing as merger and acquisition activity slows.

Borrowing from intermediaries represents a relatively large share of the funding for investment in the euro area across the whole non-financial corporate sector. Investment is thus likely to be more sensitive to a contraction in intermediated credit supply in these economies than in the United States. Smaller firms would be affected most, because of their limited access to alternative financing. How far large firms might be able to cushion the effects of a contraction in credit supply through capital markets remains uncertain. Such firms in the United States would be more constrained by disruptions in corporate debt markets than in the euro area.

Within the business sector, tighter credit conditions are more likely to be binding for commercial real estate firms than for others. Compared with other kinds of commercial lending, leverage against collateral is generally higher for this type of borrower, and lending conditions had eased much more than for other firms. The tightening in credit conditions reported by US banks has been particularly sharp in this sector, and growth in business mortgage debt is already slowing.

In addition, the decline in land prices implied by falling house prices has also affected the value of non-residential property in the United States (see Chapter VII), and therefore collateral values in turn. The demand for commercial building related to residential construction (eg shopping centres) is likely to fall. Such dynamics are also likely to affect the commercial real estate sector in other countries.

the reliance on specific sources of funding;

and the kind of borrowing, with commercial real estate especially vulnerable ...

... because of its sensitivity to collateral values

In sum, the current combination of sizeable shocks – the difficulties of major banks, credit market tightening, asset price declines and the unexpected strength of commodity prices – has created much uncertainty about the central forecast of continued, albeit more moderate, global growth in 2008. The extent to which households with overstretched balance sheets, in the United States and some other advanced industrial economies, will have to retrench in the face of such shocks is hard to predict. While a substantial rise in US household saving could bring about a further sizeable reduction in the US current account deficit, it would do so at the price of weakening demand in the rest of the world. At the same time, inflation risks are greater than they have been for many years. If inflation risks do not quickly subside as growth weakens, the stance of monetary and fiscal policy will need to be reviewed.

To conclude, global economic prospects are highly uncertain at present

### III. Emerging market economies

#### Highlights

Uncertainties about the prospects for the emerging market economies (EMEs) deepened during the period under review. Although growth in EMEs last year once again significantly exceeded that in the rest of the world, the potential knock-on effects of financial market turmoil in the major centres increased the risk of a slowdown in EMEs. In line with this, equity prices in many emerging markets, which rose strongly for much of 2007, weakened in the early part of 2008, suggesting lower growth expectations. At the same time, further steep increases in oil and food prices added to inflationary pressures. As in the advanced industrial economies, these conflicting forces have created a major dilemma for monetary policy. A further complication is that many countries are still resisting currency appreciation. Moreover, with the fall in US rates, interest rate differentials over dollar rates have widened. This has attracted additional capital inflows, making the task of monetary tightening in the face of rising inflation more difficult.

Developments in the advanced industrial economies could also pose major challenges. First, a pronounced slowdown in the United States would hurt the EMEs, which, though remarkably resilient so far, still depend significantly on external demand. Second, tighter conditions in global financial markets could constrain EMEs with large current account deficits and those relying on cross-border bank borrowing.

#### Macroeconomic developments

Robust growth ...

Growth in the EMEs as a whole was 7.7% in 2007, above the already rapid average pace of 7% recorded during 2003–06 (Table III.1). Current projections envisage growth of around 6.7% in 2008, notwithstanding the sharp slowdown in the industrial world foreseen in the consensus forecast.

... with downside risks

Continuing the pattern of recent years, the key driver of economic growth in all EME regions continues to be domestic demand, reflecting strong private consumption and investment spending (Graph III.1). Net exports have also made positive contributions to growth in China and other emerging Asia, but negative contributions in Latin America. How far growth in the emerging economies will be supported by robust domestic demand in the context of a US slowdown is a key question that will be addressed later in the chapter. In brief, risks to growth for EMEs are on the downside.

Rising inflation in breach of targets

With growth strong, CPI inflation rose sharply in the course of the past year in all major EME regions (Graph III.2). The pickup in inflation, which was particularly apparent in the second half of 2007, was greatest in Asia (with

## Output growth, inflation and current account balance

	Real GDP <sup>1</sup>			Consumer prices <sup>1</sup>			Current account balance <sup>2</sup>		
	2003–06	2007	2008	2003–06	2007	2008	2003–06	2007	2008
Total EMEs	7.0	7.7	6.7	5.4	5.5	7.0	439	788	803
Emerging Asia	8.4	9.2	7.9	3.3	4.2	5.8	238	522	457
China	10.5	11.9	10.0	2.1	4.8	6.3	131	372	348
India <sup>3</sup>	8.9	8.7	7.7	5.5	4.6	6.0	-2	-15	-23
Other Asia <sup>4</sup>	5.2	5.8	4.9	3.7	3.0	5.0	109	166	132
Latin America	4.5	5.6	4.5	6.3	6.1	6.6	32	27	-10
Brazil	3.4	5.4	4.8	6.4	4.5	5.1	11	3	-22
Mexico	3.4	3.2	2.6	4.1	3.8	4.2	-6	-7	-11
Other Latin America <sup>5</sup>	6.9	7.9	5.9	8.1	10.0	10.6	27	31	23
Emerging Europe	6.1	5.6	4.6	7.3	5.6	7.1	-64	-119	-146
Poland	4.8	6.5	5.3	1.9	2.4	4.2	-8	-16	-24
Turkey	7.5	4.5	4.0	14.0	8.8	9.7	-20	-38	-45
Other emerging Europe <sup>6</sup>	5.7	5.9	4.8	5.0	5.0	6.7	-37	-65	-78
Russia	7.1	8.1	7.3	11.7	9.0	12.3	69	80	81
Africa <sup>7</sup>	5.9	6.3	6.3	7.1	6.3	7.5	11	2	22
South Africa	4.6	5.1	4.1	3.8	7.1	8.5	-9	-21	-21
Middle East <sup>7</sup>	6.1	5.8	6.1	6.6	10.4	11.5	151	275	398
<i>Memo: G7</i>	2.4	2.3	1.4	2.1	2.1	3.0	-478	-457	-433

Estimates for 2008 are based mainly on May consensus forecasts, except for emerging Europe and Russia. Forecasts for Africa and the Middle East are from the IMF.

<sup>1</sup> Annual changes, in per cent. Total and regional figures are weighted averages based on 2005 GDP and PPP exchange rates.

Average of period, except Latin American inflation figures: end of period. <sup>2</sup> In billions of US dollars. Total and regional figures are the sum of the economies listed. <sup>3</sup> Data are for fiscal years beginning in April; inflation figures refer to wholesale prices.

<sup>4</sup> Hong Kong SAR, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan (China) and Thailand. <sup>5</sup> Argentina, Chile, Colombia, Peru and Venezuela. <sup>6</sup> Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia (FYR), Romania, Slovakia and Slovenia. <sup>7</sup> IMF *World Economic Outlook* regional grouping.

Sources: IMF, *World Economic Outlook*; © Consensus Economics; national data.

Table III.1

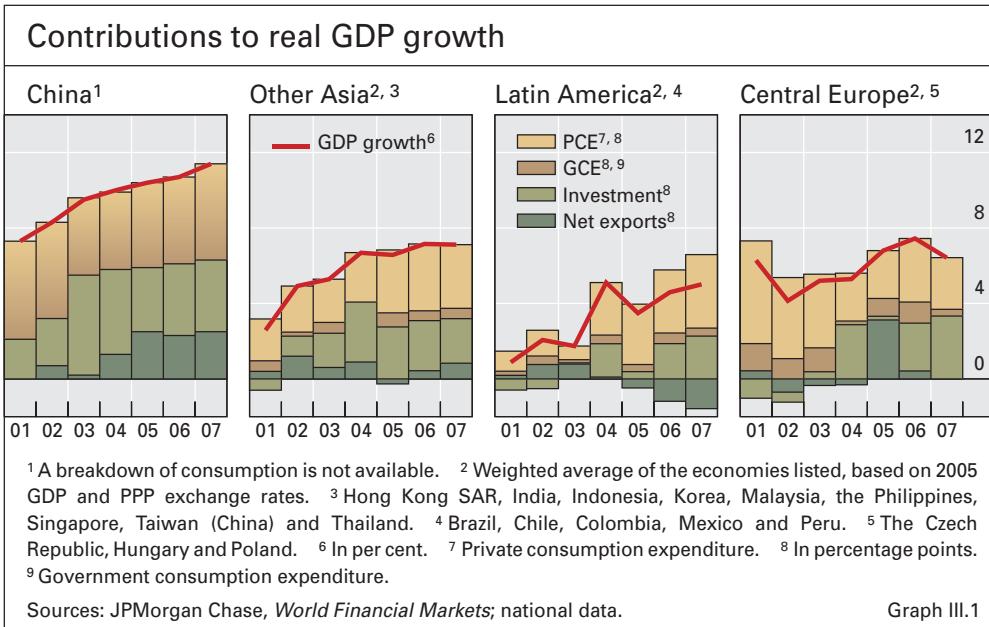
year-on-year inflation accelerating from less than 3% to over 6% between late 2006 and April 2008), followed by Latin America (from 4.1% to 5.7%). Recent increases have brought inflation above formal or informal 2008 targets in 15 out of the 17 largest EMEs that announce such targets, and indeed well above informal targets in China and India. In Korea and Mexico, inflation has recently remained above the inflation target or hovered close to it. Large increases in inflation have also been recorded in many other countries, including Chile, the Czech Republic, Indonesia, the Philippines, Russia, South Africa and Thailand. In Brazil, where inflation has been within the target range, sharp rises in headline inflation (actual and forecast) raised concerns that the midpoint of the target range would be exceeded at the end of 2008.

Inflation forecasts for 2008 rose during 2007 in Asia, Latin America and other emerging markets (Graph III.2), ending an extended period in which such forecasts had generally remained stable. These higher forecasts probably reflect an interaction between rising wage inflation, expectations of further increases in the prices of food and energy, and demand pressures.

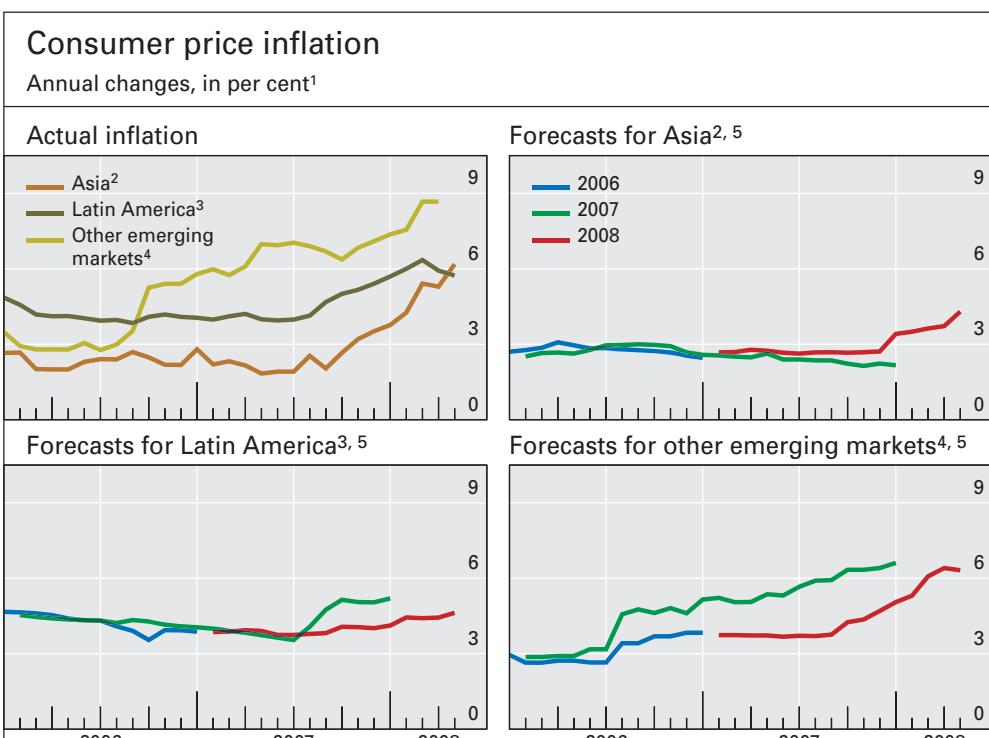
Wage trends in EMEs are hard to assess because of the lack of internationally comparable data. There are, however, signs of more rapid wage

Higher inflation forecasts ...

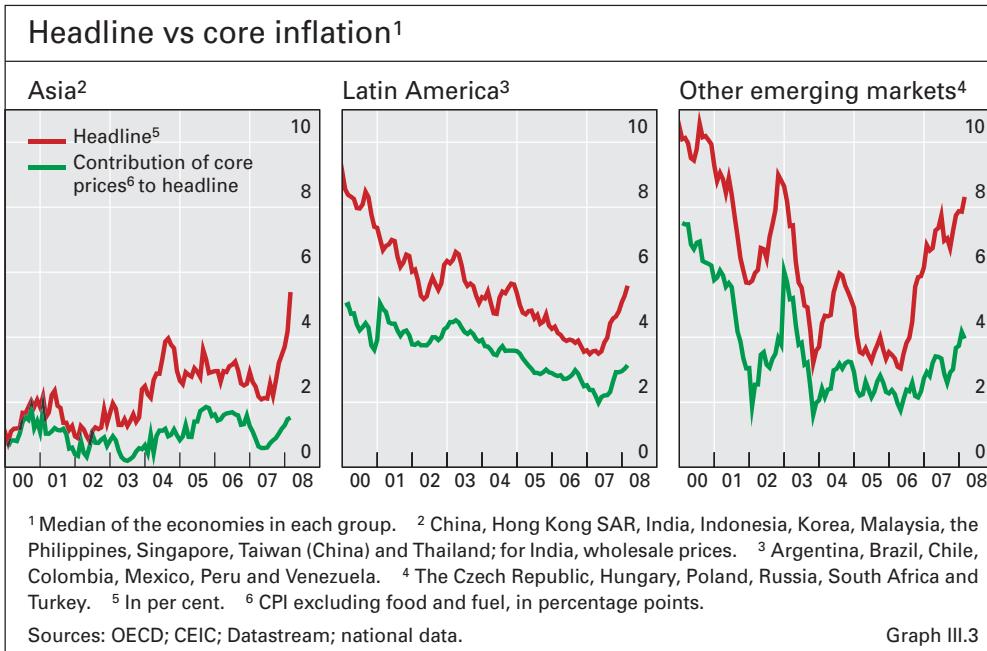
... could reflect wage increases ...



increases in some of the largest EMEs. For example, annual wage growth has been in double digits in China, averaging 14.4% in 2001–06 and rising to 17.7% in the third quarter of 2007. This reflects not only demand pressures feeding into wage claims, but also structural changes, including rising minimum wages and new labour legislation that has strengthened contractual rights for



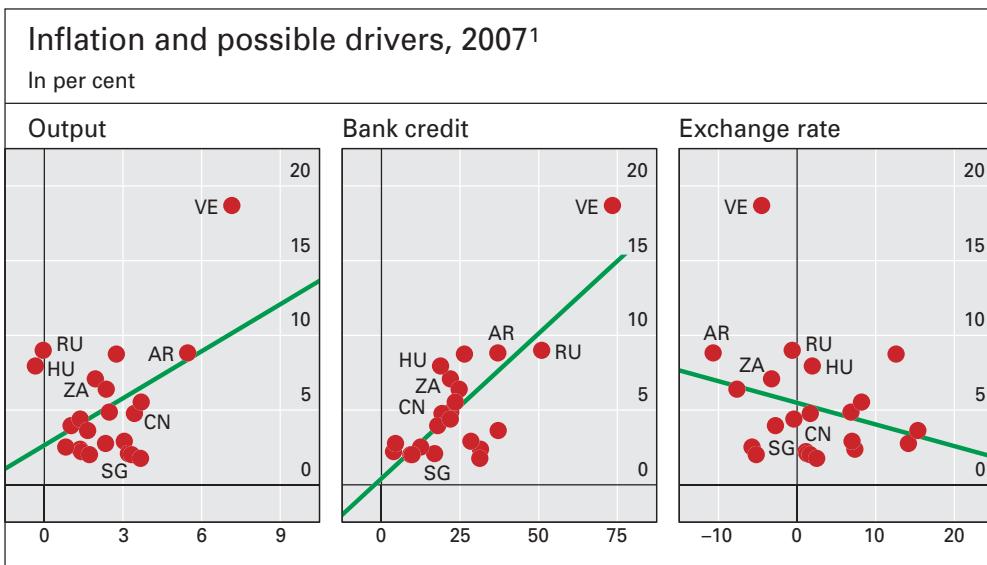
Sources: IMF; © Consensus Economics; national data.      Graph III.2



workers. In India, some private sector surveys indicate double digit increases in private sector salaries in recent years, and large adjustments to the salaries of government employees have also been proposed.

The upward trend in headline inflation may well be expected to persist. One reason is that increases in food and energy prices, which account for much of the rise in headline inflation in many countries, show no consistent signs of abating (see below). Another is that the underlying rate of inflation, as measured by core inflation, has also accelerated (Graph III.3). Core inflation

... expectations that inflation will persist ...



AR = Argentina; CN = China; HU = Hungary; RU = Russia; SG = Singapore; VE = Venezuela; ZA = South Africa. The other economies shown are: Brazil, Chile, Colombia, the Czech Republic, Hong Kong SAR, India, Indonesia, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Thailand and Turkey.

<sup>1</sup> Horizontal axis: deviation of output from the Hodrick-Prescott trend, growth of bank credit and change in the nominal effective exchange rate (increase = appreciation) respectively; vertical axis: CPI (for India, wholesale price) inflation.

Sources: IMF, *International Financial Statistics*; national data; BIS calculations.

Graph III.4

– that is, excluding food and energy prices – rose in all EME regions starting around the second half of 2007, with a median contribution to headline inflation of 2.5 percentage points early in 2008, against a headline inflation figure of 6.3%.

... and demand side pressures

A number of indicators suggest that demand pressures have also played an important role in EME inflation. While simple correlations need to be interpreted with caution, inflation has tended to be higher in countries where the level of real output has been above estimates of trend (Graph III.4, left-hand panel) or where GDP growth has been faster (not shown). Inflation has also tended to be higher in countries with rapid credit growth and where the exchange rate has appreciated by less (Graph III.4, centre and right-hand panels). As discussed below, an easy monetary policy stance and large-scale intervention in foreign exchange markets appear to have contributed to these outcomes.

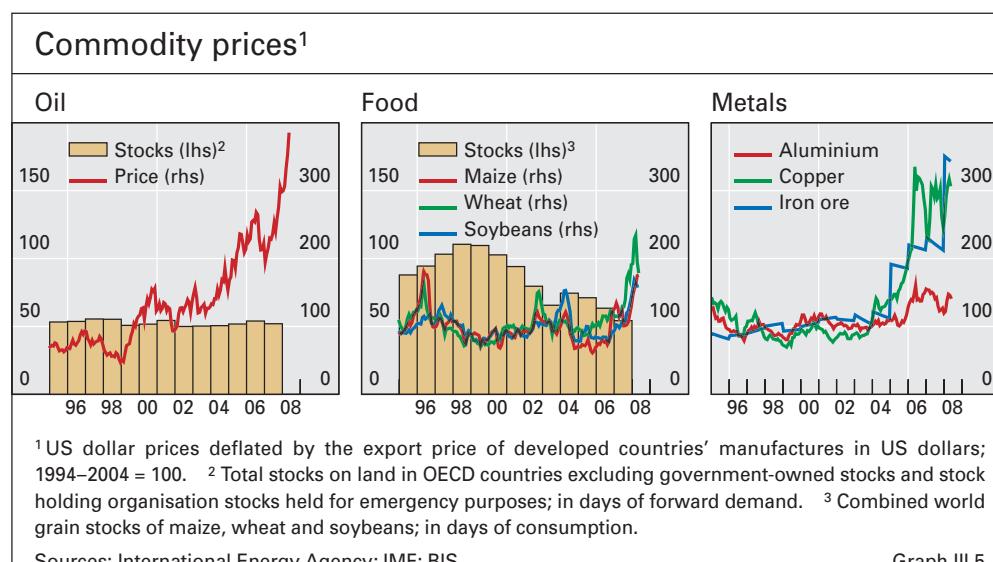
## Commodity price developments

Rising commodity prices ...

Commodity prices have been on an upward trend since early this decade, showing particularly strong increases in the past two years. Rebounding from a temporary low in 2006, nominal US dollar oil prices rose 47% in 2007, and by early May 2008 had risen by a further 29%. Prices of food commodities, such as cereals and oilseeds (but also rice, which is not internationally traded in large volumes), have risen sharply since mid-2006. The performance of metal prices has been more mixed, but pronounced increases in copper and iron ore prices have also been observed (Graph III.5).

... reflecting strong global demand

The extended upswing in the prices of some major commodities in the present decade reflects persistent demand growth that has not been fully accommodated by increases in supply. On the demand side, relatively easy global monetary conditions have supported robust global economic growth. This effect has been reinforced by the US dollar depreciation in recent years, which has contributed to higher commodity prices measured in dollars.



According to a recent IMF estimate, a 1% depreciation in nominal effective terms leads to an oil price increase in US dollars of more than 1% after one year. Another important driver of the demand for commodities has been the very rapid industrialisation of countries outside the OECD area, notably China and, more recently, India. On the supply side, a number of constraints, including delays in the expansion of production capacity and higher production costs, have also played a role.

Some of these effects may be illustrated by developments in oil and food commodity markets. In the case of oil, global demand growth has averaged about 1.6% per year in this decade, but China's demand has grown at an annual average rate of 6.7%. As a result, the share of China in global oil demand now exceeds that of Japan and Korea combined and is approaching that of OECD Pacific countries (Table III.2). The demand for oil in EMEs has been supported by government subsidies, which shield the population from higher prices and encourage the development of certain manufacturing sectors (eg automobiles). In a number of EMEs, including China, India, Indonesia and Malaysia, and in Latin America and the Middle East, governments still subsidise energy consumption at the retail level.

Even as demand has grown, supply constraints in some countries have boosted oil prices, despite increases in OPEC supply. According to current investment plans, Saudi Arabian production capacity is projected to increase from 10.5 million barrels per day (mb/d) in 2005 to 12.5 mb/d in 2009. By contrast, non-OPEC oil supply has been held back by the high costs of increasing capacity. For the four largest private sector oil companies outside OPEC, the cost of developing new oil reserves rose by between 45 and 70% over the period 2003–06. The costs of expanding production capacity for these oil companies are much higher than in Saudi Arabia or the United States. Overall spare capacity in the oil industry fell from around 5 mb/d in 2000 to a low of 1 mb/d in 2005, before recovering to 2.2 mb/d in 2007. Research indicates that low spare capacity contributes to higher oil prices. It limits the scope to increase production in order to offset rising demand pressures or disruptions to supply. It also means that larger oil stocks are required to smooth price fluctuations. However, global oil stocks have broadly remained

Subsidies support  
oil demand ...

... but oil supply is  
constrained

Global oil demand <sup>1</sup>						
	World	North America <sup>2</sup>	OECD Europe <sup>3</sup>	OECD Pacific <sup>4</sup>	China	Rest of the world
1991–2000	1.4	1.4 (30.5)	0.9 (20.2)	1.8 (11.6)	7.6 (6.3)	0.5 (31.3)
2001–07	1.6	1.3 (29.8)	-0.2 (17.8)	-1.1 (9.6)	6.7 (8.8)	2.8 (34.0)

<sup>1</sup> Average annual percentage changes; the figures in parentheses indicate the percentage share of global oil demand at end of period. <sup>2</sup> Canada, Mexico and the United States. <sup>3</sup> Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey and the United Kingdom. <sup>4</sup> Australia, Japan, Korea and New Zealand.

Sources: International Energy Agency; OECD.

Table III.2

Food demand boosted by rapid EME growth

stable since the early 1990s (Graph III.5, left-hand panel). The effects on prices have been exacerbated by geopolitical tensions and lower average oil inventories in some major oil-consuming countries.

In the case of food commodities, rapid GDP growth in EMEs in recent years has played a large role in boosting demand. This effect has been reinforced by structural changes, as rising per capita incomes, notably in China, have increased the demand for cereals, particularly for grain-fed livestock. According to Food and Agriculture Organization estimates, the consumption of cereals per person in developing countries rose by 20% between 1962 and 2003, while that of meat increased threefold. The demand effect on grain prices is amplified because, according to some estimates, two to five times more grain is required to produce the same amount of calories through livestock than through direct grain consumption. Around one third of global grain production was used to feed livestock in 2002. Government policies have also boosted demand for agricultural products. In particular, subsidies for biofuel production have increased the demand for maize and soybeans, which has in turn raised the prices of other food crops by diverting production away from them.

Policies limit food supply

On the supply side, urbanisation has reduced the acreage devoted to farming in some EMEs. Higher oil and gas prices have also raised the cost of both fertiliser and transport. Government policies in advanced industrial economies, including restrictions on agricultural land use to support prices, continue to limit production responses to increased demand. Finally, lower stocks have added to price pressures (Graph III.5, centre panel). Supply constraints have been particularly apparent for wheat, which experienced poor growing conditions in 2006–07, although conditions have recently improved.

Structural factors will support commodity prices

Are high commodity prices likely to persist? In the short run, slower growth in the United States will tend to reverse some of the recent spikes in commodity prices or at least dampen any further increases. However, commodity prices will be supported to the extent that the rapid growth in EMEs, and in particular China, can be sustained. The recent lowering of US interest rates also supports high commodity prices, and this effect will be reinforced if tight credit conditions in global markets eventually ease as expected. Over the medium term, some of the structural demand factors cited earlier, such as the continuing economic transformation of China and India, seem likely to persist. The above-mentioned supply factors and constraints (eg higher costs of agricultural and oil production) also appear likely to influence commodity price setting for some time to come.

## External balances and capital flows

Current account surpluses, except in CEE and South Africa

The EMEs as a whole continued to run a current account surplus and receive net inflows of private capital in 2007. In emerging Asia, there was a further increase in the current account surplus to about 6½% of regional GDP, and in Latin America a slight decline in the surplus to about ¾% of GDP. The surplus of oil exporters in the Middle East remained at about 20% of GDP, while that of Russia fell to less than 6% of GDP. By contrast, in central and eastern Europe (CEE) and South Africa the deficit widened to 6½% and 7¼% of GDP

respectively. The major external surplus regions in EMEs in 2007 thus remained emerging Asia (with a surplus of \$520 billion), the Middle East (\$275 billion) and Russia (\$80 billion), while the major deficit regions were CEE and South Africa, with a combined deficit of \$140 billion (Table III.1).

The effect on EME current account balances of the financial turmoil in advanced industrial economies and a slowing US economy has so far been muted by strong demand from other regions. Buoyant import demand in Europe and the Middle East supported growing surpluses in emerging Asia. Exports from Latin America, Russia and the Middle East benefited from the continued strength of commodity prices. In CEE, robust growth of consumption and investment, partly associated with solid growth in the euro area, boosted imports and helped build capacity for the future expansion of exports.

Global financial turbulence has not yet had any significant impact on private capital flows to EMEs either. Net private capital inflows (ie gross inflows minus gross outflows of private sector foreign direct investment (FDI), portfolio and other capital) increased by over 2 percentage points in emerging Asia for the whole of 2007 (to 3½% of regional GDP); by close to 2¾ percentage points in Latin America (to 2.9% of GDP); and by ¾ percentage point in CEE (to 9% of GDP) (Graph III.6). Thus, the overall macroeconomic pressures potentially stemming from capital inflows remained high in CEE, but more moderate in emerging Asia and Latin America.

Trends in net private capital flows do not capture all information relevant for an analysis of macroeconomic and financial stability; therefore, it is also necessary to look at the size and composition of gross private capital inflows. These inflows continued to increase in 2007, albeit at a more moderate pace than in previous years. In emerging Asia, gross private capital inflows averaged

Muted impact of  
turmoil

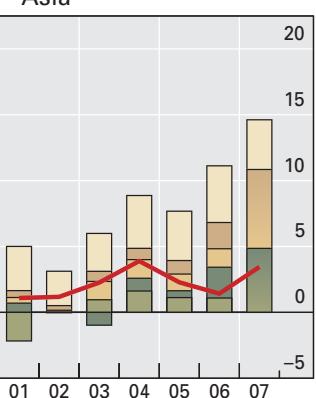
Net private inflows  
increased ...

... and gross private  
inflows remained  
strong

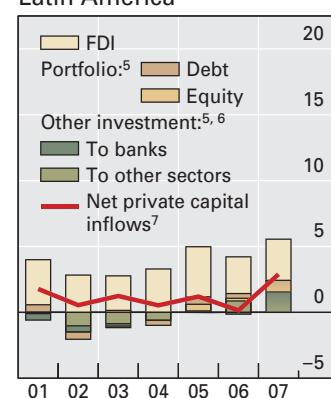
### Composition of gross private capital inflows<sup>1</sup>

As a percentage of GDP

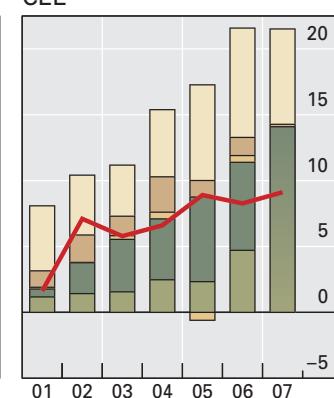
Asia<sup>2</sup>



Latin America<sup>3</sup>



CEE<sup>4</sup>



<sup>1</sup> Gross inflows are simple averages of the economies listed. <sup>2</sup> China, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. <sup>3</sup> Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.

<sup>4</sup> Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Turkey. <sup>5</sup> For 2007, breakdowns of portfolio and other investment are not available. <sup>6</sup> Negative values indicate a decrease in foreign ownership of domestic assets classified under other investment inflows.

<sup>7</sup> Regional totals as a percentage of regional GDP.

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

Graph III.6

nearly 15% of GDP in 2007 (Graph III.6, left-hand panel). This was close to levels seen before the 1997–98 crisis, even though the region is now running a large current account surplus. In Latin America, gross private inflows picked up from about 1% of GDP in 2002 to almost 6% on average in 2007 (Graph III.6, centre panel), close to the historical peaks of the early 1990s. In CEE, opportunities created by accession to the European Union have boosted gross private capital inflows to close to 20% of GDP on average (Graph III.6, right-hand panel), an unprecedented level for EMEs in recent history. As a result, this region now receives around 28% of gross private capital inflows to emerging markets (compared with around 10% in the mid-1990s); Latin America receives around 11% (against 25%); emerging Asia just under 50% (against 63%); and other emerging markets around 11% (against 2%).

FDI share fell while bank inflows boomed

The composition of gross private capital inflows to EMEs has changed over the past five years and now more closely resembles that prevailing in the mid-1990s. The share of FDI in gross inflows dropped to about 40% on average for all emerging market countries in 2007, from 90% in 2002, while the share of portfolio inflows doubled to around 20%. However, the fastest-rising category has been “other” investment inflows to banks and the non-bank private sector. Their share in gross private inflows increased from close to zero in 2002 to over 40% in 2007.

Cross-border bank claims on EMEs increased

For a better insight into these “other” investment inflows, it is useful to look at the BIS locational banking statistics. Cross-border claims of BIS reporting banks on EMEs were estimated at \$2.6 trillion in 2007 (Table III.3), an increase of \$1.6 trillion over the past five years. While emerging Asia and CEE secured the bulk of these inflows, relative to GDP they were much more important in the latter case, with the ratio of cross-border claims to GDP rising to 32%. The CEE countries are thus exposed to significant risks from a possible reversal in bank-intermediated capital flows.

Cross-border and domestic credit in emerging markets						
	Cross-border claims of BIS reporting banks vis-à-vis emerging markets <sup>1</sup>			Domestic credit to the private sector <sup>2</sup>		
	In billions of US dollars		As a percentage of GDP			
	2002	2007	2002	2007	2002	2007
Emerging markets <sup>3</sup>	1,043	2,631	16.6	19.1	50.9	66.4
Claims on banks	647	1,604	10.3	11.6	.	.
Asia <sup>4</sup>	604	1,374	18.6	20.6	97.9	95.2
Claims on banks	486	1,010	14.9	15.1	.	.
Latin America <sup>5</sup>	233	350	15.1	11.1	32.2	39.5
Claims on banks	77	137	5.0	4.3	.	.
CEE <sup>6</sup>	121	599	16.5	32.2	25.7	54.7
Claims on banks	49	299	6.7	16.1	.	.

<sup>1</sup> External positions of reporting banks vis-à-vis individual countries on a residence basis; amounts outstanding. GDP data are IMF-WEO estimates. <sup>2</sup> The economies cited excluding Colombia, Israel, Peru and Venezuela. <sup>3</sup> The economies cited plus Israel, Russia, Saudi Arabia and South Africa. <sup>4</sup> China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. <sup>5</sup> Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. <sup>6</sup> Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and Turkey.

Sources: IMF; national data; BIS locational banking statistics.

Table III.3

At the same time as gross private inflows have risen, gross private outflows surpassed previous historical peaks in 2007, ranging from around 4½% of GDP on average in Latin America to over 14% of GDP in emerging Asia (Graph III.7). This surge in gross private capital outflows has been due mostly to purchases of foreign debt securities, particularly by emerging Asia, and outward FDI, which rose significantly in all three regions in 2007. Private capital outflows have also become more evenly distributed across categories. The share of FDI in gross outflows increased to 25% on average for all emerging market countries in 2007, from under 20% in 2002; that of portfolio outflows increased to over 40% (from 30%); and the share of other investment outflows decreased to 35% (from over 50%).

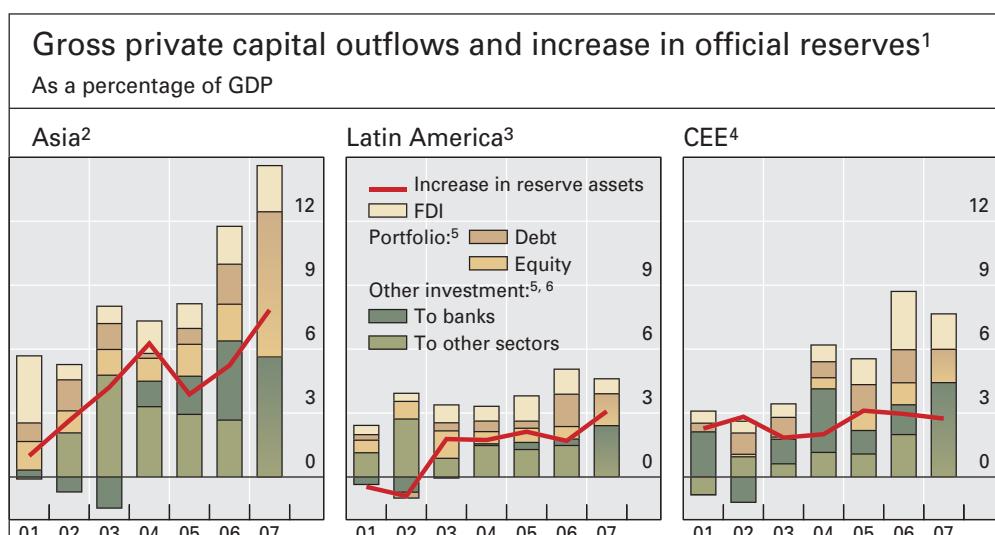
Gross private capital outflows surged ...

Gross private outflows from EMEs for the purchase of debt securities have increased by almost 1% of GDP per year on average since 2002. Private investors from Asia, and China in particular, accounted for about three quarters of these outflows. One notable feature is that a large share of these “private” investors are actually state-controlled entities. For example, in China such investors include large commercial banks which, while classified as private investors in official statistics, are majority state-owned.

... particularly in Asia

In a number of EMEs, sovereign wealth funds are also large institutional investors abroad, and their importance has increased in the recent past. However, relatively little is known about some funds (especially the largest ones), and estimates of their growth and overall size vary widely. Moreover, it is not clear how these funds are classified in official statistics – as official or private investors. During 2007 and early 2008, sovereign wealth funds from China, Singapore and several Middle East countries made commitments to invest around \$80 billion to recapitalise troubled financial institutions from Europe and the United States. If all sovereign wealth fund assets from

Sovereign wealth funds important



<sup>1</sup> Simple averages of the economies listed. <sup>2</sup> China, India, Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. <sup>3</sup> Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. <sup>4</sup> Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Turkey.

<sup>5</sup> For 2007, breakdowns of portfolio and other investment are not available. <sup>6</sup> Negative values indicate a decrease in domestic ownership of foreign assets classified under other investment outflows.

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

Graph III.7

emerging markets – estimated at close to \$2 trillion in 2007 – were invested abroad, they would account for almost 25% of foreign assets held by the public and private sectors (or 40% of foreign assets held by the private sector only) of emerging market countries in 2007.

Increase in foreign reserves

The increase in (notionally) *private* capital outflows into debt securities has come on top of substantial *official* capital outflows in the form of increases in foreign exchange reserves. In emerging Asia, official reserves have risen by an average of 4–6% of GDP annually in recent years (Graph III.7, left-hand panel), and in Latin America and CEE by 2–3% of GDP per year (centre and right-hand panels).

## Policy responses

Faced with the conflicting risks of a global slowdown and rising inflation, as well as unwelcome pressure on exchange rates from large foreign currency inflows, policymakers in EMEs have had recourse to various policy instruments – adjusting interest rates, intervening in foreign exchange markets, changing capital account regulations, adjusting fiscal policy and tightening prudential regulations. Many of these choices have involved difficult trade-offs.

Moderate rise in policy rates ...

Reflecting these conflicting risks, the response of EME monetary authorities to higher inflation pressures has been quite diverse. Between mid-2007 and early 2008, median policy or short-term interbank rates rose in Latin America (by 50 basis points). Rates also rose in central Europe, South Africa and Russia, but fell in Turkey. In emerging Asia rates fell overall (Graph III.8, left-hand panel), as a result of lower policy or short-term rates in Hong Kong SAR, Indonesia and the Philippines. Furthermore, while the People's Bank of China raised one-year bank deposit and loan rates in 2007, short-term interbank rates remained relatively low. More recently, rising inflation pressures have led to rate increases in a number of EMEs.

... has led to declining real rates

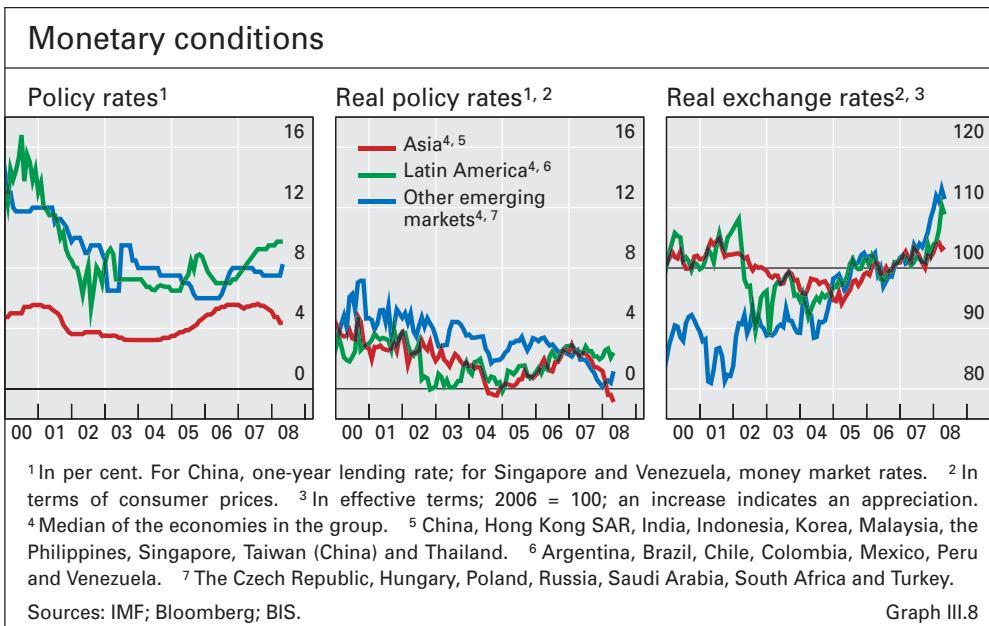
There having been only limited increases in nominal policy rates, real policy or short-term rates have declined to around zero in Asia, and have also fallen in other emerging markets (Graph III.8, centre panel). The reluctance of many EMEs to raise policy interest rates more aggressively has been due in part to worries that higher policy rates would attract greater capital inflows and so accentuate pressures for currency appreciation. However, real exchange rates have appreciated significantly in many EMEs, countering the easing of monetary conditions caused by low real interest rates (Graph III.8, right-hand panel).

Large forex intervention ...

Concerns about appreciation pressures have also led to substantial and prolonged intervention in foreign exchange markets, as evidenced in rising foreign reserves. Foreign reserves of EMEs grew by over \$1 trillion in 2007 (compared to \$620 billion in 2006) to reach over \$4 trillion at the end of the year, and they continued to rise rapidly in the early months of 2008. There were sizeable increases in foreign reserves in many EMEs, including Brazil, China, India and Russia among others (Graph III.9, left-hand panel; see also Chapter V).

... affects bank balance sheets ...

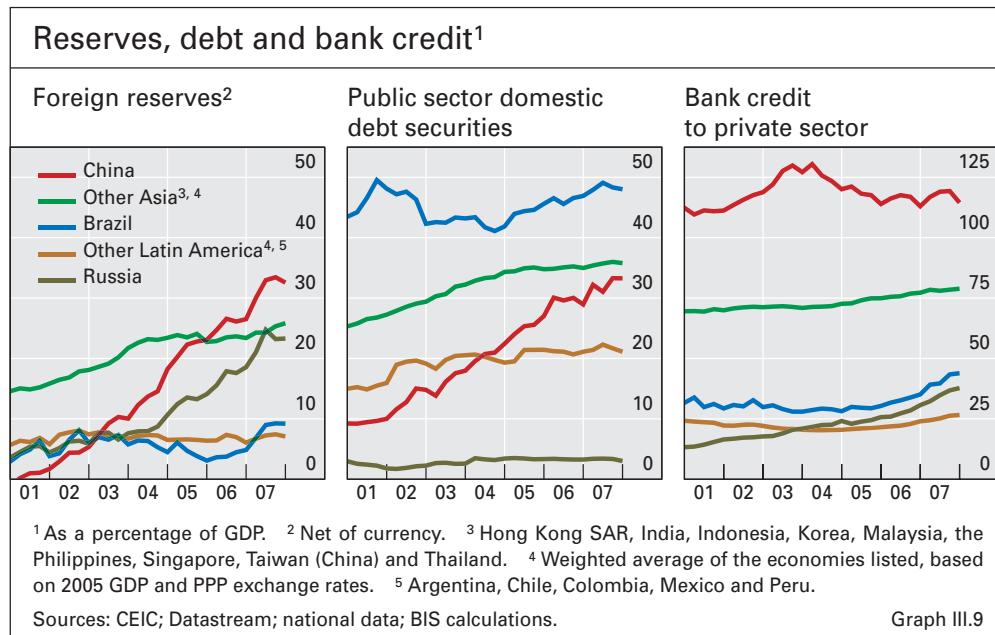
Other things equal, foreign reserve accumulation tends to increase the monetary base and ease monetary conditions. In order to prevent such easing, central banks take steps to limit or “sterilise” the monetary impact of foreign



exchange intervention. Many EMEs have done this by issuing debt securities of various maturities (and in some cases, notably in China and India, by raising the reserve requirements on banks). Sterilisation is rarely complete, however, and some easing in money or credit conditions usually still occurs. The balance sheets of domestic commercial banks in some EMEs have in fact expanded dramatically, in some cases reflecting increases in reserve money that could be associated with the low interest rates cited earlier. In addition, the liquidity of bank balance sheets has increased as bank holdings of government paper have risen. These developments have contributed to the substantial growth of bank credit to the private sector, which has matched or exceeded rapid nominal GDP growth (Graph III.9, right-hand panel). For example, between 2005 and 2007, credit to the private sector grew at an annual rate of 29% in Latin America, 25% in India and 17% in China.

Apart from affecting commercial bank portfolios, this massive expansion in foreign exchange reserves has increased the exposure of central banks (or governments) to losses associated with changes in differentials between domestic and foreign interest rates and in exchange rates. The substantial fall in the US federal funds rate since the second half of 2007 has widened the differential between domestic and US rates, implying that many central banks are facing running losses on foreign exchange reserve holdings financed by issuing domestic securities. As of April 2008, the median interest rate differential had risen to 1.1 percentage points in emerging Asia, 7.5 percentage points in Latin America and 6.6 percentage points in the other EMEs. In addition, the sharp depreciation of the US dollar against many EME currencies has led to valuation losses on foreign exchange reserves. Even assuming some diversification in the currency composition of foreign reserve holdings to include a strengthening euro, valuation effects since August last year must have been considerable. Losses on foreign reserve holdings can further complicate efforts to tighten monetary policy in response to rising inflation.

... exposing central banks to interest rate and exchange rate risks



More exchange rate flexibility

A number of EMEs have responded to pressures associated with large capital inflows by allowing greater exchange rate flexibility (Graph III.10). This approach has contributed to disinflation. In some cases, it also seems to have discouraged short-term speculative inflows (eg in Poland, South Africa and Turkey) by confronting market participants with two-way exchange rate risks. In contrast, in some other countries (including the Czech Republic, Indonesia and Slovakia), currency appreciation seems to have been associated with additional capital inflows, presumably on the expectation that the exchange rate would continue to appreciate.

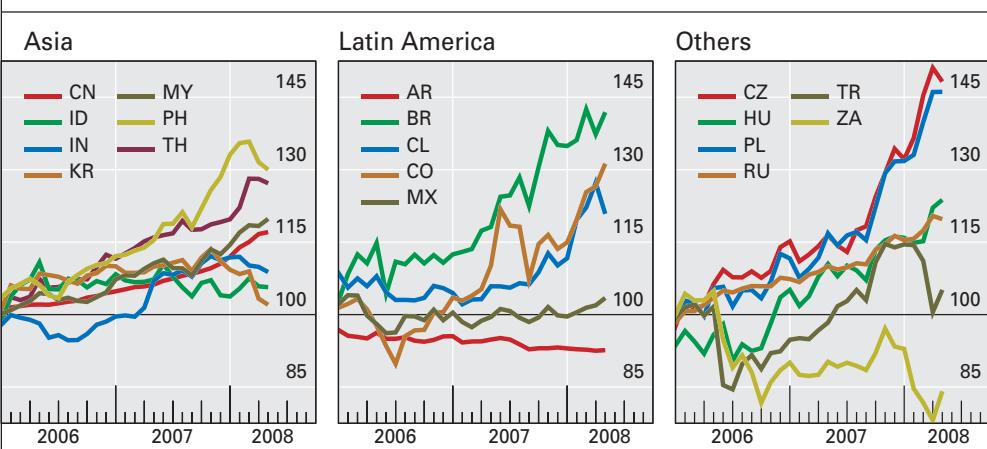
Controls on capital outflows ease, some controls on inflows

Several countries have resorted to capital account policies to cope with pressures associated with capital inflows. Some have eased controls on capital outflows: for example, China, India and Russia further liberalised their rules on residents' investment in foreign securities in 2007. The recent surge in China's private sector investments in foreign debt securities appears to be partly related to this move. In a few cases, countries have reintroduced selective controls on capital inflows (eg Brazil and Colombia). However, most countries have hesitated to do so because of the microeconomic distortions that such capital controls cause. Indeed, in March 2008 Thailand lifted the controls on capital inflows it had introduced in 2006.

Countercyclical fiscal policy

Another way to counter expansionary pressures arising from large capital inflows could be to tighten fiscal policy. However, such a move may produce two opposing effects on the exchange rate. On the one hand, as aggregate demand slows in response to fiscal consolidation, interest rates could fall, which would discourage capital inflows. On the other hand, in countries where the fundamentals are not particularly strong, fiscal tightening might reduce country risk premia, thus strengthening the currency and attracting further capital inflows. Possibly reflecting the relative importance of these effects, reliance on fiscal consolidation to curb appreciation pressures has varied from country to country. For example, in Chile public spending increases have

## Exchange rate developments<sup>1</sup>



AR = Argentina; BR = Brazil; CL = Chile; CN = China; CO = Colombia; CZ = Czech Republic; HU = Hungary; ID = Indonesia; IN = India; KR = Korea; MX = Mexico; MY = Malaysia; PH = Philippines; PL = Poland; RU = Russia; TH = Thailand; TR = Turkey; ZA = South Africa.

<sup>1</sup> US dollars per unit of local currency; 2005 = 100.

Source: National data.

Graph III.10

followed a fiscal rule which targets a structural fiscal surplus and requires that all surplus funds (which can be substantial when copper prices are high) be invested abroad. Similarly, several oil-exporting countries have relied on oil stabilisation funds to cope with rising oil revenues. Beyond the commodity-exporting countries, and some countries with fixed exchange rate regimes, fiscal tightening has not commonly been used in response to increasing capital inflows. Real government expenditure growth has actually accelerated over the past few years in Indonesia, Thailand, Latin America and central Europe.

In contrast, prudential and supervisory measures have been widely used to manage the impact of capital inflows on banking soundness and, more broadly, to offset the effects of rapid credit growth and rising asset prices (in particular house prices) on the domestic financial system. Several central banks in emerging Asia have used prudential instruments such as lower loan-to-value ratios (China, Korea), higher capital and provisioning requirements (India) and tighter lending criteria (Korea) to counteract the effects of capital inflows on the banking sector. CEE countries have, with some success, deployed an array of measures to mitigate the effects of bank-intermediated inflows, including raising risk weights on foreign currency loans, tightening foreign exchange liquidity requirements, lowering limits on open foreign exchange positions, and increasing reporting requirements and intensifying supervision of banks and other financial institutions. These measures have in some cases been combined with more traditional monetary policy tools, such as raising the level and broadening the coverage of reserve requirements.

Prudential measures to protect financial systems

## Vulnerabilities of EMEs

The turmoil in the global financial system and the US slowdown are likely to hurt the economic prospects of the EMEs, but the question is how much.

### *So far so good: the experience to date*

Growth forecasts  
are robust ...

As of May 2008, most forecasters were still optimistic about the near-term growth prospects for EMEs. While consensus forecasts for growth in the emerging markets in 2008 have declined in recent months, they still suggest that a marked degree of resilience is expected. The forecast for US growth in 2008 has fallen about 1 percentage point since September 2007, while the median forecast for emerging market growth has fallen only 0.2 percentage points over the same period (Graph III.11, left-hand panel). At 6.7%, the forecast for EME growth in 2008 is not far below the average for 2003–06. Regionally, forecasts for growth have declined in Asia and other emerging markets while remaining stable in Latin America.

... but should be  
treated with  
caution

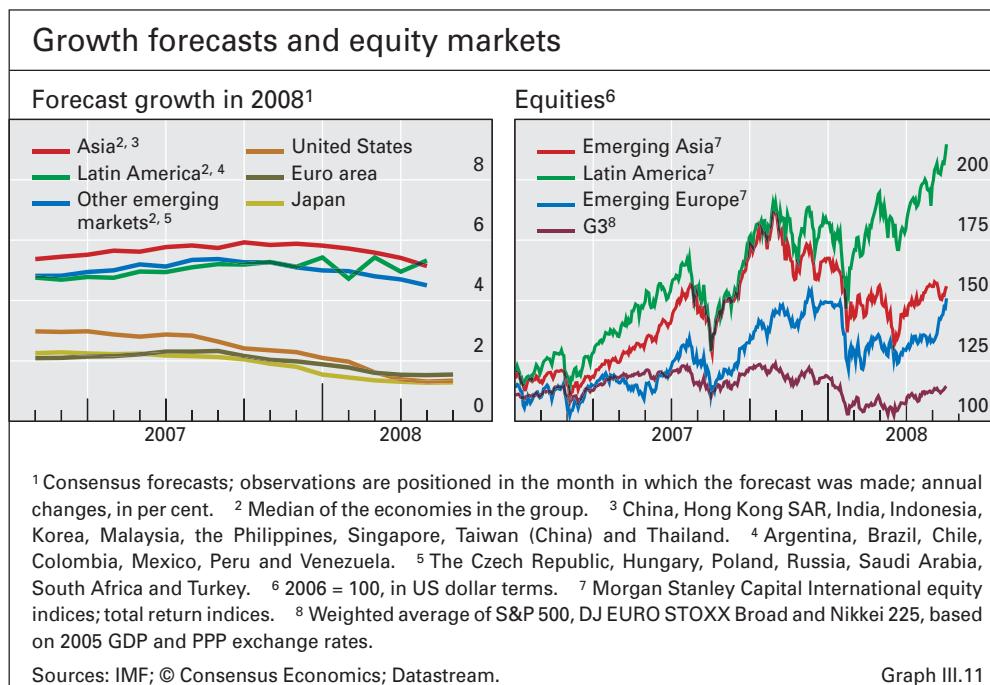
Yet consensus forecasts tend to miss business cycle turning points, and by a larger margin when the downturns are particularly pronounced (eg during crises). Thus, if global developments were to cause a severe downturn in EMEs, it is possible that consensus forecasts would not predict it.

Equity prices give a  
mixed picture

Equity markets provide mixed signals on the prospects for EMEs. In late 2007 or early 2008, equity markets weakened, even if high commodity prices supported individual regions, for example in Latin America (Graph III.11, right-hand panel).

In 2001, EME  
growth fell below  
average

The historical experience of the US slowdown in 2001 suggests that downside risks for EME growth could be substantial. During that period, US growth declined to 2 percentage points below average as the high-tech boom collapsed. At the same time, US import growth fell to 15 percentage points below average. Exports of emerging markets were hard hit, especially those of East Asian economies whose exports were concentrated on the high-tech sector (Graph III.12, top panels). During the 2001 episode, a 1 percentage point below average growth rate in the United States was associated with a growth rate 0.6 percentage points below average in China, and even further



below average in other Asian economies. In Latin America, the corresponding shortfalls ranged from 0.7 to 1.8 percentage points.

However, the experience of 2001 appears thus far to differ from experience in the current episode. At the time of the US recession in 2001, the business cycle of emerging market economies appeared to be closely linked ("coupled") to that of the United States. In contrast, the recent US slowdown appears to date to have been associated with a much smaller decline in EME growth. Indeed, although slowing, EME growth has remained above average (Graph III.12, bottom left-hand panel) as US growth has faltered.

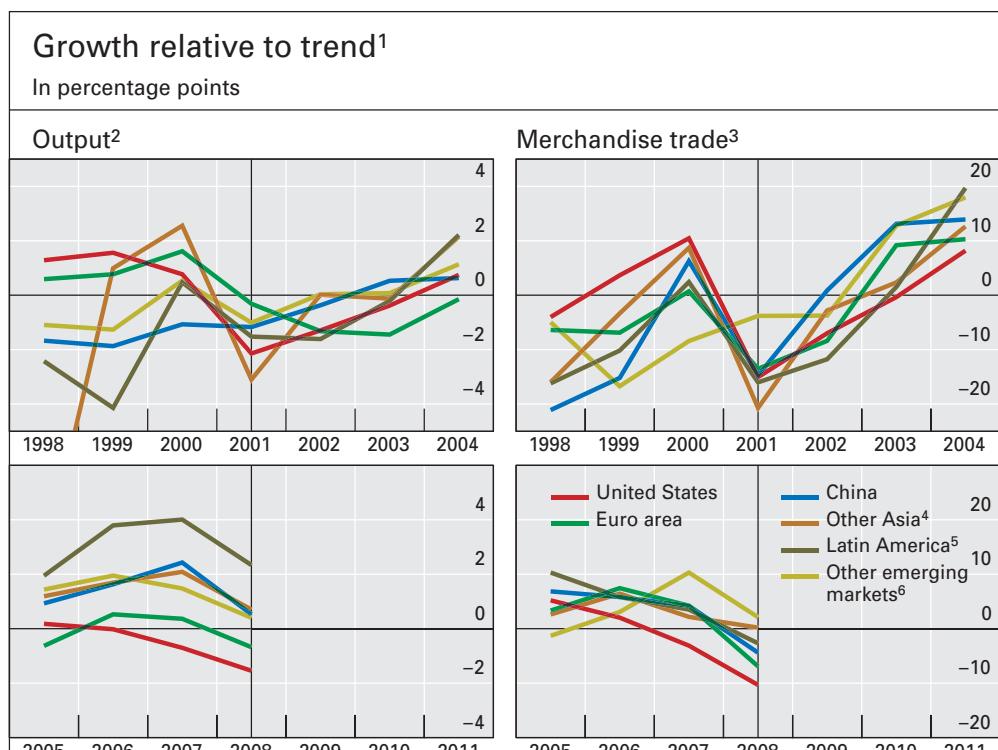
Two explanations can be offered for these differences in growth performance across the two periods. First, in contrast to 2001, emerging market exports continued to grow above their average rates in 2007 (Graph III.12, bottom right-hand panel), even if US import growth was below average. However, as discussed below, the risk of a more severe outcome nonetheless remains.

Second, EMEs have recently been able to counter the effects of any fall in demand for their exports by boosting their domestic demand more than in 2001 (Graph III.1). Compared to 2001, private consumption spending has risen more strongly in emerging Asia and Latin America. The contribution to growth of investment spending switched from negative in 2001 to a strong positive for Asia, Latin America and central Europe in 2007. Thus, there seems to be some growth momentum for domestic demand in most emerging market

Growth today  
remains above  
average ...

... supported by  
robust exports ...

... and domestic  
demand



<sup>1</sup> Deviation from average annual growth from 1998 to 2007; median of the economies in each group; estimates and consensus forecasts for 2008. <sup>2</sup> Real GDP growth. <sup>3</sup> Growth in nominal exports; for the United States and euro area, nominal imports. <sup>4</sup> Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan (China) and Thailand. <sup>5</sup> Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela. <sup>6</sup> The Czech Republic, Hungary, Poland, South Africa and Turkey.

Sources: IMF; © Consensus Economics; national data; BIS calculations.

Graph III.12

Three  
vulnerabilities can  
be identified

regions. This may partly explain why, in spite of increasing globalisation, research shows that the impact on EMEs of economic activity in advanced industrial economies has declined.

Although growth forecasts remain robust for EMEs for 2008, there are risks that this may not continue (see below). First, emerging market exports might weaken, possibly more than predicted by recent consensus forecasts. Second, there may be constraints on EMEs' ability to boost domestic demand to compensate for any weakening in exports. Third, EMEs with high current account deficits and high short-term debt, as well as those that rely heavily on cross-border bank financing, may be vulnerable to reversals of capital flows.

#### *Resilience of EME export growth*

Emerging market  
exports are  
vulnerable ...

Exports of EMEs could be significantly affected if the US economic slowdown deepens, for at least three reasons.

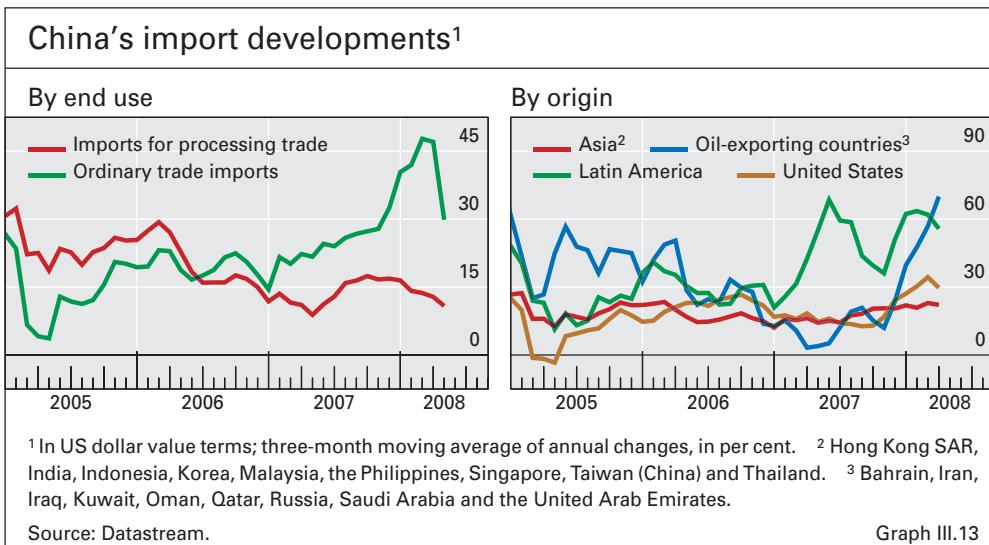
First, US markets remain important for emerging market exporters. For example, while the share of the United States in exports of Asian EMEs outside China has fallen, it remains sufficiently large – ranging from a low of 10% in Singapore to a high of 18% in Malaysia in 2007 – to ensure that total exports would be materially affected by a sharp reduction in US demand. The US share in China's exports is around 20%. As well as lowering direct demand for Chinese exports, a US slowdown could also reduce China's imports of intermediate goods and commodities from other EMEs that are used as inputs for export production. While China could offset the contractionary impact of a US slowdown by boosting its own domestic demand (see below), a concern raised in last year's *Annual Report* was that China has tended to import relatively little from other EMEs (notably in emerging Asia) for its own domestic demand. Thus, they would be little helped.

... and China might  
provide only partial  
support

Recent developments ease but do not fully dispel such concerns. For example, between September 2007 and February 2008, China's total import growth (in US dollars) accelerated from 16% to 35%, reflecting a steep rise in the growth of ordinary trade imports, which are more closely related to China's domestic demand. At the same time, the growth in imports for processing trade, which are directly linked to China's exports, fell (Graph III.13, left-hand panel). During this period, the growth in China's imports from Asia did rise, but at a much smaller rate than the growth in imports from oil-exporting countries or Latin America (Graph III.13, right-hand panel). As these figures refer to import values in US dollars, they should be interpreted with caution. However, they suggest that emerging Asian exporters could benefit relatively less from growth in China's imports outside the processing trade category. More generally, there is a risk that the growth in China's imports overall could slow down sharply should the US economy weaken further, with adverse consequences for its trading partners. This risk is highlighted by a distinct slowdown in China's imports in March.

Risks should  
growth in Europe  
slow

EME exports are also being supported by the greater resilience of EU imports and growth so far, compared to 2001. Any substantial deterioration in the growth outlook in Europe could adversely affect emerging markets (see Chapter II).



Second, US demand could fall in those particular sectors in which EME exports are heavily concentrated, as occurred with Asian IT exports during the 2001 US recession. While to date the slowdown has been concentrated in the housing sector, falling US demand could yet reduce US imports of final goods produced by EMEs. A decline in US non-residential fixed investment in the first quarter of 2008 reinforces this concern. Admittedly, so far the overall data are favourable: the value of US total imports and those from EMEs increased up to the first quarter of 2008. However, US imports have fallen in some sectors that represent the top exports of EMEs. For example, the growth in imports of certain IT products that are important for a number of East Asian economies (eg Korea, Malaysia and Singapore) has declined. The growth in demand for consumer goods like toys and for certain heavy vehicles has also fallen, affecting producers in some EMEs, such as China and Mexico. As noted earlier, a more pronounced US slowdown, coupled with weaker growth in other advanced industrial economies, could also lead to weaker commodity prices, slowing growth in commodity-exporting countries in Latin America, Africa and the Middle East.

Final goods exporters are vulnerable ...

Third, dollar depreciation could reinforce the contractionary impact of a US slowdown on EME net exports. While US dollar appreciation against emerging market currencies in 2001 mitigated the impact of the US slowdown on EMEs, the dollar has depreciated considerably against many emerging market currencies since July 2007 and this could well continue. Moreover, a number of emerging market currencies have remained stable or depreciated on an effective basis (see Graph V.2 in Chapter V), suggesting that future appreciation might be warranted.

... and dollar depreciation poses risks

#### *Resilience of domestic demand*

Notwithstanding the increasing role of domestic demand in EME growth cited earlier, global conditions still pose some risks, as increases in consumption or investment spending to offset a slowdown could be constrained by a number of factors.

Lower exports could reduce domestic demand

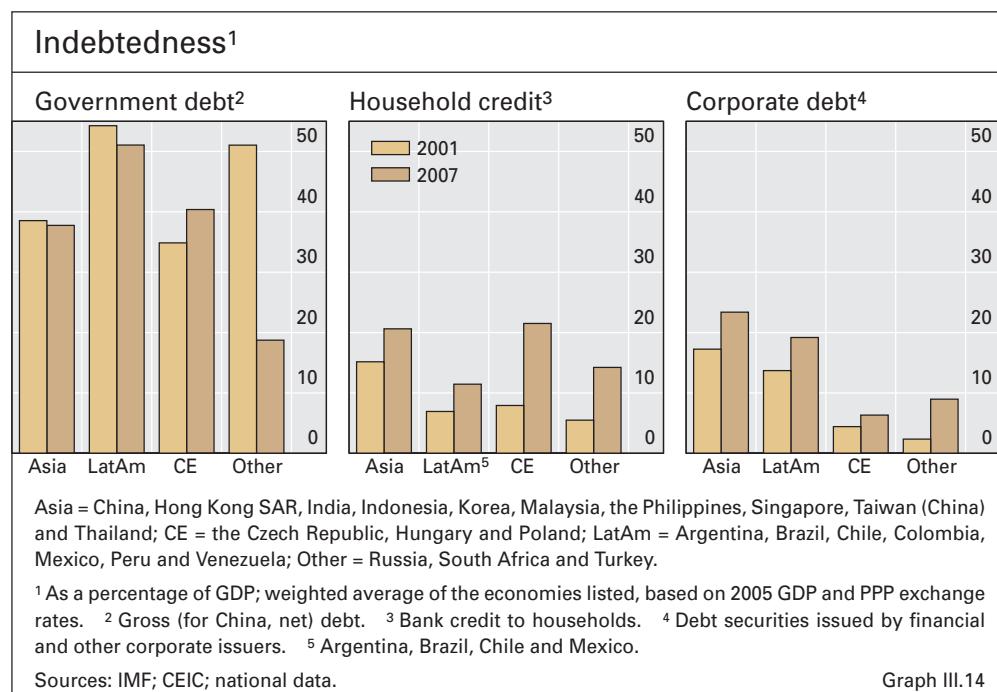
One risk is that, by reducing prospective returns and incomes, lower demand for exports could reduce consumption and investment spending. In the case of households, the squeeze on incomes is being aggravated by higher inflation, particularly among commodity-importing countries. Furthermore, recent experience suggests that EMEs could find it difficult to raise investment to counter a slowdown in GDP growth. In some countries where investment spending has been strong, notably China, there are concerns about overinvestment. In other EMEs, investment growth has generally not exceeded the growth in GDP even during expansions. Since the late 1990s, investment-to-GDP ratios have risen only moderately in emerging Asia excluding China and India (recently averaging about 24% compared to over 40% in China) and in Latin America (averaging around 20%).

Scope for fiscal stimulus is sometimes limited ...

Another risk is that tighter financing conditions could constrain spending. While public debt as a percentage of GDP has generally fallen in this decade (Graph III.14, left-hand panel) and the fiscal balances of most EMEs have improved, fiscal positions would worsen in the event of a downturn, while the median public debt ratio in EMEs is still high at about 38% of GDP. Rising oil prices are also adversely affecting fiscal positions in a number of EMEs that subsidise energy. This could limit the scope to use countercyclical fiscal policy in the event of a sharp slowdown. In this setting, sovereign spreads remain well below the levels observed in past periods of financial turbulence, but are significantly higher than they were in the first half of 2007 (Chapter VI), highlighting the risks that financing constraints could become binding.

... and rising private debt could be a challenge

Household and corporate indebtedness has increased since 2001 (Graph III.14, centre and right-hand panels). While debt positions so far appear to be sustainable, tighter financing conditions could limit the scope for raising consumption or investment. In some countries, low debt ratios actually reflect a



lack of financial development and of household access to credit, so the ability to borrow to increase spending would be limited in any case. In other countries where household access to credit has improved, the rapid growth in credit in recent years poses risks (see below). As for the corporate sector, corporate bond spreads have recently widened more than sovereign spreads in a number of EMEs, indicating that some borrowers are starting to face tighter financing conditions after many years of easy borrowing.

#### *Vulnerability to capital flow reversals*

Despite some tightening of external financing conditions, the EMEs as a whole – with improved fundamentals, abundant reserves and large current account surpluses – appear to be less vulnerable to reversals in capital flows today than they were in the past. Nevertheless, two types of vulnerabilities to such reversals can be highlighted. First, EMEs with large current account deficits and a high proportion of short-term foreign debt could find it difficult to secure foreign funding if global financing conditions were to tighten more severely. Second, emerging market countries that depend heavily on cross-border bank financing are vulnerable to a withdrawal of such financing due to problems in banks both in advanced industrial economies and at home (see Chapter VII).

Some vulnerability to capital flow reversals

Countries that might find it particularly difficult to secure foreign funding if global financing conditions were to tighten further can be identified in the Baltic and southeastern European regions. These countries have very large current account deficits, only around half of which are covered by FDI, usually considered the most stable form of foreign financing (Table III.4). They are also burdened with a high proportion of short-term external debt (120% of foreign

Selected external vulnerability indicators, 2007						
	Current account balance <sup>1</sup>	Net FDI inflows <sup>1</sup>	Net portfolio investment inflows <sup>1</sup>	Net other investment inflows <sup>1, 2</sup>	Short-term foreign debt <sup>3</sup>	Cross-border claims <sup>4</sup>
China	11.1	1.7	0.4	0.6	8.0	4.1
India	-1.8	1.1	2.9	5.3	29.3	21.1
Other emerging Asia <sup>5, 6</sup>	8.6	1.7	-1.7	1.4	44.3	72.8
Brazil	0.3	2.1	2.9	1.0	34.5	11.6
Colombia	-3.8	5.0	0.2	1.3	49.3	17.7
Mexico	-0.8	2.0	0.7	-0.4	38.4	27.2
Other Latin America <sup>6, 7</sup>	4.1	2.0	-2.0	-0.3	56.4	32.1
Central Europe <sup>6, 8</sup>	-4.4	2.3	-1.3	6.2	61.6	55.0
Other emerging Europe <sup>6, 9</sup>	-14.6	7.6	-0.9	11.8	119.2	75.8
Russia	5.9	0.3	-0.2	7.0	20.5	55.0
Middle East <sup>6, 10</sup>	14.9	0.9	-3.8	-1.8	52.6	61.4
South Africa	-7.3	0.9	4.2	2.6	55.1	14.8

<sup>1</sup> As a percentage of GDP. <sup>2</sup> Banks and other sectors. <sup>3</sup> As a percentage of foreign exchange reserves. <sup>4</sup> External positions of reporting banks vis-à-vis individual countries on a residence basis; amounts outstanding as a percentage of domestic credit.

<sup>5</sup> Indonesia, Korea, Malaysia, the Philippines, Singapore and Thailand. <sup>6</sup> Simple averages of the ratios of the economies listed.

<sup>7</sup> Argentina, Chile, Peru and Venezuela. <sup>8</sup> The Czech Republic, Hungary, Poland, Slovakia and Slovenia. <sup>9</sup> Bulgaria, Croatia, Estonia, Latvia, Lithuania, Romania and Turkey. <sup>10</sup> Israel and Saudi Arabia.

Sources: IMF; BIS locational banking and securities statistics.

Table III.4

exchange reserves on average). Furthermore, cross-border loans in these countries account on average for 76% of domestic credit. South Africa, with a current account deficit of more than 7% of GDP and a high reliance on portfolio inflows, is also in a relatively vulnerable position.

Bank inflows could reverse ...

In view of the turmoil engulfing banks in advanced industrial economies, the second major vulnerability in some EMEs concerns the sustainability of bank-intermediated capital inflows. Historically, bank flows have periodically been subject to sharp reversals, such as during the early 1980s in Latin America and during 1997–98 in emerging Asia. While the extent of foreign funding of domestic credit is fairly large in many emerging markets, it is considerably lower today than in the past. This is partly because of foreign-owned bank subsidiaries that increasingly fund themselves locally, rather than relying on “pure” cross-border credit as they did earlier.

One exception, as noted above, is central and eastern Europe. This region differs markedly from most other emerging markets in that external borrowing is rising in line with rapid economic and financial integration with the euro area and its banking systems are mostly foreign-owned (which is also true of Mexico). Most western European parent banks seem to have plans to sustain cross-border financing of their CEE subsidiaries, while gradually slowing credit to those economies that seem to be overheating. Moreover, Swedish, Austrian and Italian banks with a large presence in the region tend to take a long-term view of the growth opportunities in CEE, and have consistently sought to protect their franchises.

... if parent banks faced funding problems

Nevertheless, potential problems in either parent banks’ home markets or the emerging economy host markets pose risks of capital inflows declining or even reversing. For instance, although the main parent banks in CEE have so far not experienced major losses on US subprime mortgages or structured products, they obtain a substantial part of their funding in foreign currencies in international wholesale markets. Thus, Swedish banks borrow euros and onlend these funds to their subsidiaries in the Baltic states, while Austrian and Italian banks borrow in Swiss francs and onlend these funds to their subsidiaries in central and southeastern Europe. If these wholesale markets dried up, the main suppliers of external financing to emerging Europe would come under funding pressure. Alternative sources of bank funding in emerging Europe are scarce. Moreover, domestically owned banks have limited capacity to raise funds externally, and even those that do (eg Russian banks) have seen their funding sharply reduced since August 2007. Locally, the growth of the deposit base has lagged behind credit growth in most countries in CEE for several years now, which was why CEE banks started to seek external funding in the first place.

Large multinational banks in small countries

Risks to banking flows in CEE countries are accentuated by the fact that the exposure of a parent institution to a host country is typically a much smaller fraction of its worldwide loan portfolio than is the exposure of the host country to a particular parent bank. Changes in lending policies that are modest from the perspective of the parent institution can thus have a major impact on macroeconomic and financial stability in the host country (see Chapter VII in last year’s *Annual Report*).

Bank-intermediated capital inflows could also come under pressure via another route in a number of emerging market regions as well as CEE. Bank credit to the private sector has expanded tremendously over the past five years – in Latin America by a cumulative 7 percentage points of GDP and in CEE by 30 percentage points. Such rapid credit growth could have overstretched the capacity of institutions to assess and monitor credit effectively, for instance due to shortages of qualified bank officers and institutional weaknesses that make it difficult for banks reliably to estimate credit risk or risk-adjusted returns, or to recover collateral. If so, banks will have to increase their provisioning when the underestimation of risk is finally recognised. This could lead the management of banks to conclude that return-on-equity targets (which are often quite ambitious in emerging markets) cannot be met and to curtail lending growth, possibly very suddenly.

Credit risk possibly underestimated

Banks operating in emerging markets also face risks from exposure to the property market. House prices in several Asian EMEs (including China, Hong Kong SAR, India and Singapore), and in particular in emerging Europe, have increased rapidly in recent years. If asset quality deteriorates significantly, internal risk controls at banks could force a sharp reduction in credit to protect bank capital.

Risks from rising house prices ...

A sudden drying-up of capital inflows could lead to major exchange rate corrections. This might have substantial balance sheet and wealth effects in countries with sizeable unhedged foreign currency liabilities. Most vulnerable in this respect are again countries in CEE, which have borrowed heavily abroad and where a large proportion of the recent credit growth has been denominated in foreign currencies. This exposure is suggested by the positive correlation between the change in the cost of insurance against a credit event in emerging markets (as measured by the increase in credit default swap spreads for sovereign debt since end-July 2007) and the degree of reliance on cross-border financing (as measured by the share of foreign liabilities in total liabilities of the banking sector at end-2007) (Graph III.15).

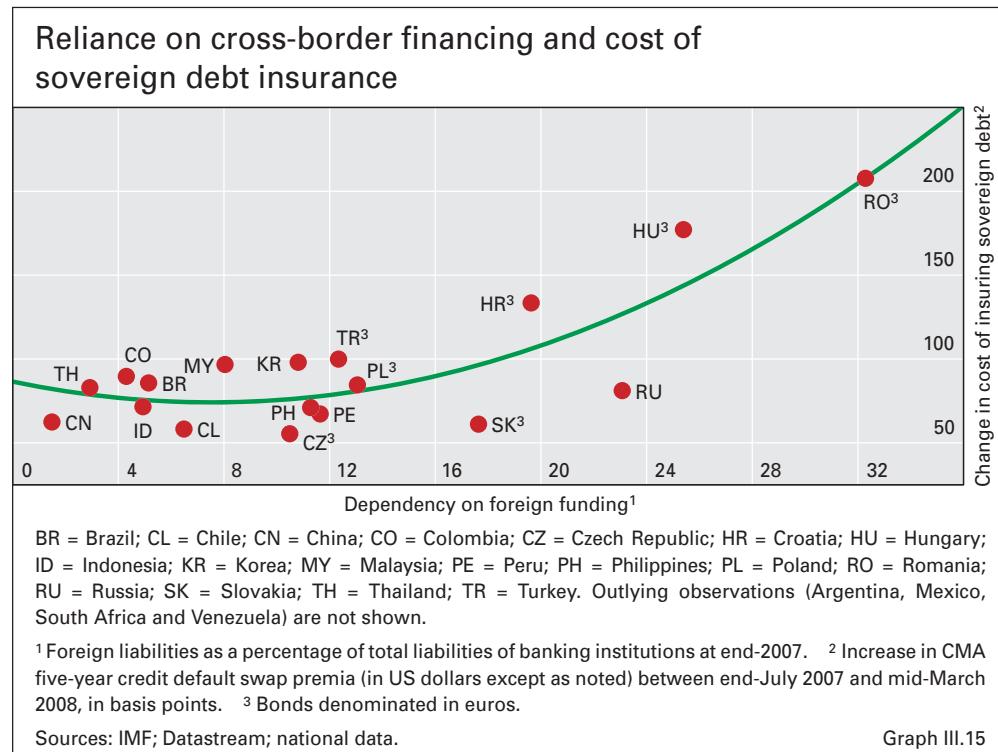
... and currency mismatches

There are still no clear signs of a change in the behaviour of banks lending to emerging markets. Credit growth was sustained at a relatively brisk – though slowing – pace into early 2008. Nor is there any strong evidence of a dwindling in cross-border bank flows. In emerging Asia and Latin America, external funding pressures remained modest through the first quarter of 2008, partly because much of the financing for domestic credit growth has come from an expanding domestic deposit base. The resilience of domestic banking systems despite the global turmoil is reflected in the general stability of domestic currency interbank markets. Although backward-looking, prudential indicators such as capital adequacy, non-performing loan and provisioning ratios are mostly rather solid and stable in all three major emerging market regions, providing some buffer for their banking systems.

No broad retreat from EMEs yet ...

Developments have not been uniform, however. On the one hand, the performance of some market indicators (eg local currency bond spreads in Hungary, the exchange rates in Romania and South Africa) suggests that market participants are starting to take greater account of country-specific signs of vulnerability. The countries that have been affected most by the recent

... although some EMEs have been affected



turmoil have been those with the largest internal and external imbalances and/or insufficient policy credibility, as well as those that had previously experienced strong capital inflows coupled with rapidly rising asset valuations and risks of overheating (eg Romania, Russia, South Africa and Turkey).

On the other hand, commodity prices and supply side factors continue to favour some emerging markets. Moreover, various supply side factors could also support further inflows. These include portfolio diversification by institutional investors in Europe and North America, the search for higher returns by retail investors in Japan and the recycling of oil-based surpluses by institutional or sovereign investors in the Middle East. In the short term, increasing concerns about asset quality in advanced industrial economies could even stimulate portfolio flows to some EMEs, in particular those with large external surpluses.

Nonetheless, a significant US-led economic slowdown would probably dampen most types of capital inflows to emerging markets. Sovereign and corporate bond issuance in global markets, and flows related to carry trades involving emerging markets, have already declined (see Chapter V). In addition to lower capital inflows, a slowdown in the advanced industrial economies would also lead to a decrease in workers' remittances. This could have particularly large effects in countries in Central America, Mexico, India and the Philippines, thus increasing their external financing needs relative to the more comfortable circumstances of the past few years.

Other EMEs could experience further inflows ...

... but overall inflows to EMEs may fall

## IV. Monetary policy in the advanced industrial economies

### Highlights

Monetary policy in the advanced industrial economies faced two conflicting challenges during the period under review. On the one hand, tensions in financial markets threatened to spill over into the real economy by way of tighter credit conditions and a loss in confidence. Everything else equal, this would call for lower interest rates in order to offset the drag on aggregate demand. On the other hand, inflationary pressures that stemmed from rising commodity prices, together with high capacity utilisation and tight labour markets in many economies, threatened to feed into longer-term inflation expectations, thus calling for tighter monetary policy.

The manifestation of these challenges varied across countries and regions, which explains, at least in part, why central banks dealt with them in different ways (Table IV.1). In the United States, weakness in the housing sector and related financial turmoil clouded the outlook for growth substantially. The Federal Reserve reacted forcefully and cut the target federal funds rate in several steps from 5.25% in September 2007 to 2% in April 2008. In other regions, where the impact of the financial turmoil was less pronounced, monetary policy was driven to a greater extent by inflation developments. The central banks of Australia, New Zealand, Norway and Sweden continued to tighten policy. A middle course was followed by another set of central banks. The ECB held its policy rate constant at 4% throughout the period, even though inflation rose to the highest level since the introduction of the euro in 1999. The Bank of Japan also kept its policy rate unchanged at 0.5%. The Bank of Canada and the Bank of England increased rates in July 2007 but reduced them later in the year and in the early part of 2008.

Changes in interest rates were only one measure through which central banks responded to the dislocation in financial markets. Even before the turbulence led to any changes in policy targets, central banks in several countries adjusted their operations to keep reference rates near targets and to provide financing in markets where liquidity had evaporated. The various types of operations and the reasoning behind them are discussed in the last section of this chapter. The first section provides an overview of the monetary policy actions of the various central banks and puts them into context, and the second turns to issues related to central bank communication.

### Developments in monetary policy

#### *The situation in mid-2007*

In mid-2007, central banks were in the process of withdrawing the sizeable monetary accommodation put in place earlier in the decade and were moving

Monetary policy on a tightening path

Policy rates, GDP growth and inflation projections						
Policy rates <sup>1</sup>	Actual			Expected <sup>2</sup> for June 2008 as of:		
	29 Jun 07	16 May 08	Change	29 Jun 07	16 May 08	Change
European Central Bank	4.00	4.00	0.00	4.50	4.00	-0.50
Bank of Japan	0.50	0.50	0.00	1.00	0.50	-0.50
Federal Reserve	5.25	2.00	-3.25	6.00	2.00	-4.00
Reserve Bank of Australia	6.25	7.25	1.00	6.75	7.25	0.50
Bank of Canada	4.25	3.00	-1.25	5.25	2.75	-2.50
Reserve Bank of New Zealand	8.00	8.25	0.25	8.00	8.25	0.25
Central Bank of Norway	4.50	5.50	1.00	5.75	5.50	-0.25
Sveriges Riksbank	3.50	4.25	0.75	4.25	4.25	0.00
Swiss National Bank	2.50	2.75	0.25	3.00	2.75	-0.25
Bank of England	5.50	5.00	-0.50	6.00	5.00	-1.00
Growth and inflation projections <sup>3</sup>	Real GDP for 2008 as of:			Inflation for 2008 as of:		
	Mid-2007	May 2008 <sup>4</sup>	Change	Mid-2007	May 2008 <sup>4</sup>	Change
European Central Bank	1.8–2.8	1.3–2.1	-0.60	1.4–2.6	2.6–3.2	0.90
Bank of Japan	2.0–2.3	1.4–1.6	-0.65	0.8–1.0	2.4–2.8	1.70
Federal Reserve	2.5–3.0	0.0–1.5	-2.00	1.75–2.0	1.9–2.5	0.33
Reserve Bank of Australia	4.25	2.25	-2.00	2.5–3.0	4.50	1.75
Bank of Canada	2.50	1.40	-1.10	2.10	1.80	-0.30
Reserve Bank of New Zealand	3.10	3.00	-0.10	2.20	3.40	1.20
Central Bank of Norway	3.75	3.50	-0.25	3.50	3.00	-0.50
Sveriges Riksbank	3.00	2.60	-0.40	2.30	3.50	1.20
Swiss National Bank	...	1.5–2.0	...	1.50	2.00	0.50
Bank of England <sup>5</sup>	2.54	1.29	-1.25	2.06	3.77	1.71

<sup>1</sup> For the ECB, minimum bid rate on the main refinancing operations; for the Bank of Japan, uncollateralised target rate; for the Federal Reserve, target federal funds rate; for the Reserve Bank of Australia, target cash rate; for the Bank of Canada, target overnight rate; for the Reserve Bank of New Zealand, official cash rate; for the Central Bank of Norway, sight deposit rate; for Sveriges Riksbank, repo rate; for the Swiss National Bank, midpoint of the three-month Libor target range; for the Bank of England, Bank rate. <sup>2</sup> As published by JPMorgan Chase. <sup>3</sup> As published by central banks. <sup>4</sup> Or latest available. <sup>5</sup> Midpoint of forecast range.

Sources: Central banks; JPMorgan Chase.

Table IV.1

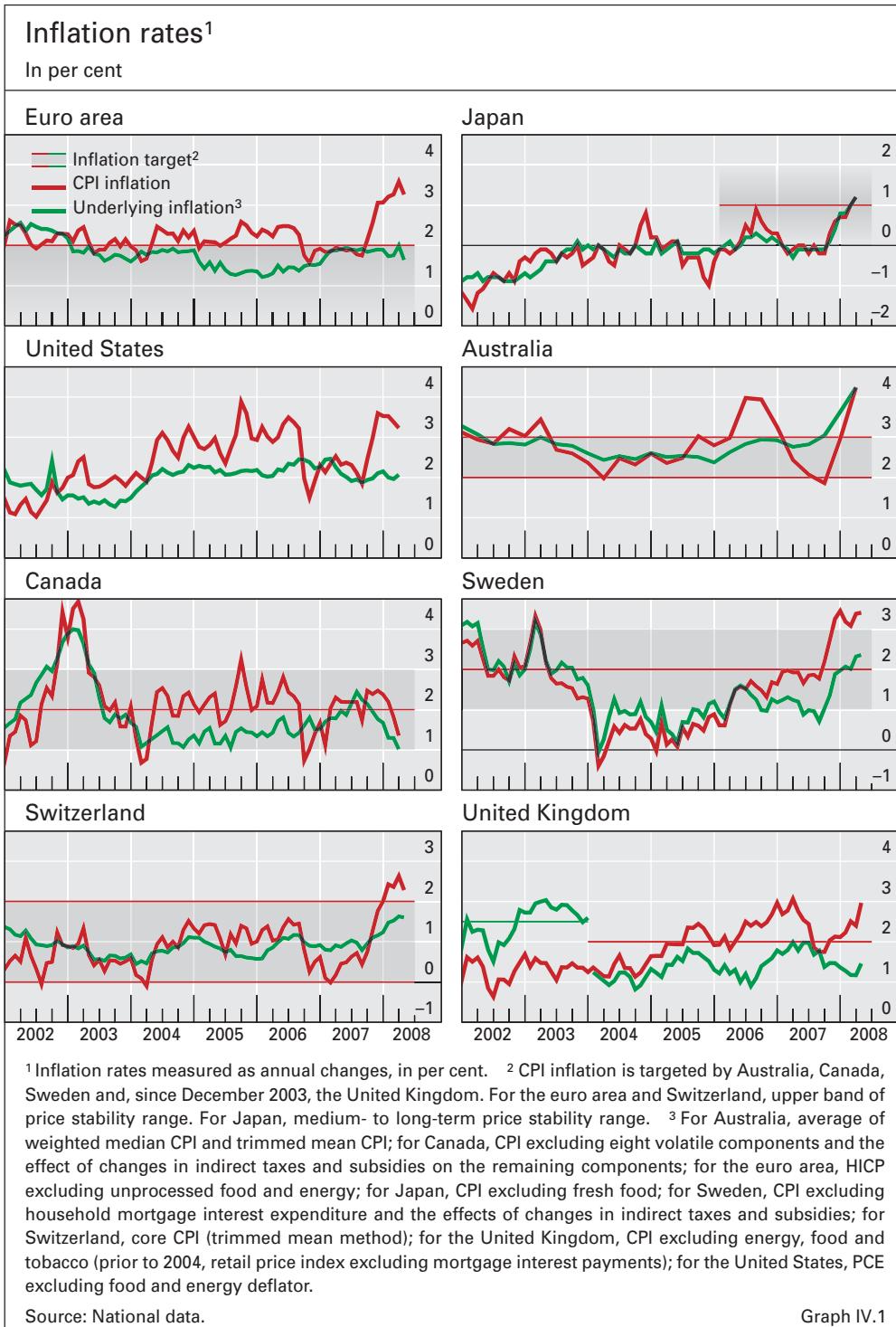
to a posture of restraint. The timing of policy moves varied, however, depending on respective cyclical positions.

Output growth in most countries was seen to be above its long-run potential, although it was expected to moderate in some cases (see Chapter II). Inflation rates had mostly declined from the peaks recorded earlier in the year (Graph IV.1) but were expected to pick up again in the second half. Generally high levels of capacity utilisation and tight labour markets, following a prolonged period of above potential growth in several countries, contributed to worries about inflationary pressures.

Above potential growth and inflationary pressures ...

... along with rapid money and credit growth ...

Possible inflation risks were also signalled by high rates of growth of both money and credit in many economies. In the euro area, the broad monetary aggregate M3 had expanded at an annualised rate of 12% in the first half of 2007, and growth continued to accelerate. Rising short-term interest rates had, however, led to a decline in the growth of M1 and probably contributed to the stabilisation of the growth of lending to the private sector, albeit at a double digit rate. From the perspective of the ECB's strategy, which assigns a



prominent role to monetary aggregates, the surge in M3 pointed to upside risks to inflation over the medium term, since portfolio shifts and other special factors could explain only part of this monetary expansion. High rates of growth in money and credit were also recorded in other economies. In Australia, for example, business credit grew at an annual rate of 22% in the first half of 2007, the fastest rate since the late 1980s.

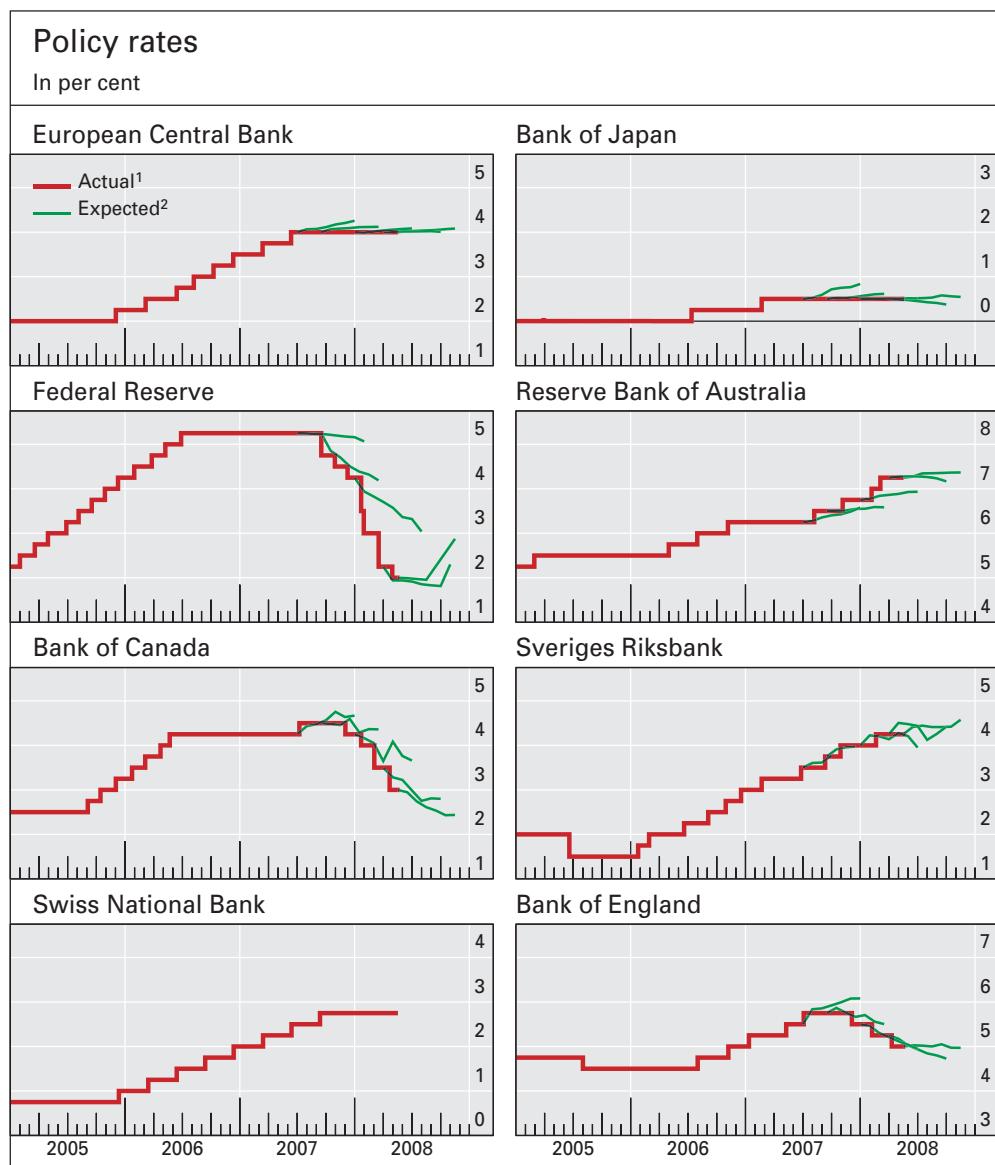
In response to strong growth and inflationary pressures, policy rates were raised in all the economies under review between June and early August 2007

... led to tighter policy in most economies

Stable policy rates in the United States ...

(Graph IV.2), except in the United States and Japan, where the economic environment was different. Even after these increases, monetary policy was judged to be on the accommodative side in most economies. Indeed, several central banks, including the Bank of Canada, Sveriges Riksbank and the Swiss National Bank, indicated that rates might have to rise further if inflationary pressures persisted.

In the United States, the Federal Reserve had increased the target federal funds rate from 1% to 5.25% between June 2004 and June 2006, but had kept rates constant thereafter despite a weakening outlook for economic growth. A decline in housing construction led to growth below the Federal Reserve's estimate of potential in the first half of 2007. Core inflation had edged higher



Sources: Central banks; Bloomberg; BIS calculations.

Graph IV.2

during most of 2006 and early 2007, but eased somewhat towards the middle of 2007. The Federal Reserve expected core inflation to moderate further over the coming quarters as the economy weakened and the full effect of past interest rate increases worked its way through the system. Growth was expected to recover to its long-term average in 2008 as the housing market stabilised.

The Japanese economy had been growing at a pace considered to be somewhat above potential in the first half of 2007, but this had yet to translate into a lasting shift to positive inflation. Consumer prices remained essentially unchanged in the first half of the year, but producer prices did increase a little. The Bank of Japan thus left its policy rate at the still very low nominal level of 0.5%, although it indicated that rates would have to rise eventually once economic growth fed into increasing prices.

#### *Monetary policy during the turbulence*

Monetary policymaking became more complicated in the second half of 2007. Conditions in financial markets worsened substantially in the middle of August (see Chapter VI), when problems spilled over from asset-backed securities markets to the interbank money market. Towards the end of the year, larger than anticipated increases in commodity prices pushed up inflation rates sharply in most countries, with possible consequences for longer-term inflation expectations.

Central banks thus faced a difficult trade-off. Cutting rates quickly and substantially could support confidence in financial markets and the economy at large and thus prevent the problems in the financial sector from spilling over into the wider economy. However, loosening policy too much in an environment of high inflation could lower public confidence in the strength of the central bank's commitment to price stability, which could result in longer-term inflation expectations becoming unanchored. This, in turn, would require renewed tightening further down the road, with potentially even larger costs to the economy. Alternatively, holding rates steady or even raising them could allow a slowing of the economy to offset the impact on inflation and inflation expectations of rising commodity prices. Of course, this approach would run the risk of aggravating already fragile financial conditions and provoking a sharper slowdown of the economy than would be necessary to bring inflation back into the preferred range. The trade-off between the two alternatives was rendered even more complicated by the fact that the likely duration of the financial turmoil and its potential impact on the real economy were difficult to assess in real time.

Initially, it was not clear whether the turbulence would persist and to what extent economic activity might be affected either by tighter financing conditions for the non-financial sector or by a loss of confidence. Central banks therefore chose to wait until more information became available before changing their policy stance. For example, the Reserve Bank of Australia left the cash rate unchanged at 6.5% following its Board meeting in early September, even though members believed that further tightening might be required to prevent the continued strength in the economy from leading to inflation rising above

... and Japan

Financial market turbulence and sharp rises in commodity prices ...

... led to a difficult trade-off

An initial wait-and-see attitude ...

target. On balance, the Board felt that the tighter financial conditions might control inflation independently of movements in the cash rate, thus making any policy action unnecessary. Similarly, the Governing Council of the ECB left policy rates unchanged at its meeting on 6 September. While noting the risks to price stability, the ECB argued that it was necessary to gather more information before drawing further conclusions for monetary policy. And, in the announcement following its August meeting, the Bank of Japan pointed to the large swings in the financial markets as a reason for delaying any further policy tightening.

Subsequently, it became clear that the turmoil in financial markets would not quickly abate and would have significant consequences that monetary policymakers would have to take into account. At the same time, large increases in food and energy prices led to considerably higher than anticipated rates of inflation towards the end of the year. On the face of it, central banks in the advanced industrial economies appear to have dealt with the two issues rather differently.

Some central banks, most notably the Federal Reserve, cut policy rates sharply in order to dampen the fallout on the economy from the turbulence. The Federal Open Market Committee (FOMC) reduced the target federal funds rate by 1 percentage point in the second half of 2007 and by an additional  $2\frac{1}{4}$  percentage points in early 2008 after it became apparent that economic activity was slowing by more than had been anticipated. The Bank of England initially held rates constant but lowered them by a total of 75 basis points starting in December 2007 as the outlook for the economy weakened. Slower growth was also recorded in Canada, where the stimulative impact of higher commodity prices was largely offset by the sharp appreciation of the exchange rate. The Bank of Canada consequently reduced the target for the overnight rate by a cumulative  $1\frac{1}{2}$  percentage points between December 2007 and April 2008.

Other central banks increased interest rates in the light of persistent inflationary pressures. For example, the Reserve Bank of Australia, the Central Bank of Norway and the Riksbank raised policy rates by 75 basis points between September 2007 and April 2008. A long period of growth had led to high rates of capacity utilisation and tight labour markets in all three countries. This resulted in domestic price pressures in addition to those arising from higher food and energy prices.

Strong growth and rising inflation were also recorded in Switzerland. In contrast to other central banks, the Swiss National Bank does not express its policy stance in terms of overnight rates but instead attempts to steer three-month Libor in a predetermined corridor. The surge in term spreads in the money market in the middle of August and subsequent months introduced a large wedge between the rates paid on the central bank's weekly repurchase operations and its policy rate. As a consequence, three-month Libor rose to levels well above the 2.5% midpoint of the corridor in late August and early September. At its meeting on 13 September, the Swiss National Bank's Board decided to lift the target corridor by 25 basis points to 2.25–3.25%, thus bringing it in line with the rates already observed in the market. To achieve

... gave way to easing in some countries ...

... but higher policy rates in others

Switzerland a special case

this target, given higher term premia, the central bank reduced the rates on its repo operations substantially.

In other economies, in particular the euro area and Japan, policy rates remained unchanged. The ECB chose to put further interest rate increases on hold despite inflationary pressures in view of the weakening in the economy and the appreciation of the euro. However, it repeatedly stressed that second-round effects from the spike in inflation would not be tolerated. Similarly, the Bank of Japan refrained from raising interest rates in late 2007 because of increased downside risks to growth. At the same time, the Policy Board confirmed its intention to lift rates once deflation was clearly overcome and the economy was following a path of sustainable growth.

Unchanged policy rates in the euro area and Japan

#### *Different economic conditions or different approaches to policy?*

These differences in the path of policy rates across countries and currency areas during the second half of 2007 and early 2008 reflect, to varying degrees, differences in the economic situation, differences in the extent of financial stress and differences in central banks' strategies for dealing with high-cost/low-probability scenarios.

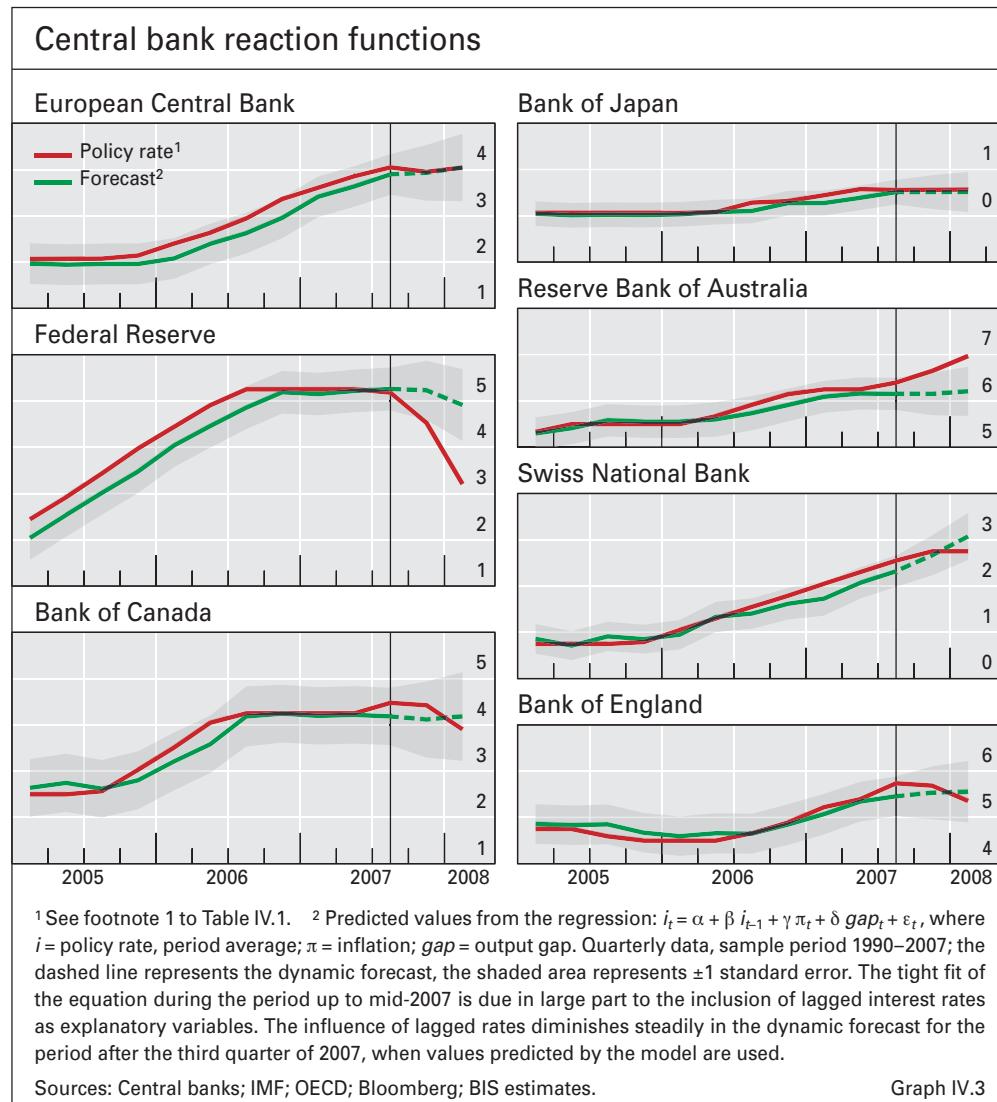
Different policy paths across countries ...

Although the weakening in worldwide demand and the rise in commodity prices were felt in every economy, their precise impact differed markedly across countries. For example, rising commodity prices stimulated economic activity in commodity-producing economies such as Australia, Canada, New Zealand and Norway, but dampened it elsewhere. Similarly, their effect on inflation depended on exchange rate movements and on the degree of capacity utilisation, among other factors.

Estimates of central bank reaction functions indicate that, with some exceptions, central banks responded to changes in economic conditions during the second half of 2007 and early 2008 in roughly the same way as in previous years. Dynamic forecasts based on simple equations linking policy rates to output gaps and inflation as well as lagged policy rates (to account for interest rate smoothing) are able to explain the path of policy rates relatively well in Canada, the euro area, Japan, Switzerland and the United Kingdom (Graph IV.3). The estimates thus suggest that the behaviour of those central banks was broadly in line with that observed in the past. By contrast, the Reserve Bank of Australia increased and the Federal Reserve decreased policy rates by more than predicted on the basis of their past responses to changes in the output gap and inflation. For these central banks, it appears that something not present in the equations, perhaps a shift in the economic outlook not reflected in contemporaneous output gaps and rates of inflation, must have influenced policy in a decisive way.

Changes in relative economic conditions appear to have some explanatory power for differences across central banks (Graph IV.4). Most of the central banks that raised policy rates or held them constant also lifted their inflation forecasts by a greater amount than the central banks that lowered rates. Similarly, larger downward revisions in growth forecasts were generally associated with relatively larger degrees of policy easing. However, the fit is not perfect. In particular, the Reserve Bank of Australia sharply reduced its

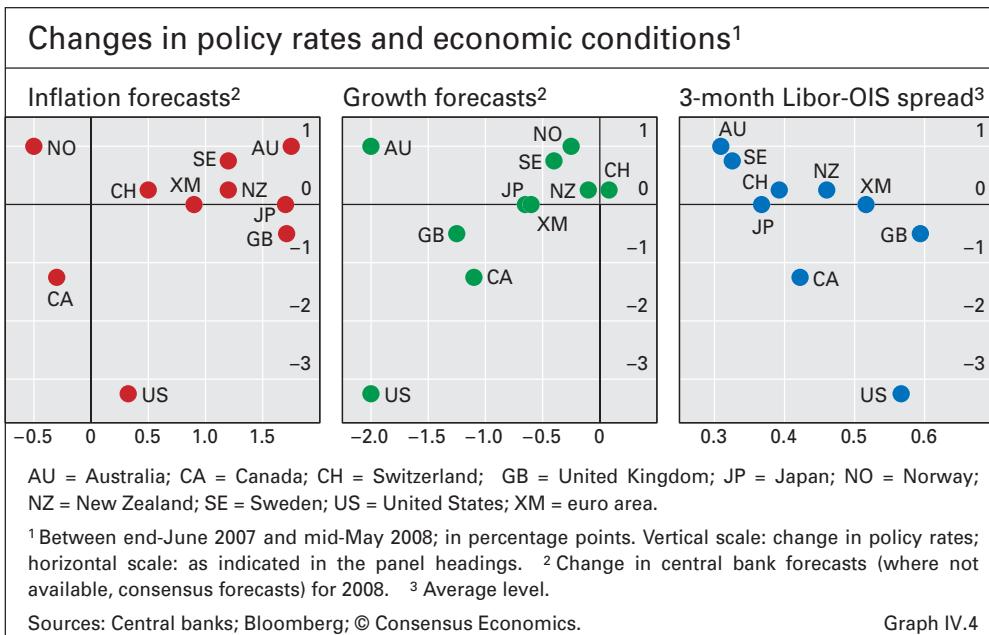
... reflecting differences in economic conditions ...



growth forecast and the Central Bank of Norway cut its inflation forecast, yet both central banks increased policy rates. In part, this might reflect some endogeneity, with revisions to forecasts reflecting the slowing induced by higher policy rates.

Another reason for the different policy responses was that not all countries were hit equally hard by the turbulence in financial markets. Taking the average spread between three-month Libor and overnight index swaps (OIS) of the same maturity in a particular currency as a measure of the severity of the turmoil, there appears to be a close relationship between changes in policy rates and the extent of dislocation in money markets. For example, the Australian and Swedish money markets were less affected by the turbulence than the corresponding US dollar and sterling markets. This is consistent with the fact that the Reserve Bank of Australia and the Riksbank increased policy rates whereas the Federal Reserve and the Bank of England cut them. The correlation between the extent of the dislocation and the relative easing of policy remains even after controlling for the revisions in the forecasts for output and inflation (not shown).

... differences in the extent of financial dislocations ...



The finding that a measure for tensions in the money market has some explanatory power for changes in interest rates, even when forecast revisions are controlled for, could indicate that central banks also responded to the perceived risks to these forecasts. All central banks pay attention to risks to their outlook to some degree when taking monetary policy decisions, although the precise nature of the risks considered during the period under review, and the effect they had on policy, varied greatly across institutions. Some central banks focused primarily on avoiding the risk of a serious downturn in the immediate future, whereas others were more concerned about the implications of easier policy for future macroeconomic outcomes.

Among the central banks of the major advanced industrial economies, the Federal Reserve perhaps falls most clearly into the category of those putting particular emphasis on wanting to prevent the possibility of a serious downturn. This risk management approach to monetary policy was an important factor behind the interest rate reductions by the Federal Reserve seen over the period, as was repeatedly pointed out in the minutes of FOMC meetings and the statements by FOMC members.

Policymakers at the Bank of Japan have arguably been the most explicit in emphasising the possible longer-term implications of their monetary policy choices. The second perspective of their “two-perspective” framework for determining policy focuses on risks to the outlook beyond the two-year horizon. In late 2007, the Policy Board had concluded that the second perspective, by itself, pointed to tighter policy given the potential for overborrowing and excessive fixed investment if market participants believed that interest rates would remain low for an extended period of time. However, by March 2008, at least one member of the Policy Board reasoned that the second perspective highlighted downside risks to growth and inflation and hence the advisability of easier policy to avoid the re-emergence of deflation.

... and differences in the assessment of risks

The Federal Reserve as a macroeconomic risk manager

The Bank of Japan’s “two perspectives” put emphasis on longer-term risks

Most other central banks seemed to place less emphasis on the risks of possible extreme outcomes. Nevertheless, they still had to balance concerns about a larger than expected rise in inflation, which might lead to inflation expectations becoming unanchored, with the risk of a sharper than anticipated slowdown in economic growth.

#### Differences in mandates

Current and projected economic conditions as well as the risks surrounding forecasts are clearly important factors shaping policy decisions, but differences in beliefs about how the economy operates and differences in mandates also appear to play a role. For example, the dual mandate of the Federal Reserve, with its equal emphasis on output and inflation, would seem to call for a sharper easing in response to the turmoil than a mandate with no explicit obligation to support output. Conversely, the ECB's policy of holding rates steady despite the deceleration in economic activity is in line with the priority given in its mandate to achieving price stability.

## Developments in central bank communication

#### Challenges for communication

The uncertainty associated with the financial turbulence and its impact on the world economy posed substantial challenges for central banks' communication strategies. In particular, they had to ensure that an easier path for monetary policy would not be taken as implying a weakened determination to control inflation or as a decision to "bail out" banks. In addition, central banks had to be aware that their communication could itself affect the trajectory of the financial turbulence, which depended critically on market participants' confidence. The first part of this section reviews some general changes in the communication policy of several central banks during the past year; the second part focuses on communication concerning the provision of liquidity during the turbulence.

#### *Changes in monetary policy communication*

Several central banks modified their communication strategies during the year under review in order to increase the public's understanding of the reasoning behind their monetary policy decisions. This continued the decade-long trend towards greater central bank transparency.

#### Revised communication policy at the Riksbank ...

In May 2007, well before tensions emerged in the money market, Sveriges Riksbank announced that it would provide more information about the reasoning behind its policy decisions. It would hold a press conference after every monetary policy meeting – not only after changes in interest rates or the publication of a Monetary Policy Report, as in the past – and in the minutes would attribute remarks made during the meeting to individual members of the Executive Board. Only a few months before, in February, the Riksbank had decided to publish the Board's projections on the future path of policy rates (see the *77th Annual Report*). As part of its new communication strategy, the Riksbank also decided to cease giving guidance on future interest rate moves in speeches and press releases between meetings, as the newly provided information was seen as making such communications unnecessary. However, this last change was partly revised in May 2008 in the light of feedback from

market participants. While stopping short of preannouncing future policy moves, the Riksbank decided that it would be useful to comment on new economic developments and data releases in terms of how they affect its outlook.

Two other major modifications to communication frameworks – at the Federal Reserve and the Reserve Bank of Australia – were also in train well before the financial tensions flared up. Central to the new communication strategy of the Federal Reserve, announced in mid-November 2007, was the release of the economic projections prepared independently by each FOMC participant four times a year, rather than just twice. As in the past, the projections would be prepared under the assumption of “appropriate” monetary policy. The Federal Reserve would publish the range and central tendency of these forecasts as well as some explanation of the underlying reasoning. The forecast horizon of the projections was also extended to three calendar years in order to convey to the public the FOMC participants’ evaluation of the long-term behaviour of the US economy. Notably, this extension could give a clearer idea of the level of inflation that FOMC participants thought consistent with the dual objective of maximum employment and price stability. In the event, the range of 1.6–1.9% for PCE inflation in 2010, indicated by the central tendency of the October forecasts, was largely in line with market participants’ prior beliefs about the FOMC’s inflation objective.

... the Federal Reserve ...

The new communication strategy of the Reserve Bank of Australia, unveiled in December 2007, involved the publication of an explanation of interest rate decisions, even when rates remained unchanged, as well as the release of minutes of the Board meetings on monetary policy. Until then, the Reserve Bank had refrained from explaining no-change decisions since such decisions often (but not always) meant that the Bank had no new information to impart. In the light of the experiences in other countries, however, it decided that the benefits of publishing no-change statements would outweigh the associated risks.

... and the Reserve Bank of Australia

The increased uncertainty about the outlook for inflation and economic growth during the period under review also led to some changes in communication tactics at some major central banks. As uncertainty about the outlook increased, central banks found it more difficult or less desirable to provide guidance on likely future interest rate decisions. For example, the ECB Governing Council left rates unchanged at its September 2007 meeting even though the President had used the term “strong vigilance” in his press conference after the meeting the previous month. The use of this term had infallibly foreshadowed each of the increases in policy rates since 2005. In the United States, the Federal Reserve ceased giving an explicit assessment of the balance of risks in the statement released after the December 2007 meeting of the FOMC in view of the high degree of uncertainty associated with the economic outlook and also provided no such assessment in statements following subsequent meetings.

Less signalling of imminent policy decisions

### *Communication in financial crises*

As in a number of past crises, the first action taken by several central banks during the recent turmoil was to convey to the public that they were monitoring

Reassuring the public ...

the situation closely and would take appropriate steps. Statements along these lines were issued by the ECB and the Bank of Canada on 9 August, for example. Such communications can be more beneficial than actually providing funds if they serve to increase market participants' confidence that the situation is under control.

... through joint  
communiqués

The joint communiqués issued by a number of central banks in December 2007 and in March and May 2008 elicited positive, albeit short-lived, market responses. As well as specifying the measures that individual central banks would take, they demonstrated the central banks' willingness and ability to take coordinated action in response to the turmoil. One challenge for central bank communication in response to a financial crisis is the possibility that extraordinary actions will be interpreted by the public as an indication that the situation in a particular country is worse than had been feared. By issuing joint communiqués, central banks may have reduced this "negative signalling" risk, since joint actions do not highlight conditions in any specific currency area.

Explaining central  
bank operations

Central bank communication was also motivated, in part, by a need to explain central bank operating procedures, in particular when innovative facilities were put in place. Another challenge was to convince the public that, taken by themselves, extraordinary liquidity operations did not represent a change in the stance of monetary policy. On the contrary, all central banks involved were very careful to distinguish between setting interest rates on the one hand, and policies designed to redistribute reserves and improve market liquidity – the subject of the next section – on the other.

### Central bank operations in response to the financial turmoil

The turmoil  
necessitated  
adjustments to  
operations

Central banks adjusted their monetary policy operations in a number of extraordinary and unprecedented ways in response to the financial turmoil that flared up in August 2007 (Table IV.2). When the tensions spilled over into the interbank money market in the middle of the month, the demand for central bank reserves in the economies affected became more volatile and less predictable. This made it appreciably harder for central banks to implement a given monetary policy stance through standard open market operations and standing facilities, the main instruments for day-to-day policy implementation. Moreover, term interbank markets, which play a key role in the financial system and the monetary transmission mechanism, came under pressure as investors became hesitant to place funds in unsecured money markets at anything other than the shortest horizons. Finally, liquidity deteriorated in many secured funding markets, including, in March 2008, dollar-denominated short-term repurchase agreements. This made it difficult for institutions to finance their holdings of what had become highly illiquid assets. All of these developments called for, and were to some extent amenable to, central bank intervention. This section discusses, in turn, how central banks adjusted their reserve management operations in order to maintain control of overnight interest rates, the steps they took to replace impaired sources of funding, and some issues raised by central banks' responses to the turmoil.

Steps taken during the financial turmoil							
	ECB	BoJ	Fed	RBA	BoC	SNB	BoE
Exceptional fine-tuning (frequency, conditions)	✓	✓	✓	✓	✓	✓	✓
Exceptional long-term open market operations	✓	✓	✓	✓	✓	✓	✓
Front-loading of reserves in maintenance period	✓			●	●	✓	
Change in the standing lending facility			✓				
Broadening of eligible collateral			✓	✓	✓	✓ <sup>1</sup>	✓
Change in banks' reserve requirements/target balances				●	●		✓
Broadening of counterparties			✓				✓ <sup>2</sup>
Increasing or initiating securities lending			✓				✓

ECB = European Central Bank; BoJ = Bank of Japan; Fed = Federal Reserve; RBA = Reserve Bank of Australia; BoC = Bank of Canada; SNB = Swiss National Bank; BoE = Bank of England; ✓ = yes; blank space = no; ● = not applicable.

<sup>1</sup> Entered into effect on 1 October, but not linked with the turmoil. <sup>2</sup> Only for four auctions of term funding announced in September 2007, for which, however, there were no bids.

Source: Central banks.

Table IV.2

### Reserve management

As discussed in Chapter VII, the financial turmoil made banks both highly uncertain of their future funding needs and far less confident of their ability to meet potential needs quickly because of illiquidity in money markets. Banks thus became much more cautious in their liquidity management. As a result, the demand for central bank reserves became more volatile and less predictable.

Central banks implement monetary policy through regular short-term market transactions designed to keep the supply of reserves (deposits of banks at the central bank) near the level demanded by banks, thereby keeping reference market rates near policy targets. As the unstable demand for reserves made it more difficult to accurately project the necessary supply, central banks made compensating adjustments to their reserve-providing operations. The Reserve Bank of Australia, the Bank of Canada, the ECB, the Bank of Japan, the Swiss National Bank, the Federal Reserve and, from September, the Bank of England conducted market operations that were either outside their regular schedule or in larger than usual amounts, and took other steps to equilibrate demand and supply for central bank reserves at the policy rate. For example, as the turmoil began, the ECB and the Federal Reserve modified their operations in response to sharp upward pressure on overnight rates amidst profound uncertainty about the demand for reserves. In its first operation in response to the turmoil, on 9 August, the ECB took the unusual step of meeting all demand at its policy rate of 4%. On 10 August, the Federal Reserve held three separate auctions of overnight repurchase agreements,

Unstable demand  
for reserves ...

... addressed by  
more frequent and  
larger operations

#### Role of reserve remuneration

with the final auction occurring in the early afternoon, well after its usual operating time.

In most cases, central banks did not inject more reserves than were needed to maintain reference rates near policy rates. In all regions significantly affected by the turmoil, banks' demand for overall precautionary holdings of *liquid instruments* went up, but the extent to which that resulted in increased demand for *central bank balances* specifically depended on the opportunity cost of such balances. In the United States, where no interest is paid on reserve balances, and in the euro area, where deposits beyond minimum requirements are remunerated at 100 basis points below the policy rate, the demand for central bank reserves did not rise appreciably and net injections were in nearly every case fairly quickly reversed. The main exception was the early August maintenance period in the United States, where for a few days reserves were not drained and the federal funds rate averaged well below the target rate. By contrast, at the Bank of England, where target reserve balances are set by the individual banks in advance and are remunerated at the policy rate, balances went up substantially starting with the September maintenance period. At the Reserve Bank of Australia and the Bank of Canada, where deposit rates are only 25 basis points below the policy rate, deposits rose, but only by modest amounts.

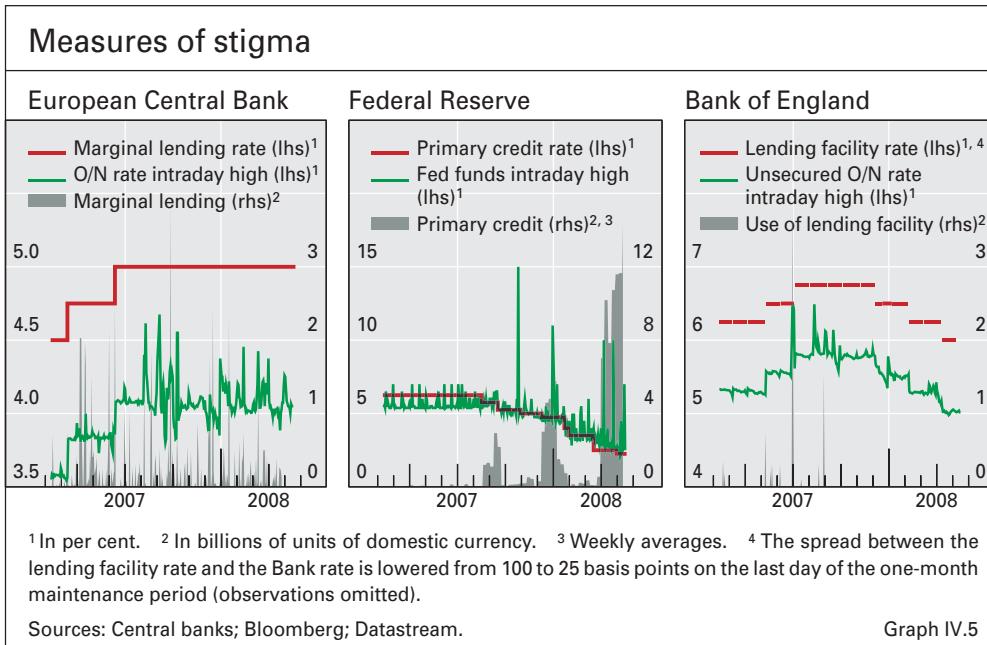
#### Standing facilities as liquidity backstops ...

Almost all central banks have standing loan facilities that extend collateralised loans to banks at a rate above the policy rate. These facilities can serve multiple purposes. One is to act as a backstop to open market operations in the implementation of monetary policy. Borrowing at the facility injects additional reserves on demand and so the lending rate tends to be a cap on the overnight interbank rate. Another role is to provide funds to institutions that are experiencing idiosyncratic account management problems. Yet another is to supply liquidity to institutions temporarily unable to raise funds but otherwise sound. A final role, typically fulfilled by a separate facility, is to provide funds necessary to work out the resolution of a troubled institution.

In the event, only the Federal Reserve eased the terms on its standing loan facility (the primary credit facility) in response to the turmoil. It narrowed the spread between the interest rate on the facility – the “discount rate” – and its policy rate from 100 to 50 basis points in August, and then to 25 basis points in March 2008. It also extended the allowable maturity on the loans from overnight to 30 and then to 90 days. The changes were designed to give banks greater assurance about the cost and availability of funding. The narrower spread was intended to reduce the degree to which any transitory tightness in the interbank market would drive up the federal funds rate, while the longer allowable maturity made these loans a closer substitute for term money market credit, which had become increasingly scarce.

#### ... hampered by stigma

However, the effectiveness of the Federal Reserve's standing loan facility, both for putting a cap on overnight rates and for relieving term money market pressures, was greatly reduced by banks' unwillingness to borrow from it. Even though information on individual discount window borrowing is not released to the public, banks appear to have been concerned that their borrowing could have become known and then taken as an indication of financial difficulties.



Banks at times bid for overnight interbank loans and 30-day eurodollar deposits at rates many percentage points above the discount rate (Graph IV.5). In the United Kingdom, too, there were anecdotal reports that bilateral trades took place at elevated rates, particularly after the provision of emergency liquidity assistance to a distressed mortgage lender, Northern Rock, in September (see Chapter VII). In contrast, “stigma” was less of an issue in the euro area, perhaps because borrowing under the ECB’s marginal lending facility has historically been seen as unexceptional. Thus, in the euro area there were no reported interbank trades at higher rates.

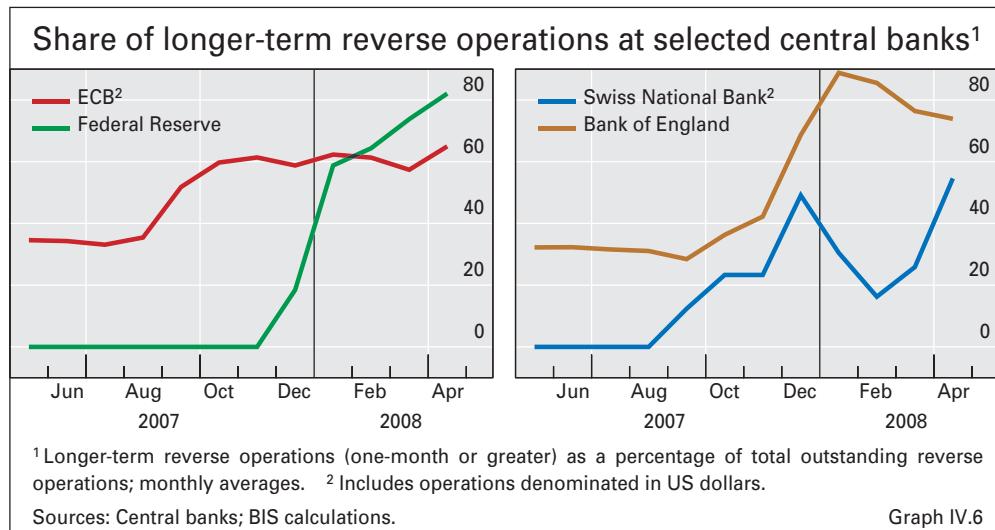
#### *Replacing impaired sources of funding*

In part, the steps taken to keep overnight rates near policy targets were intended not only to implement the monetary policy stance, but also to address the relative supply shortfall in term money markets. Specifically, financial institutions might be more inclined to lend term funds if they were confident of financing the term loans at reasonable rates in the overnight market. Moreover, they would bid less aggressively for term funds if they considered overnight funds to be a reliable substitute.

Pressure in term money markets ...

As the turmoil unfolded, however, the focus of central banks’ efforts to alleviate the pressures in term money markets shifted towards providing term funding directly. For instance, the ECB and the Swiss National Bank conducted supplementary three-month financing operations beginning in August and September, respectively, and the ECB added six-month tenders beginning in April. Starting in December, the Bank of England offered three-month tenders in larger amounts than normal and the Federal Reserve extended one-month loans to sound institutions under its new Term Auction Facility (TAF). These operations significantly increased longer-term reverse (loan or repo) operations as a proportion of all reverse operations at these central banks (Graph IV.6).

... induced a shift to longer-maturity operations ...



Central bank operations re-established control over reference rates and helped ease pressures in term money markets in large part by addressing the poor distribution of reserves resulting from the reduced functioning of the interbank market. In several cases, central banks widened the range of eligible collateral, and in some cases extended the list of counterparties with whom they transact, making it possible for market participants to finance instruments whose markets faced severe dislocation. The Bank of Canada decided in August to accept temporarily as collateral for its market operations all securities that were already eligible for its standing liquidity facility. In September and October, the Reserve Bank of Australia extended the list of collateral eligible for its regular operations and its overnight repo facility to include a broader range of bank paper, as well as residential mortgage-backed securities and asset-backed commercial paper. Starting in September, the Bank of England offered the first of four special three-month tenders against a wider range of collateral than normal and to a broader set of counterparties. In December, it also expanded the range of collateral it accepted in its regular three-month operations. Also in December, the Federal Reserve's TAF provided market-priced funding to depository institutions against discount window collateral, thus effecting a significant widening of the eligible counterparties and collateral relative to the Federal Reserve's other open market operations.

The TAF was one of many central bank actions undertaken by the central banks from five currency areas (the Bank of Canada, ECB, Swiss National Bank, Federal Reserve and Bank of England) following a joint announcement on 12 December. Another was the establishment of currency swap lines between the Federal Reserve, on the one hand, and the ECB and the Swiss National Bank, on the other. The latter two central banks used the lines to finance regular auctions of term dollar funding in their own jurisdictions. The proceeds helped banks in the euro area and Switzerland meet their dollar funding needs, which they had found more difficult because of a dislocation in the forex swap market (see Chapter V). European banks' desire to secure

... and changes in eligible collateral

International joint initiatives in December 2007 ...

dollar funding early in the US trading session had resulted in considerable upward pressure on overnight rates in the morning, complicating the Federal Reserve's efforts to implement its policy stance. After the initiation of the dollar auctions, those pressures dissipated for a while. The auctions by the European central banks of term dollar funds continued through January, but were suspended in February when market conditions seemed to improve.

The respite was short-lived, however. In mid-March, financial market conditions deteriorated further, and central banks took a number of additional steps to fund illiquid assets held by financial institutions. The Federal Reserve raised the amount of TAF financing substantially and extended the maximum maturity of its repos from two weeks to one month. Furthermore, the same central banks that had taken coordinated measures in December made a joint announcement of additional initiatives. The transatlantic swap lines were increased in size, and the ECB and Swiss National Bank renewed their auctions of dollar loans. Moreover, the Federal Reserve initiated a new Term Securities Lending Facility (TSLF), which allowed primary dealers (the 20 or so large securities dealers that participate in open market operations) to borrow Treasury securities from the Federal Reserve Bank of New York in exchange for certain less liquid securities, including some highly rated private mortgage-backed securities that were not eligible for open market operations.

Over the following days, the Federal Reserve used its authority to lend to non-depository institutions for the first time since the 1930s. First, on 14 March, it provided financing to facilitate the acquisition of investment bank Bear Stearns, which was on the brink of bankruptcy, by JPMorgan Chase. Then, on Sunday 16 March, it established the Primary Dealer Credit Facility (PDCF), which provides overnight loans at the discount rate to primary dealers against a list of highly rated private and public securities. The facility was designed to make it easier for primary dealers to supply financing (via repos) to participants in markets for securitised products. While the TAF had extended a type of open market operation to the institutions with access to the discount window, the PDCF extended a standing loan facility to those institutions that participate in open market operations. In consequence, the two new facilities moved the Federal Reserve's operational framework in the direction of offering both market operations and standing facilities to the same, broad set of institutions and against a more uniform set of collateral.

In mid-April, the Bank of England also introduced a securities swap arrangement in an effort to help improve the liquidity position of banks burdened with an overhang of now illiquid assets. Specifically, the Bank introduced a Special Liquidity Scheme – a facility through which banks could swap high-quality but temporarily illiquid assets for UK Treasury bills. The swaps were made available for any period within a six-month window and with maturities extending up to three years. And in early May, there was another joint announcement by the major central banks. The transatlantic swap lines and associated dollar auctions were again increased in size, and the Federal Reserve widened the list of securities it accepts in the TSLF to include other types of highly rated asset-backed securities.

... and again in  
March 2008

Fed lending to  
non-depository  
institutions

Bank of England  
introduced  
securities swap  
arrangement

At present, it is difficult to gauge the effectiveness of central bank operations in response to the financial turmoil. Central banks were able to contain the pickup in volatility in targeted market interest rates despite the less predictable demand for reserves and the reduced effectiveness of some standing loan facilities for putting a cap on rates. But term money market spreads remain very high by historical standards, even after allowing for some upward adjustment from what may have been unjustifiably low levels prior to the turmoil. Some of the elevation in spreads no doubt reflects counterparty credit concerns, which cannot be allayed on a broad scale by central bank interventions. However, term spreads have stayed elevated even while credit spreads for financial institutions have narrowed. This suggests that concerns about liquidity have not been wholly overcome, even by the unprecedented central bank actions to date.

*Issues raised by central banks' response to the financial market turmoil*

There are costs to intervention ...

When deciding whether or not to intervene to address a financial crisis, central banks must confront a trade-off, since interventions carry costs as well as benefits. Some of these costs may be direct financial costs, such as those incurred when providing an ex post guarantee to institutions or investors. Others, which are arguably more important in the longer term, are related to the moral hazard associated with intervention: the possibility that market participants will take on more risk, increasing the likelihood and possible costs of future interventions, once they know that central banks will intervene to support them.

Different types of central bank actions entail different degrees of moral hazard and financial costs. Among the steps taken during the recent turmoil, more active reserve management within existing frameworks, designed to keep reference market rates near policy targets, most likely entailed the least moral hazard. Expanding collateral and counterparty lists probably involved a relatively greater degree of moral hazard and some financial risks, although the former should in principle have been contained to some extent by conducting the related operations for the most part as market transactions with prices determined in auctions. With respect to financial risk, the pool of collateral pledged to central banks did become somewhat riskier and less liquid, but any increase in risk to the central banks is likely to have been modest, in part because of the larger haircuts applied to riskier or less liquid assets when determining the amount of credit the central bank is willing to provide against them. The moral hazard consequences were probably the greatest in the case of the loans provided to help resolve troubled institutions. Typically, in such circumstances, central banks seek to impose costs on shareholders, creditors and management that are as high as possible while allowing the institution to stay open. Inevitably, though, the costs to shareholders and creditors are lower than they would have been if there had been a disorderly failure.

... and also benefits ...

The principal benefit of intervening is that it can prevent or mitigate a developing financial crisis. Financial crises can result in a significant curtailment of credit availability and deterioration in business and household confidence. The ensuing declines in economic activity, employment and

wealth substantially reduce social welfare. Calculating this benefit requires an assessment not only of the possible costs avoided, but also of the odds that potential intervention strategies will be effective.

Another benefit of certain types of central bank action to stem a financial crisis is that it may help reduce the eventual need for other kinds of actions that entail even greater moral hazard or financial costs. For example, early and aggressive steps to inject liquidity using market transactions may make emergency assistance in the form of loans later on unnecessary.

It may not be possible to calculate very precisely in real time the likely costs and benefits of particular actions in response to what is often a rapidly evolving situation. In the end, decisions will call for a substantial amount of judgment. Even so, defining objectives in advance and delineating the prospective costs and benefits of acting are important preparatory steps that can help to structure and facilitate even the most expeditious decision-making.

Recent interventions to promote the smooth functioning of term money markets and repo markets could also engender the view that central banks will intervene to support other markets or institutions in similar situations of financial distress in the future. This view could further increase moral hazard. Public clarity from central banks about their objectives and principles for dealing with financial market disruptions could help limit such “mission creep”. Preplanning exit strategies from extraordinary operations might also be helpful.

It is certain that the next financial crisis will have characteristics that are unexpected and will require some central bank responses that cannot be prepared in advance. Hence, it will probably not be possible to design operational frameworks that include a complete set of contingency arrangements. To some extent, successful management of financial crises will depend on central banks preserving their capacity to innovate. In this regard, maintaining strong contacts with market participants, good channels of communication with other financial agencies and central banks and a well informed staff will be important in ensuring that information on new situations can be rapidly collected, shared and understood.

... including  
avoiding more  
costly intervention  
later on

Difficult to weigh  
costs and benefits  
in real time ...

... but clarity about  
objectives may  
limit mission creep

Response will  
always require  
innovation

## V. Foreign exchange markets

### Highlights

Foreign exchange markets experienced a substantial increase in volatility in August 2007 as a consequence of significant dislocations in other financial markets. This marked an important change in the factors driving market developments. Prior to August, historically low volatility and large interest rate differentials had underpinned cross-border capital flows that put downward pressure on funding currencies, such as the yen and the Swiss franc, and supported high-yielding currencies, such as the Australian and New Zealand dollars. Subsequently, as a result of the heightened volatility, leveraged cross-currency carry trades were unwound, which led to some reversal of the previous exchange rate trends for the currencies involved.

In addition, there was a substantial reassessment of expected monetary policy actions as the dimensions of the problems in financial markets became more apparent. In this environment, factors such as expected growth differentials, which have an important bearing on the future path of monetary policy, became more of a focal point for market sentiment than the prevailing level of interest rates. Heightened expectations of a recession and worsening credit market conditions in the United States intensified the depreciating trend in the US dollar in the early part of 2008, with the dollar reaching a 12-year low against the yen as well as all-time lows against the euro and the Swiss franc. Deteriorating growth prospects for the United Kingdom towards the end of 2007 also led to a significant depreciation of sterling. In contrast, a number of other currencies were buoyed by expectations of continued strong economic growth. For some emerging market economies, such as China and Singapore, appreciation pressures stemmed from strong domestic demand and limited direct exposure to the turmoil in global financial markets. In other cases, such as Australia and Brazil, currency strength was underpinned by robust commodity exports and improvements in the terms of trade.

Notwithstanding some significant exchange rate movements, foreign exchange spot markets generally continued to function smoothly throughout the period of higher volatility. At the same time, there were signs of strain in some foreign exchange swap and cross-currency swap markets, which are more closely related to credit markets and cross-border funding. This suggests that while certain longer-term developments, such as the broadening of the investor base and improved risk management, are likely to have made foreign exchange markets more robust, the close relationship between certain segments of foreign exchange markets and other financial markets can leave the former susceptible to shocks emanating from the latter.

## Developments in foreign exchange markets

The dislocations in credit and money markets that unfolded over the course of July and August 2007 led to significant changes in the exchange rate trends that had prevailed in much of 2006 and in the first half of 2007. These changes were accompanied by a sharp pickup in volatility in many currency pairs.

After June 2007, the steady depreciation of the US dollar quickened. During 2006 and the first six months of 2007, the US dollar had depreciated against the euro at an annualised rate of 9% and appreciated marginally against the yen (Graph V.1). Between the beginning of July 2007 and the end of April 2008, the annualised rate of depreciation increased to around 20% against both currencies. In nominal effective terms, the rate of depreciation more than doubled (Graph V.2). Similarly, sterling depreciated by almost 15% in effective terms between July 2007 and April 2008. Other currencies, such as the Russian rouble, depreciated steadily in nominal effective terms over this period.

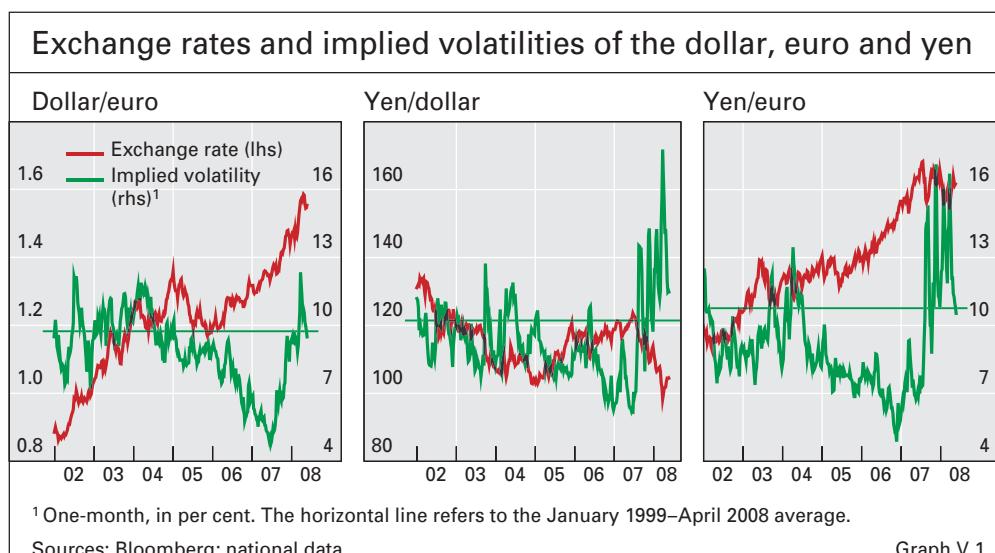
In contrast, a number of other currencies appreciated in effective terms in the second half of 2007 and into 2008. Most notably, the annualised rate of appreciation of the euro more than doubled after August 2007 (Graph V.2). Mid-2007 also marked a turning point for the yen and the Swiss franc. Having depreciated in 2006 and the first half of 2007, these currencies appreciated over the 10 months to April 2008 by 15% and 9%, respectively. Several Asian currencies, including the renminbi, Singapore dollar, New Taiwan dollar and Thai baht, also rose markedly in the first four months of 2008.

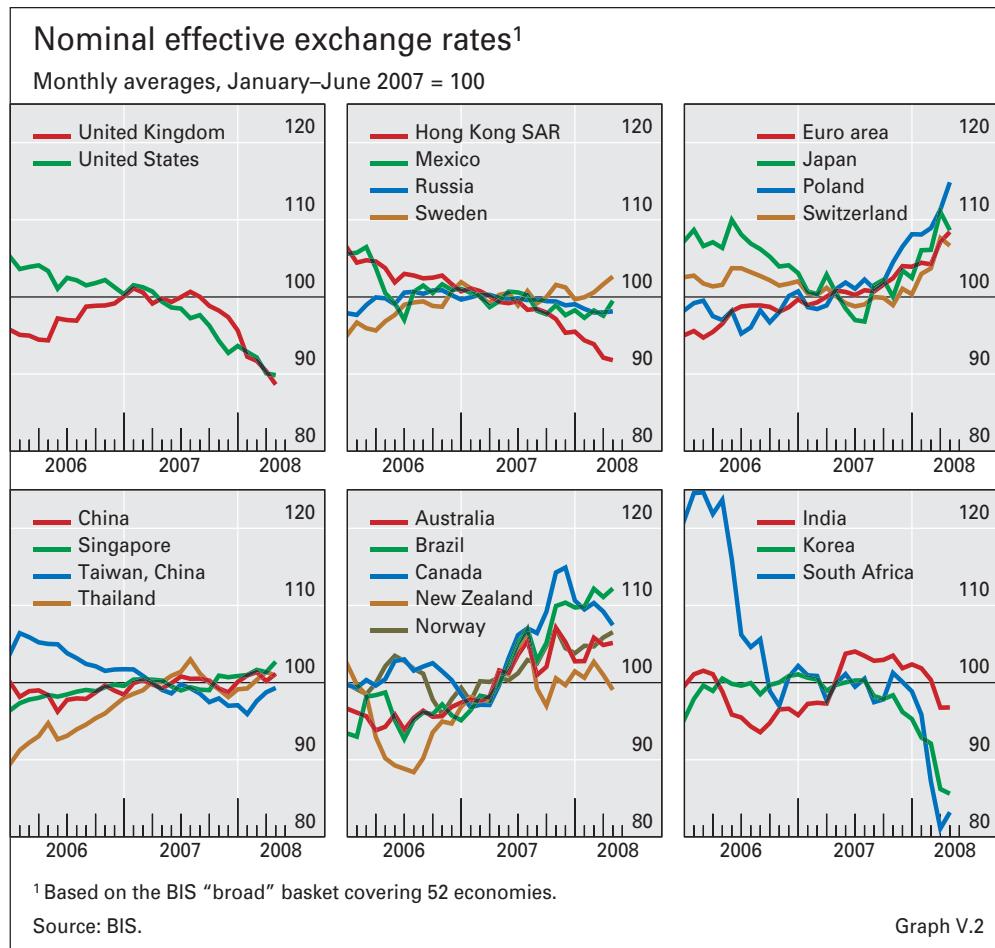
Some currencies experienced sizeable fluctuations between mid-2007 and April 2008. A few, such as the Australian dollar and the Brazilian real, depreciated sharply in mid-August 2007 in the wake of the problems in international money markets, only to recover lost ground over the following couple of months (Graph V.2). Others, such as the New Zealand dollar, made only modest gains following sharp falls in August. Finally, some currencies that had proved to be relatively resilient in August, including the Canadian dollar, Indian rupee, Korean won and South African rand, depreciated more substantially between November 2007 and April 2008.

The US dollar and  
sterling depreciated  
after mid-2007 ...

... while the euro,  
yen and Swiss  
franc appreciated

Other currencies  
fluctuated  
considerably





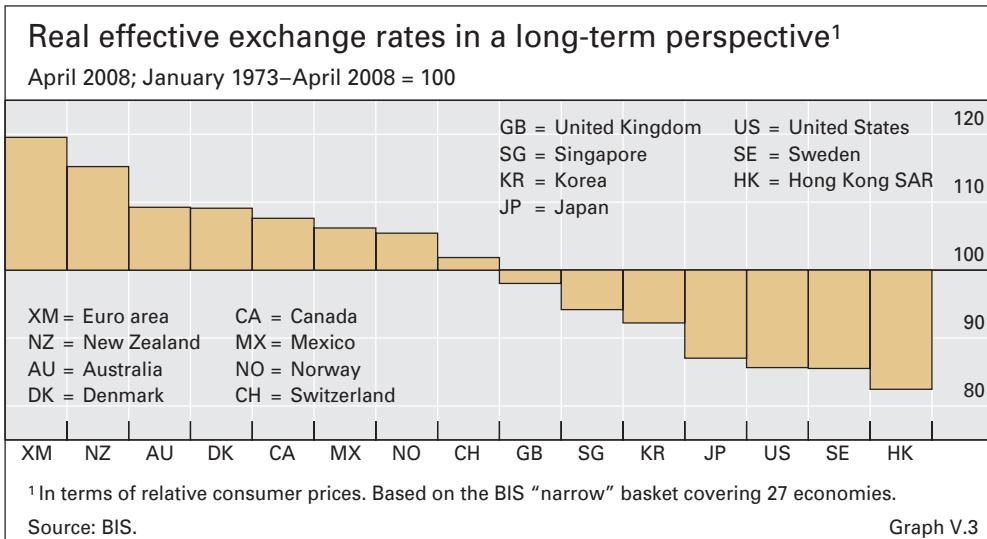
Some currencies departed significantly from their historical averages

From a longer-term perspective, many currencies are currently at levels that are significantly different from their long-term averages in real effective terms (Graph V.3). In April 2008, the euro and New Zealand dollar were over 10% higher than their long-term averages, while the yen, Hong Kong dollar, Swedish krona and US dollar were more than 10% below theirs. In general, more structural estimates from the IMF of where real exchange rates stand relative to medium-term equilibrium levels provide a broadly similar picture. Notable exceptions are currencies such as the Australian and Canadian dollars, which are likely to be less overvalued than suggested by Graph V.3 due to the positive effects of strong terms of trade on equilibrium exchange rates, and the US dollar, whose depreciation is qualitatively consistent with the large and persistent US current account deficit.

#### *Conditions in foreign exchange markets*

Volatility increased sharply ...

Volatility in foreign exchange markets started to pick up in July 2007, having trended down to historical lows in the first half of the year. Implied volatility rose sharply on three occasions – in mid-August and late November 2007 and in mid-March 2008 – and also experienced a more muted increase at the end of January 2008 (Graph V.4). These peaks coincided with, but were less pronounced than, the peaks in volatility in other financial markets. In contrast to previous experience, the implied volatility of major advanced industrial



country exchange rates consistently exceeded that of emerging market exchange rates from the beginning of August 2007 onwards.

Implied volatility peaked in March 2008 for a number of currency pairs. For the US dollar/euro exchange rate, implied volatility reached a level comparable to the episode of heightened foreign exchange market volatility in September 2001, while volatilities for the dollar/yen and euro/yen were higher than at any point since 1999 (Graph V.1). Other currencies that experienced particularly sharp increases in implied volatility against the US dollar include the Brazilian real, the South African rand and the Australian, Canadian and New Zealand dollars. The peaks for these last three currency pairs are comparable to those seen in October 1998, during the period of volatility associated with the collapse of LTCM and the Russian default.

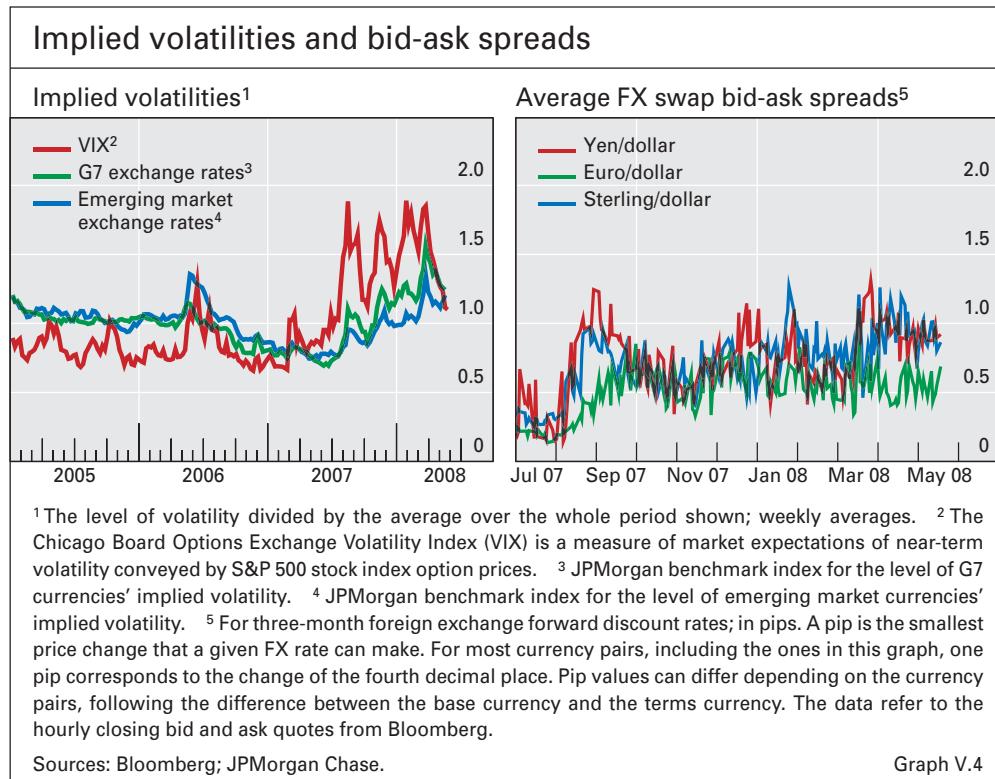
... in some currency pairs more than others

The pickup in volatility was accompanied by higher turnover in the foreign exchange spot market. Turnover of spot transactions executed on the electronic broking platform EBS, which accounts for over 60% of the spot interbank market, peaked at \$456 billion on 16 August 2007. This compares with an average daily turnover of \$182 billion in 2007. Data on foreign exchange settlement values from CLS Bank (CLS), through which final settlement of a large share of all foreign exchange transactions is executed, also show a distinct peak in August 2007, particularly for the yen and the Australian and New Zealand dollars – currencies prominent in carry trades. The increase in turnover does not appear to have been evenly distributed across currency pairs, however. Data from EBS, for example, are dominated by a disproportionately large increase in turnover in the dollar/yen and euro/yen during the week beginning 13 August.

Turnover in foreign exchange spot markets increased

Sustained high levels of turnover and the absence of any significant widening of bid-ask spreads suggest that liquidity in the spot market for major currency pairs was not impaired by the dislocations in other financial markets. There were, however, more apparent distortions in the foreign exchange swap markets. Bid-ask spreads in these markets widened noticeably at times of heightened volatility, and US interest rates derived from foreign exchange

FX swap markets experienced some problems ...



swap prices deviated significantly from actual US dollar Libor (Graph V.4; see Chapter VI). Settlement data from CLS suggest that foreign exchange swap activity in some currency pairs, such as sterling and the New Zealand dollar against the US dollar, fell steadily over the second half of 2007. For most other currency pairs, foreign exchange swap activity was roughly stable in the period under review. These developments are consistent with available turnover data for the United Kingdom and the United States.

... as did cross-currency swap markets ...

Similarly, tensions also became apparent in the market for cross-currency swaps. These instruments are similar to foreign exchange swaps but are more liquid at maturities longer than one year and involve the swapping of interest payments as well as principal in different currencies. They are important for institutions that want to hedge longer-term offshore funding. Cross-currency swap prices for a number of currency pairs moved sharply during certain periods of heightened volatility. Prices for the euro/dollar and sterling/dollar pairs at the one-year tenor and above, for example, swung abruptly into negative territory from the end of August 2007 onwards, indicating a sharp increase in demand for longer-term US dollar funding.

... consistent with a pickup in demand for US dollar funds

The fact that foreign exchange swap and cross-currency swap markets experienced some spillover from the financial market turmoil is not entirely surprising given that transactions in these instruments are closely linked to the money market and are subject to counterparty risk. Indeed, the tensions observed in these two markets were consistent with a pickup in demand for US dollar funding. This may have been attributable in part to efforts by non-US financial institutions to obtain US dollar liquidity by swapping into US dollars from other currencies. Thus, the tensions largely reflected the rapid

deterioration in money market conditions associated with the global credit market turmoil.

## Determinants of exchange rate movements

Against the backdrop of increased financial market volatility and heightened uncertainty surrounding the global economic outlook, the main forces driving exchange rate dynamics shifted. In particular, the role of prevailing interest rate differentials diminished as uncertainty regarding exchange rate trends undermined the attractiveness of carry trades, and attention moved towards expected growth differentials as well as more structural factors, such as current account positions. While exchange rate policies continued to shape the behaviour of some emerging market currencies, developments in commodity prices and specific trends in capital flows also exerted a considerable influence on exchange rates.

### *Interest rate and growth differentials*

In the early part of 2007, the persistence of historically low volatility sustained the focus on prevailing interest rate differentials and carry trades as a major driver of exchange rate developments. In this environment, funding currencies such as the yen and the Swiss franc experienced downward pressure, while high-yielding currencies such as the Australian and New Zealand dollars appreciated. Because the term “carry trade” has been used very loosely in popular discussion, it is important to stress that it refers strictly to *leveraged* trades that exploit large interest rate differentials across currencies and low exchange rate volatility by betting on the failure of uncovered interest parity. In practice, carry trades are typically implemented through a combination of foreign exchange spot and swap transactions to obtain a “synthetic” forward position that is long the high-yielding currency and short the low-yielding currency. This is done synthetically, rather than through an outright forward position, largely for liquidity reasons. Importantly, such trades are leveraged because they do not involve any cash outlay up front.

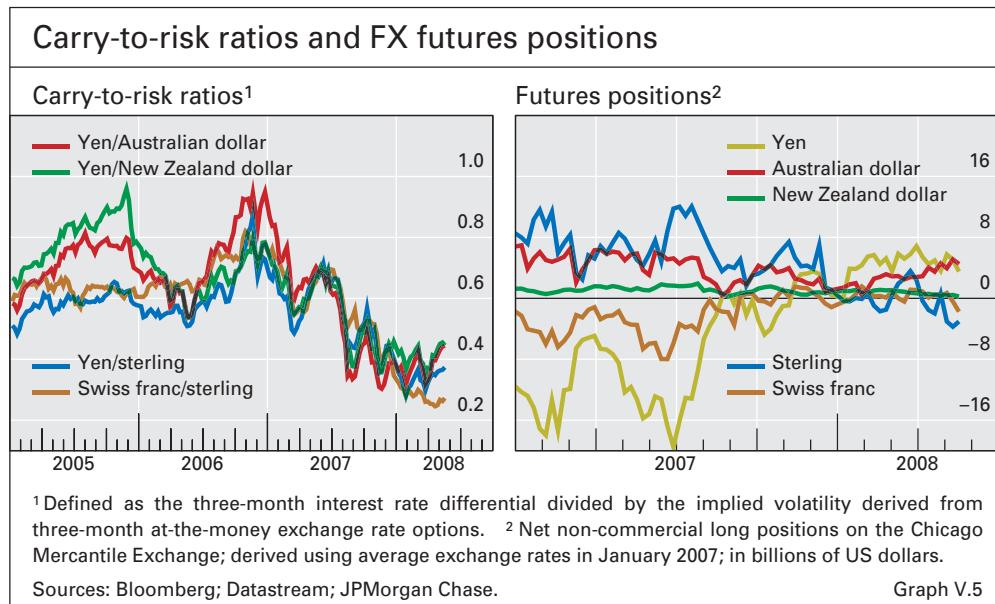
Carry trades were attractive in the first half of 2007 ...

The abrupt dislocations in major financial markets that started in August, and intensified in November, severely curtailed the viability of carry trades. As the broad-based repricing of risk and precipitous drop in risk appetite led to dramatic price falls across a large spectrum of financial assets, exchange rate volatility increased and several currencies involved in carry trades experienced a sharp reversal of previous trends. These developments are consistent with changes in simple indicators of the attractiveness of carry trades such as the carry-to-risk ratio, which measures interest rate differentials adjusted for the expected risk implied by currency options. These indicators fell substantially from July onwards for the currency pairs most associated with carry trades, largely reflecting the upward spike in implied volatilities documented in the previous section (Graph V.5).

... but became less so thereafter ...

While there are no direct data on the size of carry trades, because for the most part they involve off-balance sheet exposures, indirect evidence suggests that substantial unwinding of these strategies took place in the second half of

... and were largely unwound



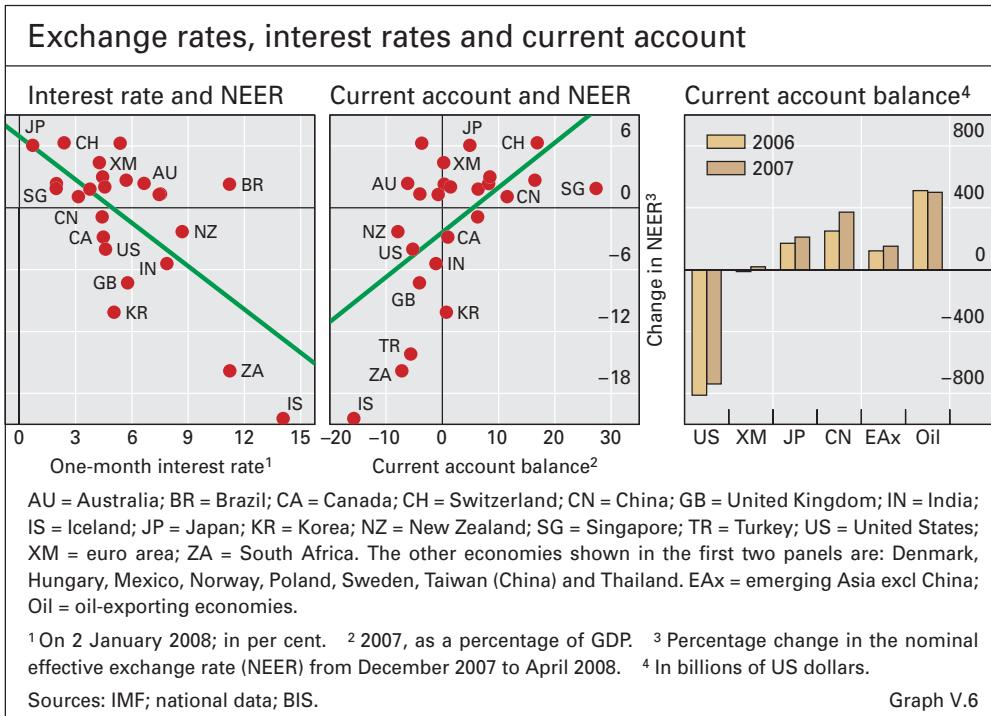
2007. For example, non-commercial open positions in foreign exchange futures on the Chicago Mercantile Exchange indicate that there was an abrupt reduction in net open positions of the main carry trade currencies over this period (Graph V.5). Notably, net speculative positions on the yen actually turned long at the end of 2007. Despite some large swings in exchange rates in mid-August, the unwinding of carry trades did not lead to major dislocations in foreign exchange spot markets as some had feared. Indeed, while the yen did appreciate substantially starting in the latter half of 2007, the Australian dollar, which had been a prime target currency, continued to appreciate despite an initial sharp depreciation (Graph V.2).

As carry trades became less attractive, prevailing interest rate differentials became less of a focal point for market participants. Indeed, the best performing major currencies in the first three months of 2008 in nominal effective terms were the two lowest-yielding currencies, namely the yen and Swiss franc (Graph V.6). Attention shifted instead to other factors, such as growth differentials, that provide information about the future path of monetary policy, which became increasingly uncertain. Notably, despite the extraordinary monetary easing that took place in the United States in January 2008, the US dollar initially displayed surprising resilience and only came under renewed downward pressure as market sentiment regarding prospects for economic growth dimmed markedly in February. The rapid depreciation of sterling towards the end of 2007, and again in March 2008, was also associated with downward reassessments of economic growth.

#### *Current account positions*

... and current account positions

Greater risk aversion also prompted a renewed focus on current account balances. Among the major economies, the United States and the United Kingdom, both of which have sizeable current account deficits, experienced a substantial weakening of their currencies in the early part of 2008. In addition, several small, high-deficit countries such as Hungary, Iceland, South Africa and



Turkey faced significant downward pressure on their currencies as the financial market turmoil intensified at the end of 2007 (Graph V.6). This suggests that investors may have been more reluctant to fund the external borrowing of countries deemed to be vulnerable to capital flow reversals in an environment of higher volatility and lower risk appetite. Given that many of these countries also had high interest rates, the downward pressure on their currencies may, to some extent, have reflected an unwinding of carry trade positions. From a broader perspective, developments in the major currencies during the period under review – particularly the depreciation of the US dollar and appreciation of the yen – are consistent with a narrowing, or at least a stabilisation, of global imbalances (Graph V.6).

#### Exchange rate policy

Exchange rate intervention by central banks continued to exert an important influence over a number of currencies. Official foreign exchange reserves expanded by over \$1.3 trillion in 2007, a markedly faster pace than in the previous year (Table V.1). The bulk of the increase continued to be concentrated in Asia, in particular China, but the rate of accumulation more than doubled in Latin America, driven primarily by a very sharp rise in Brazilian reserves. Russia, along with several other oil-exporting countries, also continued to register large increases in reserves. Current account surpluses and sustained capital inflows were again the key forces driving reserve accumulation in emerging market economies, with countries in Latin America, in particular, experiencing a substantial influx of capital in the second half of 2007 (see Chapter III). Despite this growth in reserves, the exchange rates of those countries that undertook some of the most sizeable intervention, namely China and Brazil, still appreciated notably (Graph V.2).

Reserve accumulation gathered pace ...

Annual changes in official foreign exchange reserves							
	In billions of US dollars						
	2002	2003	2004	2005	2006	2007	Memo: Amounts outstanding (Dec 2007)
At current exchange rates							
Total	358.6	617.1	723.1	426.2	862.0	1,356.0	6,392.8
Advanced industrial economies	117.4	216.2	198.0	-23.1	102.1	97.5	1,501.2
United States	4.8	5.9	3.0	-4.9	3.1	4.9	45.8
Euro area	8.0	-27.6	-7.0	-14.0	16.9	19.4	203.5
Japan	63.7	201.3	171.5	4.5	46.1	73.4	948.4
Asia	173.9	264.1	363.7	250.2	396.0	694.9	2,912.6
China	74.2	116.8	206.7	208.9	247.5	461.9	1,528.3
Hong Kong SAR	0.7	6.5	5.2	0.7	8.9	19.5	152.6
India	21.7	30.6	27.5	5.9	39.2	96.4	266.6
Indonesia	3.7	4.0	-0.0	-1.8	7.9	13.9	54.7
Korea	18.3	33.7	43.7	11.8	28.4	23.4	261.8
Malaysia	3.8	10.4	22.1	4.5	12.3	18.9	100.6
Philippines	-0.2	0.3	-0.5	2.8	4.1	10.2	30.1
Singapore	6.4	13.9	16.4	3.9	20.1	26.7	162.5
Taiwan, China	39.4	45.0	35.1	11.6	12.9	4.2	270.3
Thailand	5.7	2.9	7.5	2.0	14.6	20.0	85.1
Latin America <sup>1</sup>	4.2	30.6	21.1	25.4	53.7	126.7	397.2
Argentina	-4.1	2.7	4.9	4.7	7.7	13.8	44.2
Brazil	1.6	11.7	3.6	0.8	31.9	94.3	179.4
Chile	0.8	0.4	0.3	1.2	2.5	-2.5	16.7
Mexico	5.5	7.8	5.0	10.2	2.4	10.9	86.3
Venezuela	-0.8	7.5	2.3	5.6	5.5	-5.2	23.7
CEE <sup>2</sup>	24.2	21.1	21.4	15.3	26.0	42.2	223.6
Middle East <sup>3</sup>	0.7	5.7	12.8	17.0	26.2	34.5	135.9
Russia	11.5	29.1	47.6	54.9	119.6	168.7	464.0
<i>Memo:</i>							
<i>Net oil exporters<sup>4</sup></i>	27.7	67.0	100.0	114.8	216.2	255.2	958.8

<sup>1</sup> Countries shown plus Colombia and Peru. <sup>2</sup> Central and eastern Europe: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. <sup>3</sup> Kuwait, Libya, Qatar and Saudi Arabia. For Saudi Arabia, excluding investment in foreign securities. <sup>4</sup> Algeria, Angola, Kazakhstan, Mexico, Nigeria, Norway, Russia, Venezuela and the Middle East.

Sources: IMF; Datastream; national data.

Table V.1

... but at more apparent financial and economic costs

With the US dollar depreciating considerably, the costs associated with an exchange rate regime tied closely to that currency became more apparent. This fuelled speculation about a possible change in the exchange rate policies pursued by a number of countries. Particular attention was focused on the Gulf states, where the persistent decline in the US dollar, and the associated loosening of monetary conditions that this entailed, reinforced the effects of large gains in these countries' terms of trade and contributed to rising inflation. In May 2007, Kuwait abandoned its US dollar peg, which had been in place since 2003, and moved to tracking a basket of currencies. By the end of April 2008, the Kuwaiti dinar had appreciated by 8% against the US dollar but remained relatively stable in nominal effective terms. Subsequent speculation

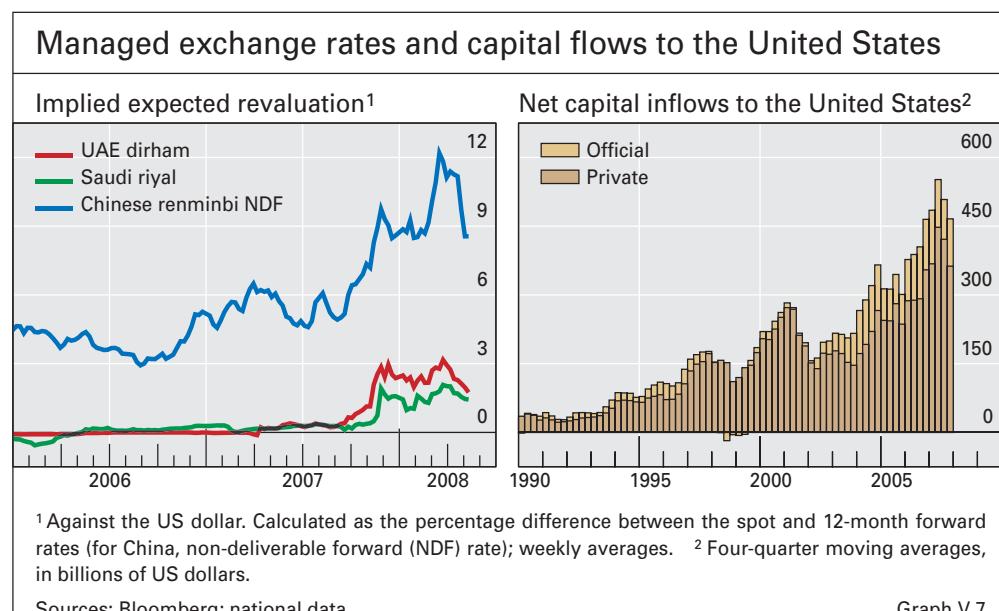
focused on Saudi Arabia, the United Arab Emirates and Qatar as the most likely candidates to follow suit (Graph V.7). There were strong price pressures in these economies, and high-ranking officials in the latter two countries made statements indicating that a possible adjustment to the exchange rate regime was under study. At the same time, China recorded its highest rate of inflation in over 11 years and the renminbi posted fresh highs against the US dollar, encouraging speculation that China might be sanctioning a faster rate of appreciation of its currency (Graph V.7). Sharp reductions in US interest rates and the accelerated depreciation of the US dollar also increased the financial costs of reserve accumulation. This contributed further to the perception that central banks might face pressure to curtail intervention activity.

Against this backdrop, market analysts also highlighted the possibility of major reallocations of official foreign reserves away from the US dollar. While net official inflows into the United States are small relative to net private inflows, they can be significant because of their potential to act as an anchor for private sector expectations (Graph V.7). Thus, news about prospective shifts in official flows and stocks can sometimes move markets. That said, the currency composition of foreign reserves tends to move gradually. IMF data on the composition of foreign reserves show that in the fourth quarter of 2007 the US dollar remained the dominant currency choice, accounting for roughly 64% of total allocated reserves, a share essentially unchanged from that recorded a year earlier.

Other notable developments in exchange rate policy were not directly related to US dollar weakness. In Hungary, the central bank abandoned the forint's trading band against the euro in favour of a free float in February 2008. After an initial spike reflecting the surprise nature of the move, the exchange rate fell back somewhat before a subsequent rally left it roughly unchanged against the euro at end-April 2008 compared to the start of the year. In Thailand, the central bank in March 2008 lifted capital controls that had been

Potential shifts in reserve composition remained in focus

Exchange rate policies were changed in some countries



in place since December 2006, citing more orderly market conditions and difficulties in enforcing the controls.

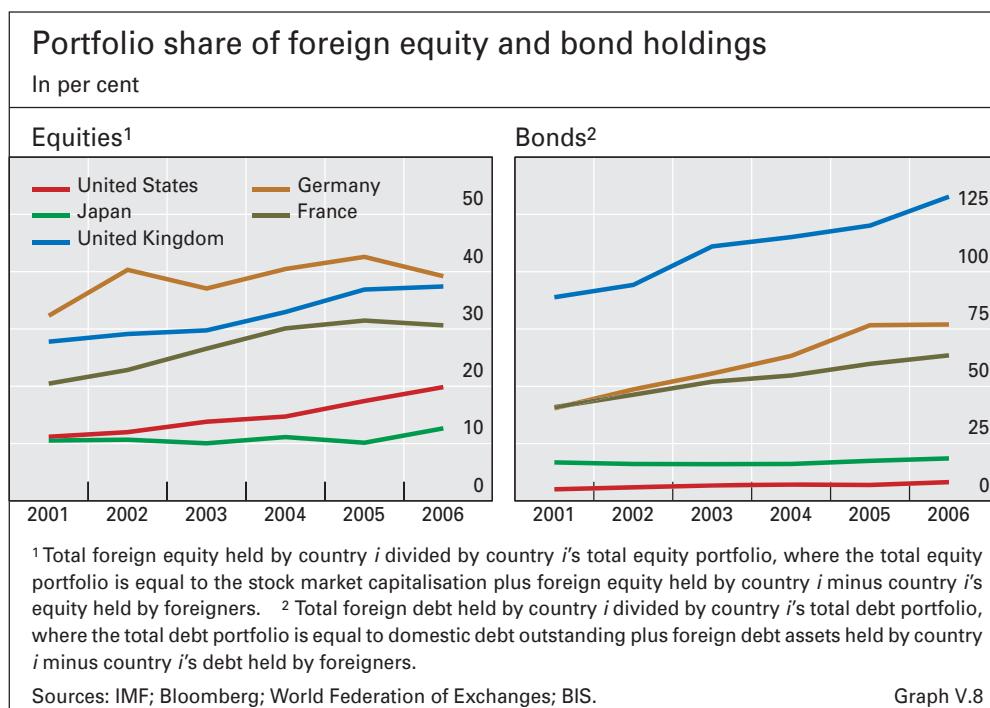
### *Trends in capital flows*

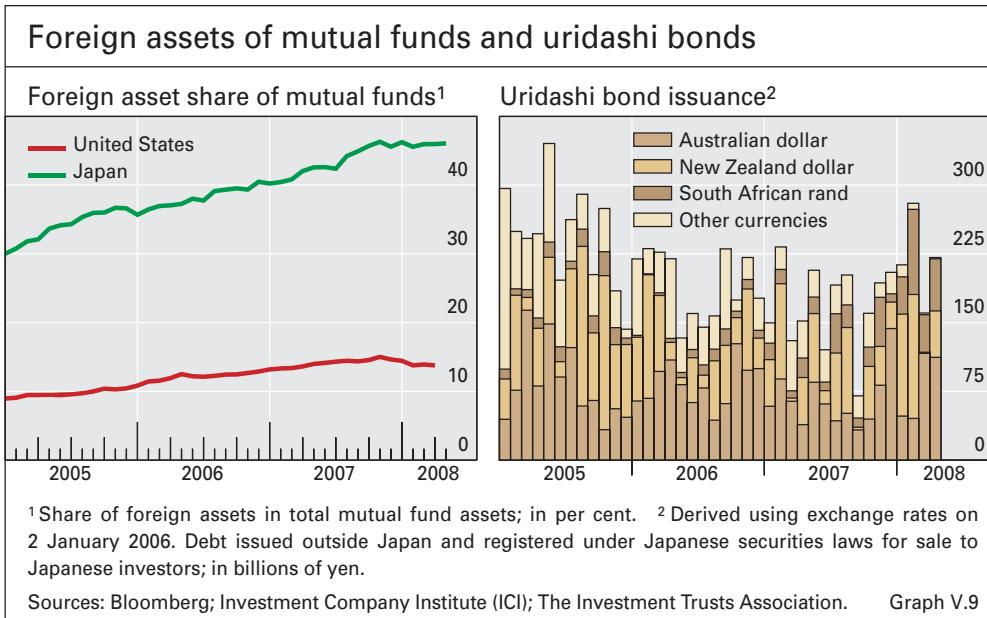
The trend towards international diversification has been strong ...

... particularly in Japan and the United States

The trend towards increased international diversification of assets has underpinned sizeable shifts in the pattern of capital flows across countries over the past five years or so. Easier access to international investment opportunities and greater emphasis on returns by investors in many countries have contributed to a reduction in the extent to which domestic investors overweight domestic assets in their portfolios, also known as "home bias". These forces continued to exert a significant influence on exchange rates in the period under review.

While a precise estimate of the degree of home bias across countries is hampered by a lack of data, proximate indications can be obtained by examining trends in investor behaviour. The IMF's Coordinated Portfolio Investment Survey (CPIS) provides useful information about the evolution of the international allocation of portfolio investments for a large number of countries. It indicates that, for major market economies, the shares of foreign equities and bonds relative to total equity and bond portfolios have been on an upward trend since 2001 (Graph V.8). With respect to equity investments, the shift towards greater allocation to foreign assets by residents of Japan and the United States appears to have accelerated in recent years. More timely data indicate that this trend continued into 2007, with the proportion of mutual funds in Japan and the United States that invest in foreign assets remaining on a firm upward path until mid-2007 (Graph V.9). Since the beginning of the disruptions to financial markets, these shares appear to have stabilised rather than reversed.





In Japan, the purchase of foreign currency bonds by retail investors is another striking example of this diversification trend. Issuance of these securities, also known as uridashi bonds, has been driven by strong demand among Japanese retail investors, especially for bonds denominated in high-yielding currencies such as the Australian and New Zealand dollars (Graph V.9). Such investments continued to generate sustained capital outflows from Japan in 2007, with a notable pickup in South African rand-denominated uridashi bonds in the latter half of the year and into the early part of 2008.

Foreign currency bonds have also been popular in Japan

The pronounced expansion in the share of foreign asset holdings in Japan and the United States may be partly a reflection of the fact that, historically, the degree of home bias in these two countries has been relatively large. In the case of the United States, the disproportionate focus on domestic assets in the past may have been related to the exceptional depth and breadth of local financial markets, which allowed significant diversification opportunities without recourse to foreign assets. With respect to Japan, the fact that the decline in home bias has taken place in conjunction with regulatory changes such as the privatisation of the postal savings system, greater availability of alternative investment vehicles and changes in demographic trends suggests that foreign asset diversification was inhibited in part by structural factors. More cyclical forces, such as the sustained appreciating trend of the yen in the 1980s and 1990s, which made overseas investment less profitable, are also likely to have played a role. Indeed, the pickup in international diversification has coincided with a period of prolonged yen weakness since 2004, as well as exceptionally low domestic interest rates.

Historically, the degree of home bias has been high in Japan and the United States

The trend towards increased international diversification has had a significant effect on exchange rate movements. At the margin, the pickup in outward investment by domestic residents is likely to have put downward pressure on the respective national currencies. With respect to the US dollar,

The diversification trend has had a significant impact on exchange rates

however, the outsize weight of the United States in global financial markets makes it likely that a reduction in home bias in other countries has been associated with a disproportionately large increase in foreign investment in US assets that counterbalanced increased outward investment by US residents, leaving the net effect on the US dollar ambiguous.

#### *Commodity prices*

Strong commodity prices supported some currencies

The sharp run-up in commodity prices was a major driver of currency movements for a number of countries in the period under review. Large improvements in the terms of trade helped to support the currencies of diversified commodity exporters such as Australia and Brazil. This was particularly evident in the case of the Australian dollar, which remained strong despite the substantial unwinding of carry trades that took place in the second half of 2007. High oil prices also generally supported the currencies of energy-exporting nations such as Canada and Norway, although the former experienced some weakness towards the end of 2007 as its economic outlook dimmed. While the Russian rouble reached its highest level in over nine years against the US dollar in March 2008, it fell steadily in nominal effective terms throughout 2007.

### Resilience of the foreign exchange market – a longer-term perspective

As noted above, the impact of the extraordinary global financial market turbulence during the period under review was not uniform across different segments of the foreign exchange market. From a longer-term perspective, there have been a number of notable developments that potentially have a bearing on the resilience of foreign exchange markets. They include higher turnover, greater diversity in foreign exchange market activity and improvements in the risk management infrastructure.

#### *Higher turnover and greater diversity of participants*

Turnover has grown considerably

Turnover in the foreign exchange market has continued to expand rapidly in recent years. Between 2001 and 2007, foreign exchange turnover across all instruments increased on average by 18% per annum, to an average daily level of \$3.5 trillion (Table V.2). Spot transactions increased steadily at an annual rate of 17% over the same period, while the market for foreign exchange swaps saw tremendous growth, with turnover almost doubling between 2004 and 2007.

Currency composition has become more diverse

At the same time, the currency composition of foreign exchange turnover has become more diversified. The most recent Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity shows that the US dollar continues to be the dominant currency in foreign exchange markets, being on one side of around 86% of all foreign exchange transactions in April 2007. However, the share of the three most traded currencies – the US dollar, euro and yen – fell between 2001 and 2007. Currencies that experienced significant increases in their share of turnover over this period include the Australian, Hong Kong and New Zealand dollars and the Norwegian krone. More broadly,

## Global foreign exchange market turnover<sup>1</sup>

Daily averages in April, in billions of US dollars

	1992	1995	1998	2001	2004	2007
Spot transactions	394	494	568	387	631	1,005
Outright forwards	58	97	128	131	209	362
Foreign exchange swaps	324	546	734	656	954	1,714
Currency swaps	...	...	10	7	21	32
Foreign exchange options	...	...	87	60	117	212
Other foreign exchange derivatives	...	...	0	0	2	0
Estimated gaps in reporting	44	53	53	30	90	151
Total	820	1,190	1,580	1,270	2,025	3,475
<i>Memo: Turnover at April 2007 exchange rates</i>	<i>880</i>	<i>1,150</i>	<i>1,750</i>	<i>1,510</i>	<i>2,110</i>	<i>3,475</i>

<sup>1</sup> Adjusted for local and cross-border double-counting.

Source: BIS Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007.

Table V.2

the share of emerging market currencies, notably the renminbi and the Indian rupee, also rose over the same period.

There have also been notable changes in the composition of participants in foreign exchange markets. Data from the triennial survey show a marked increase in the presence of non-reporting financial institutions, a category which includes such entities as hedge funds, insurance companies and pension funds (Table V.3). Between 2004 and 2007, the growth in this segment of the market accounted for more than half of the rise in aggregate foreign exchange turnover and almost half of that in spot transactions.

There are cyclical and structural explanations for this relatively rapid growth in turnover with non-reporting financial institutions. On the cyclical side, investor activity was encouraged up to 2007 by low volatility and exchange rate trends, which generated attractive risk-adjusted returns in foreign exchange markets over much of the past six-year period. The international diversification of household portfolios discussed above is also likely to have been a contributing factor, not just in terms of the initial diversifying purchase but possibly also with regard to the hedging of foreign exchange risk on an ongoing basis. In addition, there have been at least three significant structural changes resulting not only in higher turnover, but also in greater diversity of the participants that make up this segment.

First, there has been substantial growth in the prime brokerage business. A prime broker, typically a large bank, provides its customers with a range of services, including the ability to trade with counterparties – subject to credit limits and collateralisation – in the prime broker's name. This has enabled customers, typically small financial institutions such as hedge funds, to use the prime broker's credit rating and thereby access liquidity at lower cost than would otherwise have been possible. In return for accepting the customer's credit risk, prime brokers receive fee-based income and have more opportunities to sell other products. Prime brokerage grew rapidly in the late 1990s and early 2000s and the industry has become more competitive, with

Financial customers have become increasingly important ...

... for both cyclical ...

... and structural reasons, including: growth in prime brokerage;

## Reported foreign exchange market turnover by counterparty<sup>1</sup>

Daily averages in April, in billions of US dollars

	1998	2001	2004	2007
Spot transactions with:				
Reporting dealers	347	218	310	426
Other financial institutions	121	111	213	394
Non-financial customers	99	58	108	184
Aggregate turnover with:				
Reporting dealers	614	503	707	966
Other financial institutions	178	235	421	945
Non-financial customers	166	115	169	409

<sup>1</sup> Adjusted for local and cross-border double-counting. Excludes estimated gaps in reporting. Due to incomplete counterparty breakdown, the components listed in this table do not always add to the totals published in the triennial survey.

Source: BIS Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007.

Table V.3

fees falling substantially. From the perspective of market depth, the growth in this business has enabled hedge funds to participate more actively in foreign exchange markets, although the recent financial market turbulence may have curtailed the extent to which prime brokers make credit available to these institutions.

algorithmic trading;

Second, there has been a rapid expansion in the use of automated trading, also known as algorithmic trading. Spurred by the emergence of electronic trading systems, this has allowed some financial institutions, notably hedge funds, to take advantage of new trading strategies, such as high-frequency trades. At the same time, many financial institutions have also been able to use algorithmic trading strategies to increase efficiency. For example, small spot trades can be diverted to “auto-trading engines”, freeing up human traders to spend more time on complex trades, while hedging trades can be automated to improve risk management. Estimates of the significance of algorithmic trading range from over 20% for spot transactions, which are relatively straightforward, to negligible for foreign exchange options, which are less homogeneous. Most market commentary indicates that algorithmic trading has been growing rapidly since 2005.

and demand from retail investors

Third, the presence of retail investors has increased markedly, particularly in the past five years or so. Some estimates suggest that retail foreign exchange turnover has been growing by around 30% per annum, and now accounts for about 2% of aggregate turnover and about 10% of spot transactions outside the interbank market. Although there is significant retail foreign exchange trading in the United States, much of the growth in this segment in recent years has come from Asia, particularly Japan. The main related innovation stems from retail aggregators, which provide sophisticated web-based interfaces that enable their customers to trade foreign exchange on a margin basis. Retail aggregators typically quote prices with relatively tight spreads over wholesale rates: in the case of the US dollar/euro rate, spreads can be as low as 2 pips. Many retail aggregators outsource liquidity provision

to a large wholesale foreign exchange bank in an arrangement known as “white labelling”. As with algorithmic trading, advances in technology have played a central role in enabling the development of this new market segment.

#### *Improved risk management*

Another key development in recent years has resulted from efforts to improve the management of settlement risk in foreign exchange markets. In 1996, a survey of settlement risk in foreign exchange transactions carried out by the Committee on Payment and Settlement Systems (CPSS) hosted by the BIS had confirmed that some financial institutions faced foreign exchange settlement exposures that were extremely large relative to capital. Given the extent of the exposures and the size of the foreign exchange markets, this situation was deemed to pose a significant risk to the global financial system. In response, the G10 central banks set out a strategy to reduce foreign exchange settlement risk calling for actions by individual banks, industry groups and central banks.

Settlement risk has been of particular concern ...

An important outcome of this strategy was the creation of CLS in 2002 by major private sector participants in foreign exchange markets. CLS provides its members with a payment-versus-payment settlement service which, by ensuring that the two currencies associated with a given foreign exchange transaction achieve final settlement at the same time, eliminates the principal risk that arises when one leg of the trade settles prior to the second leg, as often occurs in traditional correspondent banking settlement. The value of foreign exchange transactions settled through CLS has risen steadily over time. A further survey conducted by the CPSS in April 2006 indicated that CLS was being used to settle roughly 55% of foreign exchange obligations, and that 550 institutions had used CLS to settle trades in 15 currencies, either directly as members of CLS or indirectly as third parties. The CPSS estimates that settlement exposures would have been up to three times higher than reported if other methods such as traditional correspondent banking had been used.

... leading to the creation of CLS ...

While this represents a major reduction in risk, substantial exposures remain. Roughly 32% of foreign exchange related obligations settle through traditional correspondent banking arrangements, with half of this value being at risk overnight, not just intraday. Moreover, there is a potential risk of backslicing, particularly in the face of changing trading patterns and cost pressures, such as those arising from lower-value tickets resulting from algorithmic trading. In the light of this assessment, the CPSS has recommended a number of steps – direct action by individual institutions, new services and education efforts from industry groups, and overall support from central banks – to enable institutions to reduce and/or better control their foreign exchange settlement exposures.

... and other ongoing efforts

#### *Implications for market resilience*

The trends highlighted above have arguably contributed to the resilience observed in the foreign exchange market to date, particularly in the spot market. The continued expansion in turnover, to the extent that it is structural, is likely to have added further to market liquidity, strengthening the market's

Foreign exchange markets are likely to have become more resilient over time ...

ability to absorb large individual trades smoothly without a significant impact on prices. At the same time, the increased diversity of participants, and the associated heterogeneity of opinion that this might be expected to engender, may have contributed to greater market depth. Finally, the reduction of credit exposures generated in the course of the clearing and settlement of interbank foreign exchange contracts is likely to have helped preserve market participants' willingness to enter into transactions, and thus to have provided further depth to the market.

... but risks remain

These developments notwithstanding, there are reasons to maintain vigilance in monitoring developments in foreign exchange markets and to sustain the impetus for better risk management practices. First, the fact that the epicentre of the present turmoil was not the foreign exchange market, and that those market segments most closely related to the turmoil have experienced some disruptions, obviously calls for a degree of caution. Second, the increased market depth arising from the entrance of new players, such as highly leveraged institutions, as well as from the expansion of certain trading techniques, particularly algorithmic trading, may not be without attendant risks. It is possible, for instance, that a spike in risk aversion could lead a majority of market participants to pull back at the same time, thus reducing market liquidity and depth, especially in the context of leveraged trades. As such, part of the observed increase in turnover may constitute "fair weather liquidity" that contributes to market depth in good times but disappears under stress. Finally, while the migration towards CLS has been smooth so far, the system has yet to be fully tested by settlement problems emanating from a major institution in the foreign exchange market.

## VI. Financial markets

### Highlights

During the period from June 2007 to mid-May 2008, concerns over losses on US subprime mortgage loans escalated into widespread financial stress, raising fears about the stability of banks and other financial institutions. What initially appeared to be a contained problem quickly spread across other credit segments and broader financial markets to the point where sizeable parts of the financial system became largely dysfunctional. Surging demand for liquidity, coupled with growing concerns about counterparty risk, led to unprecedented pressures in major interbank markets, while bond yields in advanced industrial economies tumbled as investors sought safe havens amid fears that economic growth would weaken. Equity markets in advanced industrial countries were also weak, with financial shares selling off particularly sharply. A bright spot was emerging financial markets, which in contrast to previous episodes of broad-based asset market weakness proved to be more resilient than those in the advanced industrial economies.

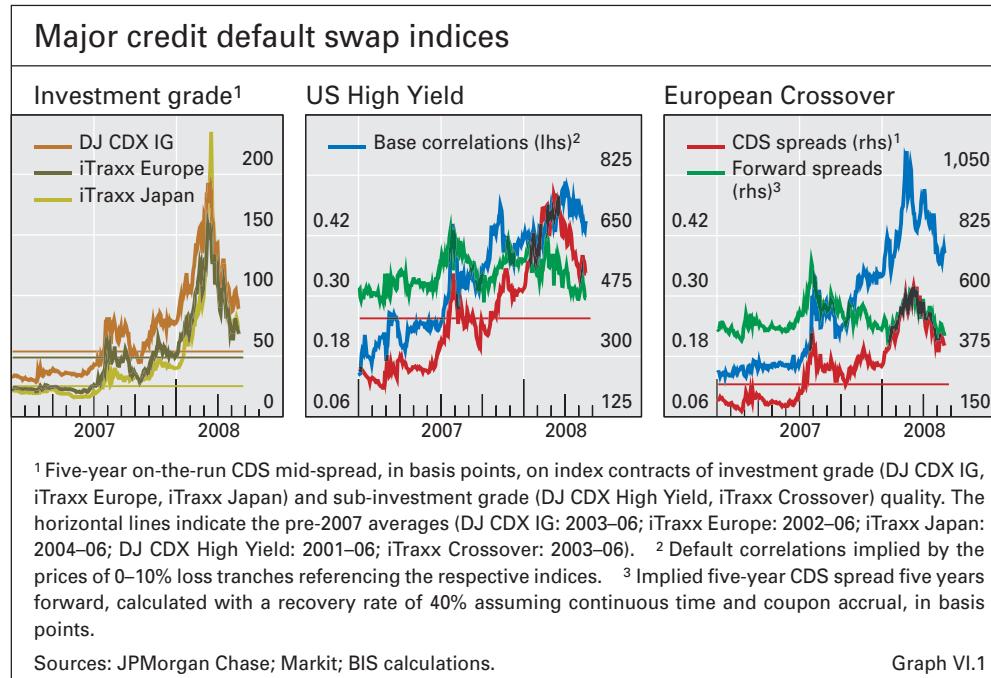
The financial market turmoil unfolded in six stages, starting in mid-June 2007: (i) a dramatic widening of spreads on mortgage products following large-scale rating downgrades on subprime mortgage-backed securities and the closure of a number of hedge funds with subprime exposure; (ii) the extension of the sell-off to a wide variety of credit and other markets from mid-July, including structured products more generally; (iii) the expansion of the turmoil into short-term credit and, particularly, interbank money markets from end-July; (iv) broader problems for the financial sector from mid-October, including for companies such as financial guarantors; (v) increasingly dysfunctional markets against the backdrop of a marked worsening of the US macroeconomic outlook from early 2008, accompanied by rising fears about systemic risks, when spreads of even the highest-quality assets moved out to unusually wide levels; (vi) recovery in the wake of the Federal Reserve-facilitated takeover of a troubled US investment bank in March 2008.

### Anatomy of the credit market turmoil of 2007–08

Global credit markets experienced a large-scale sell-off during the period under review, as broad-based deleveraging combined with uncertainty about the size and valuation of credit exposures. The chain of events started with what appeared at first to be a relatively contained problem in the US subprime mortgage sector, but quickly spread to other markets. In an environment of rather accommodative financial conditions and elevated risk appetite, use of credit derivatives and securitisation technology had aided the build-up of substantial leverage in the financial system as a whole. When this leverage started to be unwound in the face of subprime losses, price deterioration led to margin calls and further deleveraging. With liquidity evaporating, valuations

Credit markets sold off markedly ...

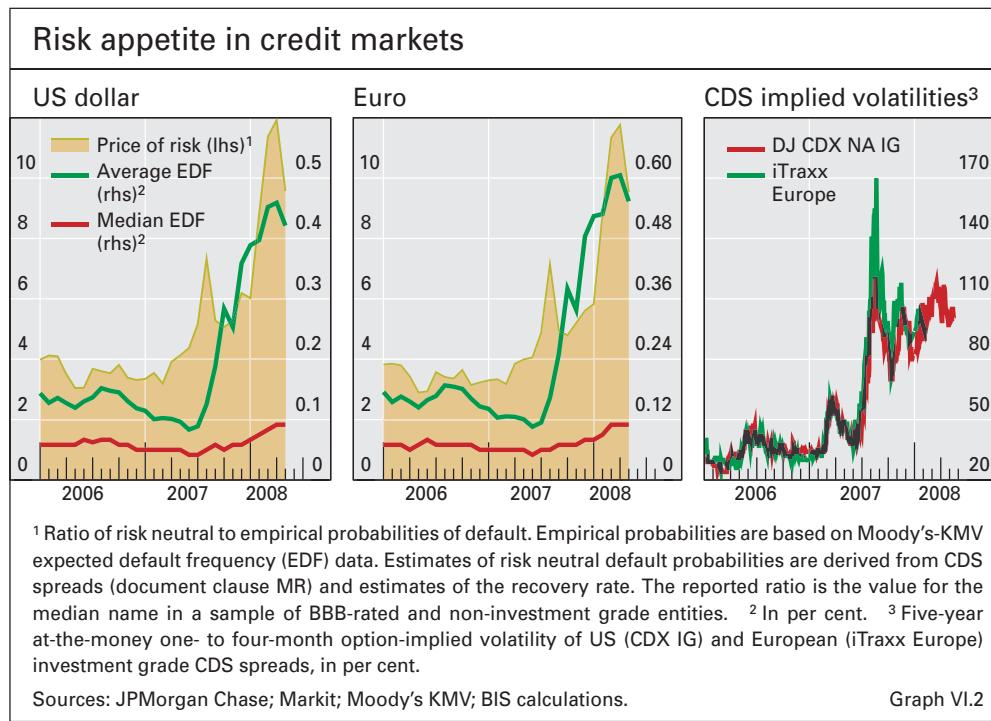
... in what started as a “subprime crisis”



came under greater downward pressure and became increasingly uncertain. The resulting retrenchment of positions across markets triggered a sharp and disorderly repricing of risky assets that continued through much of the period.

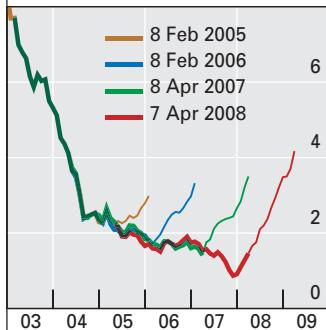
Spreads widened sharply ...

In the process, credit spreads across markets widened markedly from the unusually tight levels observed in early 2007 (Graph VI.1). Rising spreads coincided with a substantial increase in volatilities implied by credit default swap (CDS) index options (Graph VI.2, right-hand panel). After a spike early during the turmoil, volatilities have remained elevated relative to the levels

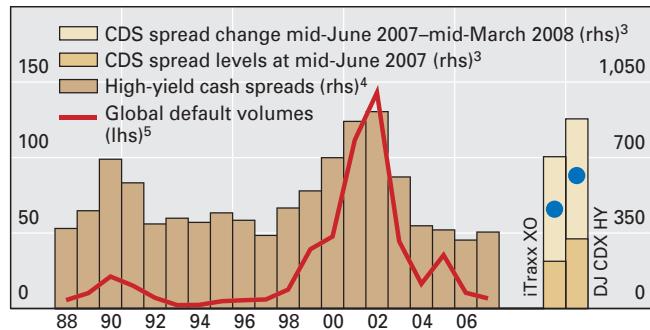


## Corporate spread levels, default rates and default volumes

### Default rates and forecasts<sup>1</sup>



### Spread levels<sup>2</sup> and default volumes



<sup>1</sup> Global 12-month speculative grade default rate forecasts by Moody's at the time of the legend date, in per cent; the thick lines refer to historical default rates; the thin lines refer to forecasts one year ahead. <sup>2</sup> In basis points. <sup>3</sup> Spreads over Treasuries (European Crossover: iTraxx XO and US High Yield: DJ CDX HY), adjusted with five-year swap spreads; the dot indicates the CDS spread level prevailing in mid-May 2008. <sup>4</sup> Average monthly global high-yield bond spreads over Treasuries. <sup>5</sup> Moody's annual global speculative grade corporate bond and loan default volumes, in billions of US dollars.

Sources: Deutsche Bank; JPMorgan Chase; Moody's; BIS calculations.

Graph VI.3

observed since index inception in 2002–03, indicating heightened uncertainty about shorter-run developments. Plummeting investor risk tolerance, in turn, resulted in sharply rising risk premia for credit products (Graph VI.2, left-hand and centre panels). The price of credit risk, as extracted from credit spread-implied and empirical default probabilities of lower-quality borrowers, increased markedly in June and July, and further into 2008.

Even though markets recovered somewhat late in the period under review, credit spreads had risen by mid-May 2008 to levels comparable to the higher range of those seen in earlier cycles, consistent with market perceptions of a pronounced increase in default risk. In recent years, corporate default rates had invariably come in below rating agencies' forecasts, reaching low levels in both relative and volume terms (Graph VI.3). However, in contrast to previous years, the default correlations implied by tranched index products were elevated, suggesting markets placed greater weight on the risks of a sudden rise in default rates. The relative stability of implied forward spreads for the medium and longer term, in turn, indicated that much of this added risk was anticipated for the near term (Graph VI.1, centre and right-hand panels). At the same time, at their widest levels in March 2008, high-yield CDS spreads had remained some 250 basis points below the highest comparable cash market spreads observed in September 2002. This, in combination with easy financing conditions and known slippages in underwriting standards over recent years, suggested room for renewed spread increases should the macroeconomic and financial environment continue to deteriorate (Graph VI.3, right-hand panel).

... and volatilities spiked ...

... to levels consistent with strongly rising default rates

### Stage one: the initial subprime crisis (June–mid-July 2007)

The first of the six stages of credit market turmoil began in mid-June 2007. Signs of an imminent repricing of risk had first emerged in January and February, following a softening of US residential property prices as far back as

## Timeline of key events

2007	
14–22 June	Rumours surface that two Bear Stearns-managed hedge funds invested in securities backed by subprime mortgage loans have incurred heavy losses and that \$3.8 billion worth of bonds are up for sale to finance margin calls. News reports eventually confirm that one of the funds is kept open through a loan injection, while the other is to be liquidated.
10–12 July	S&P places \$7.3 billion worth of 2006 vintage ABS backed by residential mortgage loans on negative ratings watch and announces a review of CDO deals exposed to such collateral; Moody's downgrades \$5 billion worth of subprime mortgage bonds and places 184 mortgage-backed CDO tranches on downgrade review. Fitch places 33 classes from 19 structured finance CDOs on credit watch negative.
30 July– 1 August	Germany's IKB warns of subprime-related losses and reveals that its main shareholder, Kreditanstalt für Wiederaufbau (KfW), has assumed its financial obligations from liquidity facilities provided to an ABCP conduit exposed to subprime loans. A €3.5 billion rescue fund is put together by KfW and a group of public and private sector banks.
31 July– 9 August	American Home Mortgage Investment Corporation announces its inability to fund lending obligations and, one week later, files for Chapter 11 bankruptcy. Union Investment, a German fund manager, stops withdrawals from one of its funds. Three ABCP programmes, including one linked to American Home, extend the maturity of their liabilities, the first ever such extensions. BNP Paribas freezes redemptions for three investment funds, citing an inability to value them in the current environment.
9–10 August	The ECB injects €95 billion of overnight liquidity into the interbank market, marking the beginning of a set of extraordinary moves by the central bank community. The Federal Reserve conducts three extraordinary auctions of overnight funds, injecting a total of \$38 billion, and issues a statement similar to that of the ECB.
13–17 September	Northern Rock, a UK mortgage lender, runs into liquidity problems, which eventually trigger a bank run and the announcement of a deposit guarantee by the UK Treasury.
18 September– 4 November	Repeated writedowns and quarterly losses are reported by major financial institutions. A number of high-profile CEOs leave their positions amid top management reorganisations.
11–23 October	Moody's downgrades some 2,500 subprime bonds issued in 2006, followed by a series of S&P subprime downgrades in the following days. S&P also puts 590 CDOs on ratings watch negative and downgrades 145 tranches of CDOs worth \$3.7 billion; Moody's downgrades 117 CDO tranches later in the same week, and Fitch places some \$37 billion worth of CDOs under review.
24 October– 5 November	Various financial guarantors announce third quarter losses; Fitch announces that it is considering cutting the AAA rating of certain monoline insurers.
12 December	Central banks from five currency areas announce coordinated measures designed to make turn-of-the year funding available to a larger number of institutions.
19 December	ACA, a financial guarantor rated A, is downgraded by S&P to CCC, triggering collateral calls from its counterparties for which repeated waiver periods are negotiated during the following months. S&P's rating outlooks for other monolines are lowered from stable to negative.

Continued on page 96.

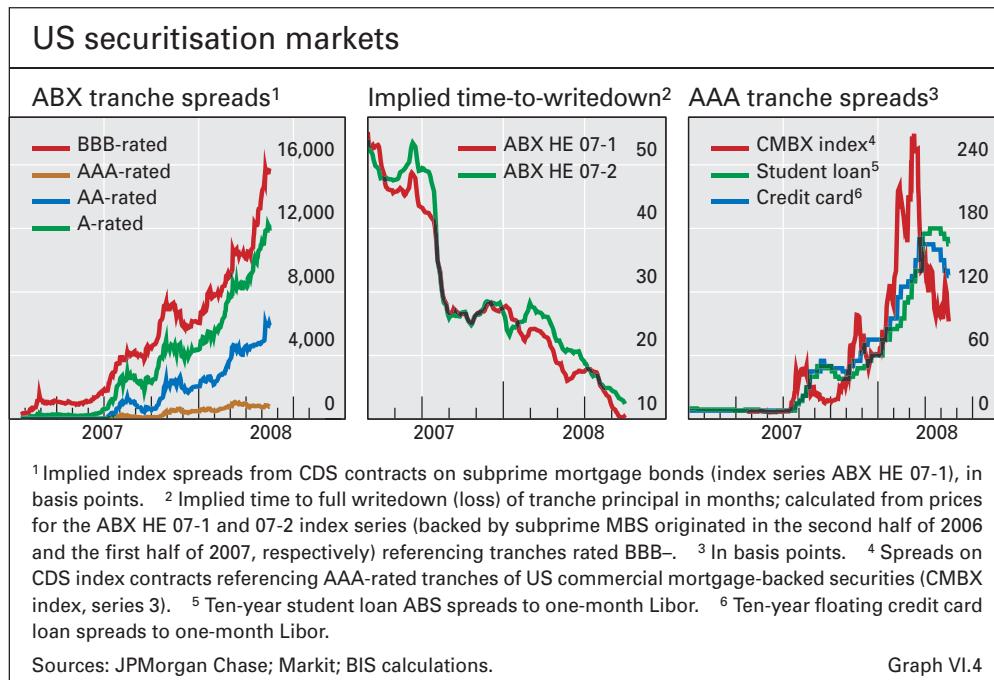
2008	
2–4 January	Weak purchasing managers' data and labour market reports point to a marked weakening in the US economy and trigger fears about global growth.
14–31 January	The ECB, Federal Reserve and Swiss National Bank carry out additional long-term funding operations in US dollars.
15 January	Citigroup announces a fourth quarter loss, partly due to \$18 billion of additional writedowns on mortgage-related exposures, starting another string of similar news from other financial institutions.
18–31 January	Fitch downgrades Ambac, a monoline insurer, by two notches from AAA and later also downgrades monolines SCA and FGIC to A and AA respectively. Some 290,000 insured issues, mostly municipal bonds, are downgraded as a result. Later, S&P downgrades FGIC to AA, and further rating actions by all three major rating agencies are taken on the monolines in the following weeks.
21–30 January	The Federal Reserve delivers a 75 basis point inter-meeting rate cut, following broad-based global equity and credit market weakness. The policy rate is lowered by another 50 basis points in the following week.
28 February– 7 March	Peloton Partners announces the closure of a \$2 billion ABS fund and temporarily halts redemptions from another fund, following margin calls by lenders. Thornburg Mortgage admits delays in meeting margin calls on repo borrowings and eventually defaults on such payments. Carlyle Group's mortgage bond fund also fails to meet margin calls, leading to a suspension of trading as investors force the sale of some of the fund's holdings. Pressures spread to European government bond markets, with pronounced liquidity tiering across issuers and market segments.
7–16 March	The Federal Reserve announces an increase of \$40 billion in the size of its new Term Auction Facility and, a few days later, expands its securities lending activities through a \$200 billion Term Securities Lending Facility that lends Treasury securities against a range of eligible assets. Later the same week, it announces a new Primary Dealer Credit Facility that extends discount window-type borrowing to the primary dealer community. Additional initiatives are announced by other central banks, including renewed auctions of US dollar funds.
14–17 March	Failure to roll over repo funds causes an acute liquidity shortage at Bear Stearns, emergency discount window borrowing and a subsequent takeover by JPMorgan.
2 May	The ECB, Federal Reserve and Swiss National Bank announce a further expansion of their US dollar liquidity measures.

Sources: Bloomberg; *Financial Times*; *The Wall Street Journal*; company press releases.

Table VI.1

2006. However, this early sell-off of instruments exposed to mortgage credit was partly reversed during subsequent months. By contrast, in June, with evidence of a severe erosion in mortgage quality accumulating since 2006, large-scale rating actions on subprime residential mortgage-backed securities (RMBS) coincided with news about the imminent shutdown of two hedge funds with large subprime exposures (Table VI.1). As the two funds were forced to delever, concerns about distressed asset sales caused credit spreads for subprime mortgage products to widen beyond their previous peaks (Graph VI.4, left-hand panel).

The initial sell-off was confined to subprime credits ...



### *Stage two: spillovers into other credit markets (mid- to end-July 2007)*

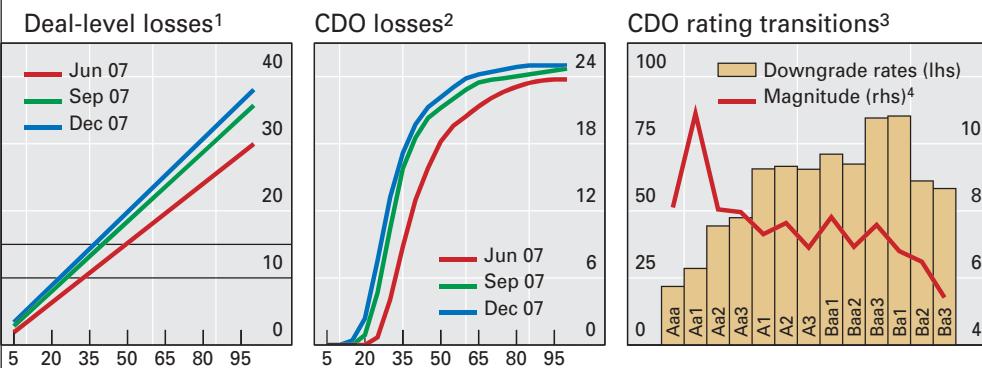
... but quickly spread across markets ...

While valuation losses on higher-rated exposures and instruments other than residential mortgage products were initially quite limited, the sell-off spread quickly during the second stage of the turmoil (Graph VI.4, left- and right-hand panels). Increasingly, lenders felt inadequately protected in an environment of rising volatility, leading to larger haircuts on RMBS, margin calls and more broad-based deleveraging. Amid concerns about forced sales of better-quality assets, mark to market losses mounted. As a result, the turmoil deepened from mid-July and into August, affecting such sectors as leveraged loans and commercial mortgages. As demand for loans and similar assets from collateralised debt obligations (CDOs) dried up, numerous leveraged buyout (LBO) deals had to be delayed or pulled from the market. Commercial mortgage-backed securities faced similar strains, as evidenced by indicators such as the CMBX index, possibly reflecting concerns about the extent to which weakening underwriting standards in the residential sector might have spread to the commercial mortgage business (Graph VI.4, right-hand panel).

... reflecting uncertainties about the size and distribution of losses ...

Uncertainties about the size and distribution of mortgage-related losses, as well as the lags until their realisation, were among the key drivers of market developments. With these uncertainties also came increased doubts about the reliability of ratings for structured finance products and the impact of the deterioration in mortgage quality on rating transitions. As mortgage delinquencies accumulated, so did projected losses, implying loss rates on recent-vintage subprime mortgage pools of 20% or higher, even under fairly optimistic assumptions (Graph VI.5, left-hand panel). On this basis, investors grew increasingly concerned about losses spreading along the securitisation chain, for example on instruments such as CDOs that themselves resecuritise mezzanine tranches of subprime mortgage deals. Projected losses on such

## Subprime markets: loss projections and rating transitions



<sup>1</sup> Average projected lifetime loss (vertical axis; as a percentage of original balance) on the constituent subprime mortgage securitisations underlying the ABX HE 07-1 index for different losses-given-default (horizontal axis; as a percentage of original balance) and a delinquency-to-default transition assumption of 65%; calculated from delinquency data using the methodology described in the Overview chapter of the December 2007 *BIS Quarterly Review*. Horizontal lines mark the 10% and 15% loss levels. <sup>2</sup> Average projected loss (vertical axis; as a percentage of original balance) on hypothetical CDOs backed by mezzanine (10–15%) tranches of the ABX HE 07-1 index for different losses-given-default (horizontal axis) and an assumed ABX HE allocation of 25% of the CDO pool; the remainder of the pool is assumed unimpaired. <sup>3</sup> End-2007 downgrade rates (number of downgraded tranches as a percentage of rated tranches) for Moody's-rated 2006 and 2007 vintage US structured finance CDO tranches, by original rating. <sup>4</sup> Average downgrade magnitude in notches.

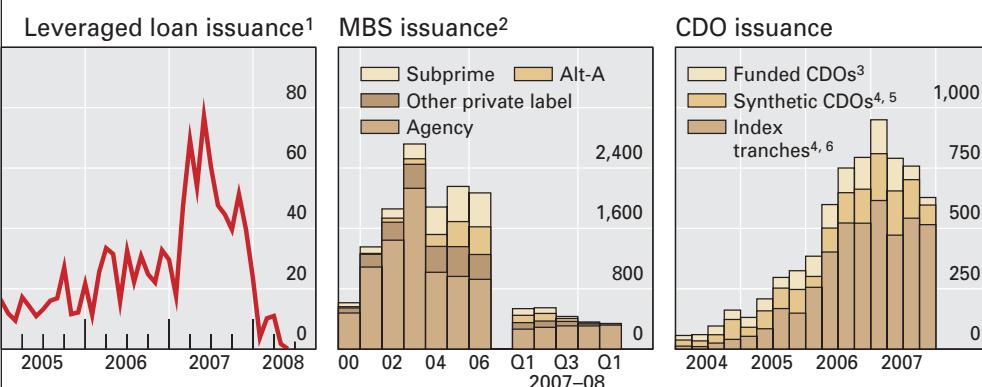
Sources: JPMorgan Chase; Moody's; UBS; BIS calculations.

Graph VI.5

CDOs are quite sensitive to adverse changes in credit quality within the underlying mortgage pools as well as in assumed loss severities, both of which made it progressively likelier that the tranches included in the CDO pool might be wiped out completely. Mortgage market deterioration and revised rating agency assumptions thus translated into unprecedented rating transitions, in terms of both scale and magnitude, for instruments backed by subprime collateral (Graph VI.5, centre and right-hand panels).

## Issuance volumes

In billions of US dollars



<sup>1</sup> Leveraged buyouts; global volumes. <sup>2</sup> US residential mortgage-backed securities. <sup>3</sup> Cash flow CDOs.

<sup>4</sup> Notional amount, not adjusted for the riskiness of different tranches. <sup>5</sup> Portfolio CDS referenced to corporations, sovereigns and ABS. <sup>6</sup> Portfolio CDS referenced to CDS indices.

Sources: Dealogic; LoanPerformance; SIFMA; UBS.

Graph VI.6

... and unprecedented numbers of rating downgrades

Against this background, large parts of the investor community essentially withdrew from structured assets altogether. Investors, particularly those that had historically relied chiefly on ratings in their risk management and investment decisions, started to question that reliance in the face of the unexpected and growing wave of downgrades. Loss of confidence in structured finance ratings, in turn, meant that demand for tranches credit products collapsed from the high levels observed in recent years, aggravating the decline in issuance volumes that had started early in the credit crisis (Graph VI.6). Activity in single- and multi-name CDS, in contrast, held up throughout the turmoil, with notional amounts growing by more than 35% during the second half of 2007.

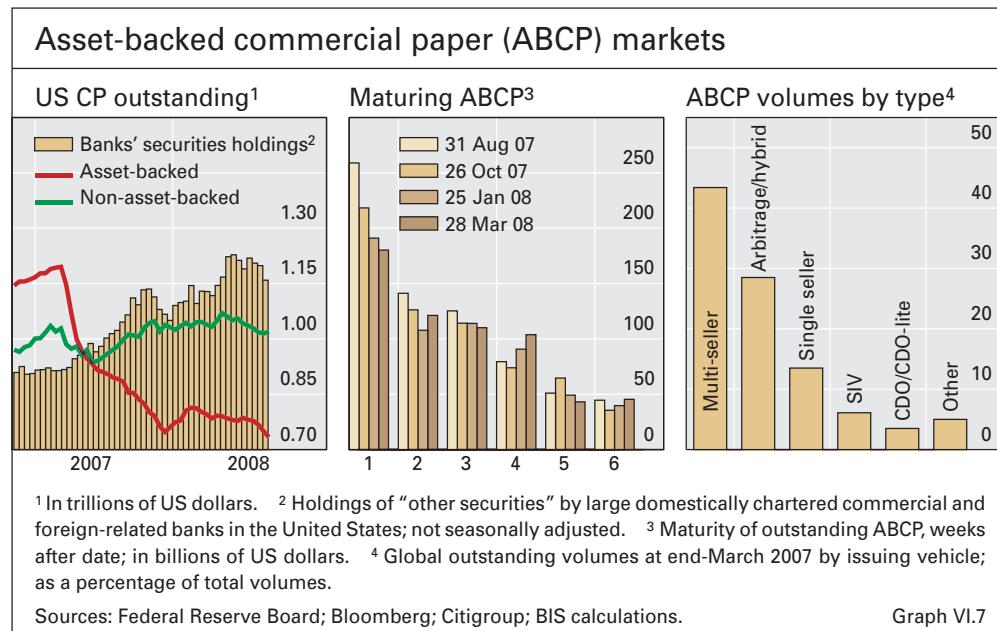
#### *Stage three: squeezed liquidity and involuntary reintermediation (August 2007)*

A full-blown crisis erupted in August ...

The third stage saw the credit market turmoil expand into short-term credit and interbank money markets. The initial mortgage market correction had been accommodated by the dealer community, which absorbed the affected assets in the face of shrinking demand. As originators continued to feed new loans into the securitisation pipeline, dealers withdrew, forcing the originators to draw down bank lines for financing. Investors, in turn, began to focus more closely on credit quality and valuation challenges in illiquid markets, and a number of asset managers halted redemptions on investment funds.

... following investor withdrawal from ABCP ...

As the crisis turned increasingly into one of asset valuation, investors pulled out of the market and caused an unprecedented wave of involuntary reintermediation. The first signs of the impending liquidity squeeze came in the asset-backed commercial paper (ABCP) market, when issuers began to encounter difficulties rolling over outstanding volumes. Pressures were particularly intense for structures with less than complete liquidity support from their sponsoring financial institutions, such as ABCP financing the asset pools of structured investment vehicles (SIVs), or paper backed by assets linked to



individual originators (Graph VI.7, right-hand panel). Volumes collapsed and the maturity profile of outstanding paper deteriorated, with markets stabilising only in early 2008. While some of the most troubled conduits were liquidated, many migrated back onto the balance sheets of their sponsors, adding to banks' securities holdings (Graph VI.7, left-hand and centre panels). As a result, when nervousness about funding needs and banks' conditional liabilities intensified, liquidity demand surged, causing an outsize and protracted disruption in interbank money markets that signalled the advent of a broader financial market crisis.

... and surging demand for liquidity in interbank markets

#### *Stage four: broad-based financial sector strains (September–November 2007)*

Credit markets recovered temporarily in September, but experienced a new bout of large-scale spread widening in October and November. The respite was afforded in part by repeated central bank liquidity injections aimed at easing the squeeze in money markets. Late September, in particular, saw a broad upturn in credit markets, with the US Federal Open Market Committee's decision to cut the federal funds target by 50 basis points on 18 September triggering a strong price reaction across all market segments. Adding to the positive sentiment, sizeable write-offs announced by major commercial and investment banks were seen as providing much needed transparency about mortgage-related losses. Recovering demand for such exposures, in turn, allowed banks to place some of their accumulated leveraged loan and bond deals that were awaiting financing (Graph VI.6, left-hand panel; see Chapter VII for more detail). However, sentiment worsened again from mid-October, following another wave of downgrades of RMBS and CDO ratings and negative financial sector news.

After a short respite ...

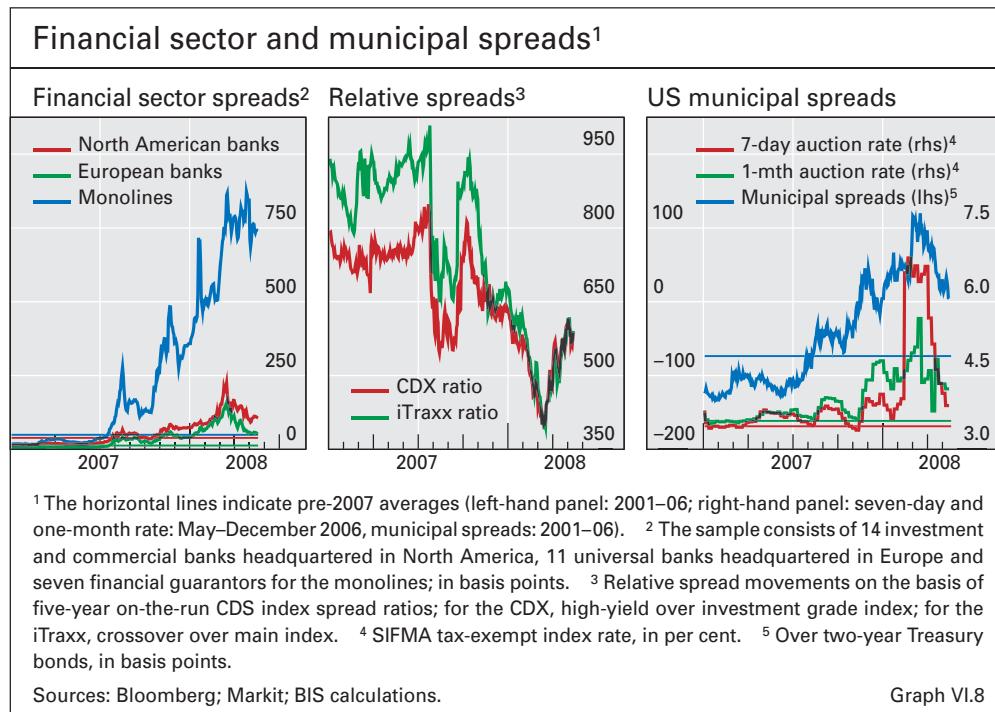
During this fourth stage of the turmoil, credit-related losses in the financial sector turned out to be larger than expected, adding to uncertainties about asset valuations and fears of broader economic weakness (see Chapter VII). Large upward revisions of earlier writedown announcements, in particular, triggered investor doubts about banks' ability to appropriately value and manage their exposures. Combined with renewed credit market weakness, this suggested that even more losses could be about to materialise. One sign of concern about related financial sector strains was the pricing of credit protection against the default risk of banks and other financial institutions, with spreads rising above the peaks they had reached during the summer (Graph VI.8, left-hand panel).

... sentiment worsened once again ...

Continued uncertainty about valuations was prompted in part by fears about asset sales by structured vehicles and further mortgage market deterioration. One factor was ratings-based and market value-related structural provisions in CDOs and SIVs that seemed likely to force liquidations of underlying collateral pools once deal-specific threshold levels were crossed. Another factor was that losses on subprime exposures were increasingly expected to eventually push through existing subordination layers (Graph VI.5, left-hand panel), leading the more senior tranches of recent mortgage securitisations to underperform lower-rated ones. Prices on the latter tranches, in turn, started to reflect expectations of full writedown of tranche principal

... following repeated writedowns by major banks ...

... concerns about ongoing deleveraging ...



by early 2010. While a further deterioration in mortgage fundamentals subsequently accelerated these implied times-to-writedown, loss accumulation was still expected to continue well into 2009 (Graph VI.4, centre panel).

In the process of these price adjustments, mortgage-related losses also started to emerge outside the banking sector, particularly among monoline financial guarantors, entities that specialise in writing insurance on a variety of highly rated bonds and structured products. Widening credit spreads on senior tranches of structured instruments had translated into mark to market losses on the value of insurance the monolines had written on mortgage-backed products. Anticipated increases in future claims thus caused CDS spreads of the monolines to widen sharply in the fourth quarter and into the new year, foreshadowing a string of negative rating actions on key monolines (Graph VI.8, left-hand panel). Looming monoline downgrades, in turn, meant further pressures on bank balance sheets arising from expected valuation changes for credit insurance that had been provided on banks' retained exposures to senior CDO tranches, as well as from liquidity backstops for monoline-enhanced money market instruments. As a result, the widening of financial sector spreads was more pronounced than that of other market segments, contributing to an overall underperformance of investment grade benchmarks vis-à-vis lower-quality assets (Graph VI.8, centre panel).

#### *Stage five: growth fears and dysfunctional markets (January–mid-March 2008)*

... and looming  
monoline  
downgrades

Amid rising fears  
about growth ...

After a short lull in credit market conditions in December, disappointing macroeconomic indicators caused yet another widespread repricing of risk in early 2008. This fifth period of very negative credit market sentiment followed the release of data in early January indicating weak growth in the US manufacturing sector along with disappointing labour market developments.

Concerns about risks to growth were further fuelled by rising fears of a credit crunch (see Chapters II and VII). Related nervousness about feedback effects between macroeconomic and financial developments reached a climax on 21 and 22 January. Following the downgrade of a large monoline insurer the previous Friday, risky assets sold off across markets and countries, and markets remained volatile into February and March, despite extraordinary policy rate cuts by the Federal Reserve on 22 and 30 January.

By that point, investor withdrawal from various financial markets had intensified to such an extent that parts of the financial system became dysfunctional, causing further financial retrenchment. Reflecting these difficult conditions, spreads on even the most highly rated and otherwise liquid assets reached unusually wide levels in early 2008. This included markets, such as those for certain US student loan securitisations, whose underlying exposures are almost entirely protected by federal guarantees (Graph VI.4, right-hand panel). While, at these elevated spread levels, primary issuance continued, arranging banks were finding it difficult to place anything but the most senior tranches. With the remainder of the issued structures being retained, this added to existing constraints on bank capital.

In late February and early March, with balance sheet pressures continuing to intensify, banks sought to further cut their exposures across various business lines, contributing to another fall in investor risk appetite. One such move was the withdrawal of banks' implicit liquidity support for an estimated \$330 billion worth of auction rate securities, which provide long-term financing to municipal and other borrowers in the United States at variable short-term interest rates tied to an auction process. Failed auctions and the resulting rate resets thus raised the cost of financing for these borrowers (Graph VI.8, right-hand panel). Pressures were also evident elsewhere, such as in the markets for highly rated US agency and private label mortgage-backed securities, which experienced a rapid increase in price uncertainty. The deterioration in confidence regarding asset values culminated in early March, when the tightening of repo haircuts caused a number of hedge funds and other leveraged investors to unwind existing exposures, threatening a cascade of further margin calls and widening spreads.

Events came to a head in the week beginning 10 March. This started with the Federal Reserve's announcement of an expansion of its securities lending activities targeting the large US dealer banks, later supplemented by a temporary facility providing overnight loans against a broad range of collateral (see Chapter IV). While the initial announcement seemed to provide temporary relief, the US investment bank Bear Stearns suffered a severe liquidity shortage later in the week. This led to its takeover by JPMorgan the following Monday, a measure facilitated by the Federal Reserve.

#### *Stage six: the crest of the credit crisis to date (mid-March–May 2008)*

These developments appeared to herald a turning point, with markets moving into the sixth and, to date, final stage of the financial turmoil. Consistent with perceptions of a considerable reduction in systemic risk, spreads, particularly those for financial sector and other investment grade firms, retreated

... credit markets turned increasingly dysfunctional ...

... triggering further deleveraging ...

... and heightened asset price uncertainty

Repeated central bank action ...

... and the takeover of a major investment bank ...

... seemed to mark a turning point in market sentiment

substantially following the takeover of Bear Stearns from the peaks reached during previous weeks. Amid signs of short covering, the tightening continued through April, with spreads rallying back to where they had been in mid-January, and seeming to stabilise around these levels from early May.

Even so, interbank money markets failed to recover. Given continued capital and funding constraints for some investors as well as the disappearance of demand from structures such as SIVs and CDOs, large overhangs of credit exposure continued to weigh on markets. By mid-May, with the credit cycle continuing to deteriorate and higher default rates looming, it remained unclear whether liquidity supply and risk appetite had recovered sufficiently to help maintain this improved credit market environment on a sustained basis.

### Money markets hit by liquidity squeeze

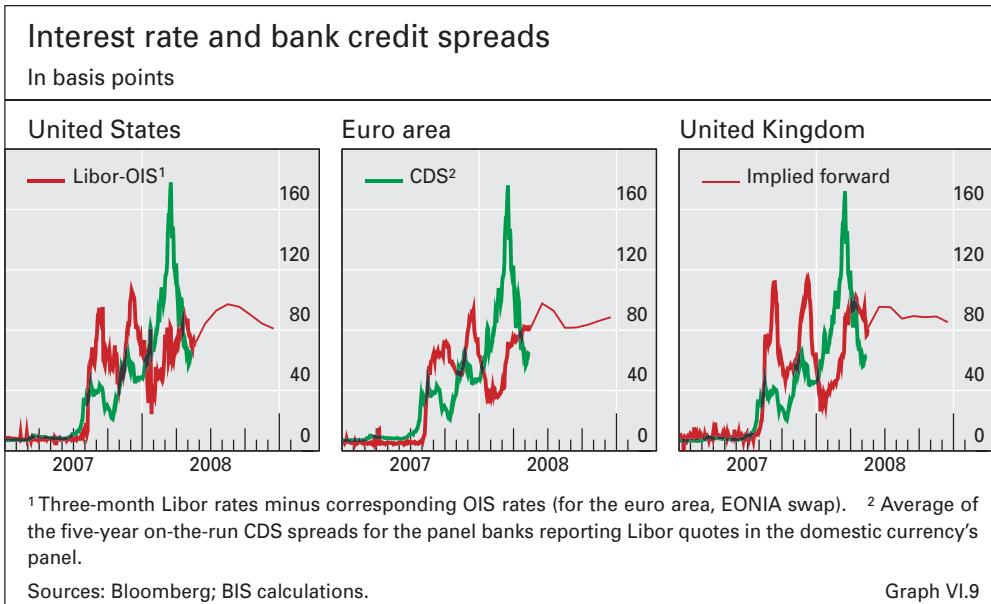
Severe disruptions  
in interbank  
markets ...

One of the key distinguishing features of the financial turmoil was the onset of unprecedented dislocations in interbank markets, and in money markets more broadly, resulting from a surge in liquidity demand and a loss of confidence in the creditworthiness of counterparties. The initial trigger for these severe tensions was serious liquidity disruptions in the \$1.2 trillion ABCP market during the third stage of the unfolding financial turmoil, as described above. These disruptions quickly led to deep concern about the adverse effects of potentially large-scale reintermediation linked to banks providing backup credit lines for vehicles active in the ABCP market and, subsequently, in other markets. Worries about the liquidity and capital implications for banks engendered growing distrust towards counterparties, while uncertainty about the stability of the banking system as a whole grew, as indicated by widening swap spreads (see below). In this environment, banks became less willing to lend money to other banks, while, at the same time, concerns about their own liquidity requirements led to rapidly increasing demand for borrowed funds. Adding to this, money market mutual funds, which traditionally have been providers of funding for banks, shifted a large portion of their investments away from banks and into safe government debt, as their appetite for risk fell sharply (see below).

Central bank liquidity injections alleviated some of the pressures in interbank markets (see Chapter IV), but uncertainty about future liquidity needs and counterparty risk persisted. As a result, interest rates in the interbank market remained elevated and volatile relative to comparable rates throughout much of the period under review. Moreover, with most central banks initially focusing on alleviating strains in the very shortest maturity segment, tensions further out in the maturity spectrum soon became particularly pronounced, inducing central banks to shift their attention increasingly to liquidity shortages at longer maturities.

... led to sharply  
higher interbank  
rates ...

Such liquidity strains were evident from the unprecedented, persistent widening of spreads between interbank rates for term lending and overnight index swap (OIS) rates at corresponding maturities. For example, prior to the outbreak of the financial turmoil, three-month Libor rates had exceeded OIS rates by only a few basis points on average, but from late July 2007 the difference surged to levels sometimes exceeding 100 basis points (Graph VI.9).



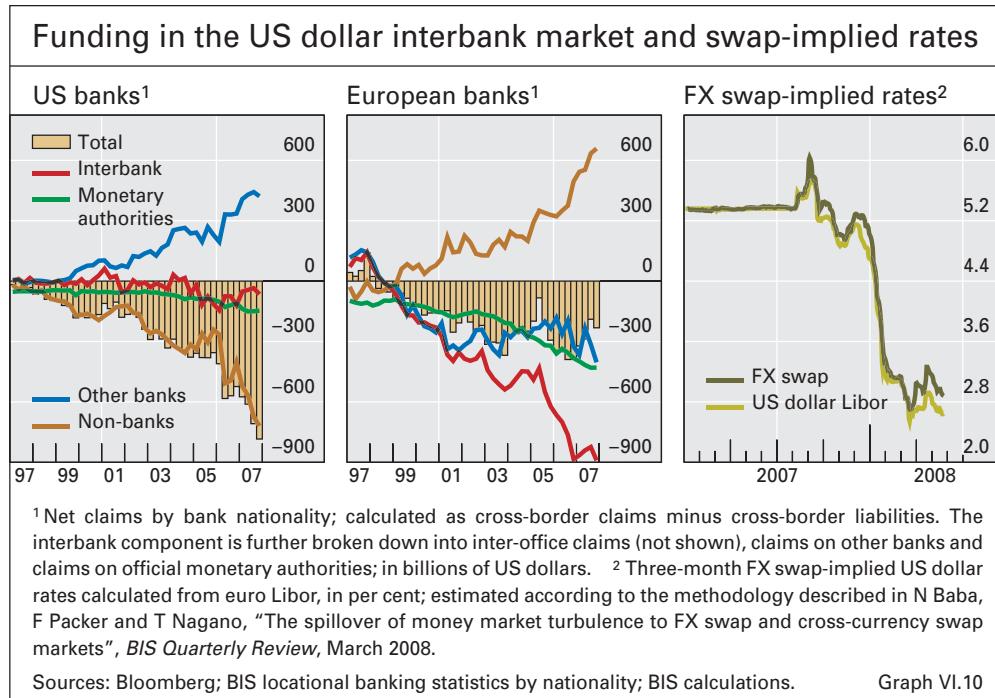
Interbank and OIS rates both reflect investors' expectations about future interest rates, but because interbank lending involves payment of the entire principal up front whereas OIS contracts are settled on a net basis at maturity, they differ substantially with respect to their liquidity and credit risk implications. The sharp widening in Libor-OIS spreads therefore clearly signalled some combination of greater preference for liquidity and rising counterparty risk premia. Moreover, implied forward spreads at the end of the period under review suggested that investors expected this to be a persistent phenomenon (Graph VI.9).

The relative contributions of liquidity and credit risk to the rise in interbank rates have proved very hard to disentangle, not least because the two components are highly interrelated. The behaviour of Libor banks' CDS spreads vis-à-vis Libor-OIS spreads suggests that, while credit concerns have indeed played a role in driving interbank rates during the turmoil, liquidity factors have accounted for much of the dynamics (Graph VI.9). In addition, the cyclical pattern in Libor-OIS spreads to some extent also indicated seasonal liquidity shortages related to end-quarter and end-year funding concerns, which were more severe than normal after the first half of 2007. Further complicating matters, worries about the reliability of the Libor fixing mechanism began to surface as the gridlock in interbank markets persisted, in particular for US dollar loans. Specifically, market participants voiced suspicions that some banks in the Libor panel may have been reporting rates lower than their actual borrowing costs in order to appear stronger from a liquidity/credit risk perspective. Following reports in April that the British Bankers' Association was investigating this issue, US dollar Libor rates suddenly jumped to levels that seemed more in line with actual borrowing rates.

One characteristic of the strains in interbank markets during the financial turbulence seems to have been difficulties for European banks, in particular, in obtaining US dollar funding, as the demand for dollar liquidity surged. BIS data on banks' total cross-border positions by nationality suggest that

... due to  
counterparty risk  
concerns and  
surging liquidity  
demand

European banks  
were hit by dollar  
funding problems

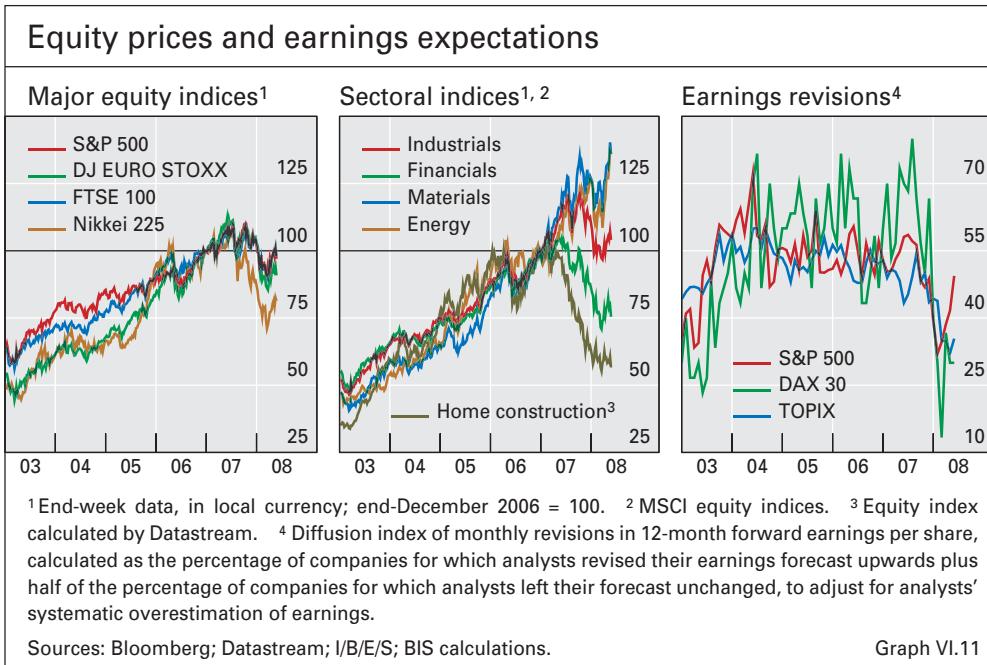


significant differences in the global funding patterns of European and US banks may have been behind these difficulties. Over the past few years, US banks have increasingly borrowed US dollars from non-banks, and have channelled these funds to unaffiliated banks through the interbank market (Graph VI.10, left-hand panel). At the same time, European banks have increasingly transformed interbank funds, and those from official monetary authorities, into US dollar-denominated claims on non-banks (Graph VI.10, centre panel). Overall, by the fourth quarter of 2007, US banks' total net dollar claims on other banks had reached \$421 billion, while European banks' net dollar liabilities to banks stood at almost \$900 billion. Frequent rollovers by European banks of short-term dollar borrowing in the interbank market, in order to finance longer-term investments in non-banks, had been practised without problems for many years. However, as market tensions rose in the second half of 2007, with European banks sharing in the \$380 billion decline in outstanding ABCP volumes that had to be taken back on balance sheet, this need for constant refinancing contributed to the liquidity squeeze witnessed in the interbank market. Some foreign exchange swap and cross-currency swap markets displayed notable signs of strain consistent with this: US interest rates derived from foreign exchange swap prices at times deviated significantly from actual US dollar Libor during the turmoil (Graph VI.10, right-hand panel).

### Credit turmoil spilled over to equity markets

Equity prices began to fall over the summer ...

Equity prices in the advanced industrial economies began to fall over the summer of 2007, following the widening of CDS spreads during the onset of the credit market turmoil (Graph VI.11, left-hand panel). Stock prices dropped further in late 2007 and early 2008, as renewed credit-related concerns and the



worsening of the US macroeconomic outlook triggered worries about future profits and depressed investors' risk tolerance. From mid-March 2008, however, share prices recovered sharply across the board, following the takeover of Bear Stearns by JPMorgan. Between end-March 2007 and mid-May 2008, the S&P index was almost unchanged, while the Nikkei 225 and DJ EURO STOXX indices fell by 18% and 9%, respectively.

#### *Weakness concentrated in the financial sector and Japanese shares*

Equity market weakness was initially concentrated in the financial sector, with bank stocks being hit particularly hard. From end-March 2007 to mid-May 2008, global financial shares fell by almost 20%, the fastest pace of decline since the end of 1994, when the Morgan Stanley Capital International (MSCI) financial index became available. By contrast, performance of non-financials was mixed. While the slump in the US housing was reflected in the underperformance and steep decline in share prices in such sectors as housing construction, gains were recorded in the materials and energy sectors, due to the strong performance of commodity markets over the period (Graph VI.11, centre panel).

... with bank stocks hit particularly hard

Japanese equities overall showed the largest decline among advanced economy markets (Graph VI.11, left-hand panel). Despite the fact that Japanese financial institutions were reported to be less exposed to subprime loans than their US and European counterparts, Japanese financial shares recorded a large loss. The outsize decline was also due in part to concerns about the negative impact of the US economic slowdown on Japanese exporters, as well as the further appreciation of the yen. Periods of rapid yen appreciation against the dollar have often coincided with weak Japanese share prices in the past. In line with this, the main Japanese share index fell by more than 20% as the yen appreciated by a relatively large 14% against the dollar between end-2007 and mid-March 2008.

Japanese equities showed the largest decline

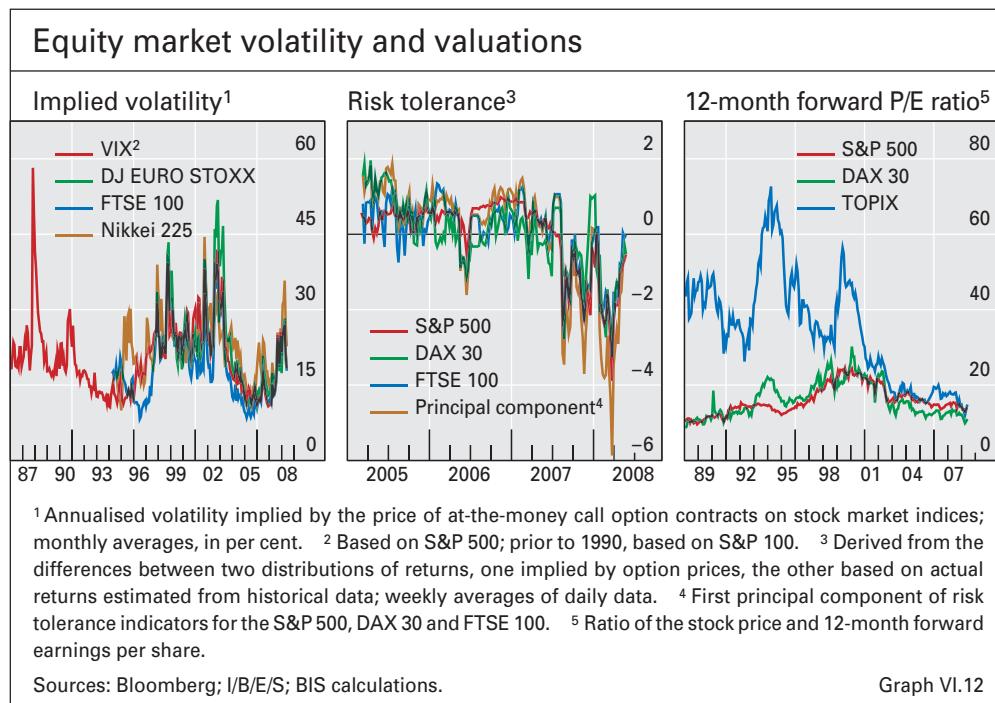
### Elevated US recession risk weighed on earnings expectations

Earnings expectations fell sharply on evidence of weaker economic activity

A key drag on share prices was the sharp reversal in expectations for earnings of listed firms in advanced economy markets. This largely reflected growing concerns that the US slowdown might be more severe and prolonged than previously thought. From mid-2007, diffusion indices of revisions in 12-month forward earnings per share in major markets plunged to levels not seen since 2002 (Graph VI.11, right-hand panel). These downbeat forecasts were subsequently validated by reported earnings. Cumulative earnings per share in the United States fell by more than 20% (year over year, share-weighted basis) in the fourth quarter of 2007, considerably more than the 3% decline in the previous quarter. In January 2008, accumulating evidence of weaker real economic activity prompted further downward revisions to expected earnings. From March 2008, however, earnings expectations started to recover in the United States and key European countries.

Volatility increased and risk tolerance declined

At the same time, heightened uncertainties about the outlook resulted in much higher volatility and declining risk tolerance. Option-implied market volatility in the United States, on an uptrend since early 2007, reached 30% in August 2007 and early 2008, close to levels last seen in April 2003. This is more than twice the 2004–06 average of 14%, and substantially higher than the historical (1986–2006) average of around 20% (Graph VI.12, left-hand panel). Volatilities in other equity markets followed a similar pattern, with the surge being particularly pronounced in Japan, where volatility approached the peak seen in 2001. Indicators of investors' tolerance for risk in equity markets, measured by differences between the statistical distribution of actual equity returns and the distribution implied by option prices, also deteriorated markedly up to March 2008, reaching the lowest levels since 2005 (Graph VI.12, centre panel). Following the news of the takeover of Bear Stearns in mid-March,



however, equity prices in advanced industrial economies rebounded, in line with a decline in volatilities and recovering risk appetite.

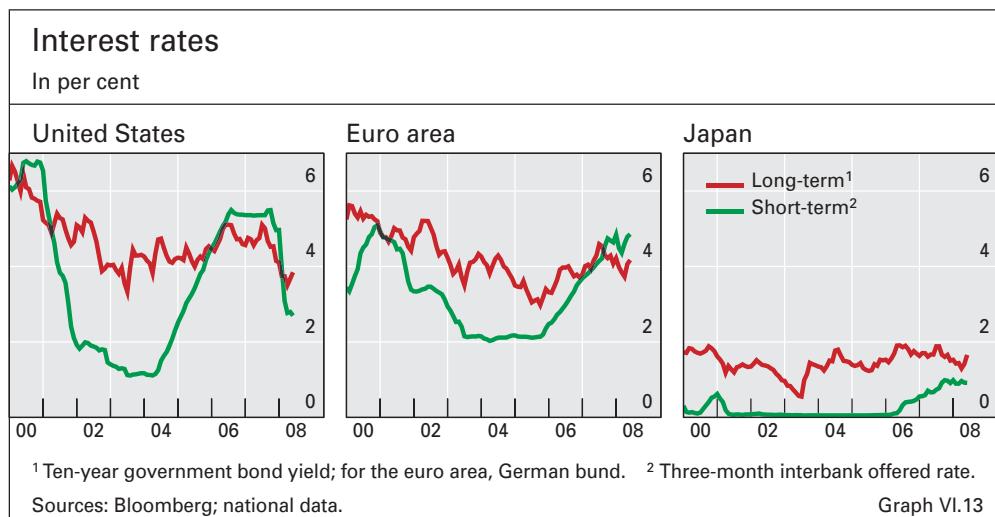
Declining risk appetite up to March 2008 was also evidenced by lower valuations, based on price/earnings ratios. Forward-looking valuation measures fell over the period, as downward revisions in earnings did not keep pace with the sharper decline in equity prices, despite analysts' increasing pessimism. For example, the S&P 500 fell from around 14 times one-year-ahead forecast earnings in 2006 to 13 in March 2008, its lowest level since 1995. The level in March 2008 was well below the average since 1988, but in line with averages during 1988–97, which excludes the valuation peaks of the late 1990s, a period marked by extreme optimism among equity investors (Graph VI.12, right-hand panel). Valuation measures based on the DAX and TOPIX declined as well; by March 2008 they stood well below long-term averages.

Forward-looking valuation measures fell

### Bond yields fell sharply as the financial turmoil deepened

After seeing mostly rising long-term yields in the first half of 2007, developed country government bond markets experienced rapidly falling yields as the turmoil broke out. This strong downward pressure on yields was the result of a combination of flight to safety and expectations of lower interest rates as the outlook for economic growth deteriorated. The impact of both factors was especially evident in the United States, where the economy appeared particularly fragile. Between the local pre-turmoil peak in mid-June 2007 – which was still low by historical standards – and the Bear Stearns collapse around mid-March 2008, 10-year US government bond yields fell by almost 200 basis points to around 3.35%, a level not seen since 2003 (Graph VI.13, left-hand panel). Yields also dropped in the euro area and Japan, although to a lesser extent, reflecting perceptions that downside risks for these economies were less acute than for the United States: 10-year euro area bond yields fell nearly 100 basis points to below 3.70%, while corresponding Japanese yields declined by some 70 basis points to just below 1.30% (Graph VI.13, centre and right-hand panels). As the situation in global financial markets seemed to

Bond yields tumbled ...



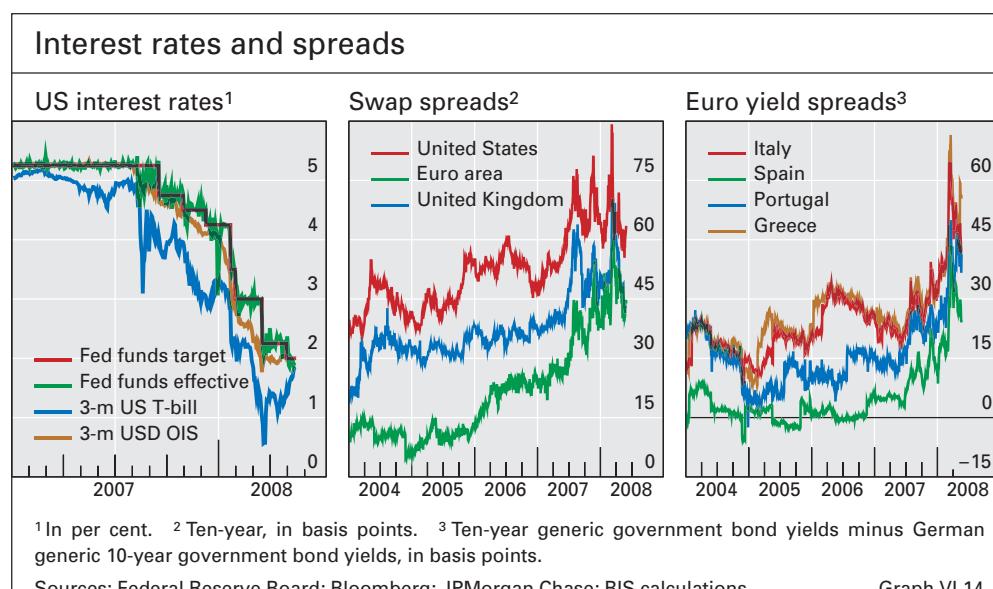
stabilise and improve to some extent from around mid-March 2008, bond yields recovered somewhat: between mid-March and mid-May, 10-year US and euro area yields rose by around 50 basis points, while in Japan they increased by more than 40 basis points.

#### *Flight to safety led to scramble for government securities*

... as investors sought safe havens ...

When credit markets first started to sell off in summer 2007, investors quickly began scaling back their holdings of risky assets, leading to much higher demand for relatively safe government securities. Apart from tumbling yields, the result was a shortage of available government bills and bonds for repo transactions, particularly towards the end of 2007 and in early 2008. This shortage manifested itself in a sharp increase in the number of Treasury "fails" in the United States, ie situations in which a trade involving Treasury securities fails to settle on schedule (including both fails to receive and fails to deliver). Whereas such fails had averaged around \$90 billion per week in the first three quarters of 2007, they more than doubled in the fourth quarter to over \$200 billion per week, and surged further to a weekly average in excess of \$700 billion in the first one and a half quarters of 2008.

The flight to safety, in combination with the rush for liquidity, resulted in a significant rise in inflows into money market funds. In the United States, for example, while total net assets in money market funds had fluctuated between \$1.8 trillion and \$2.4 trillion during 2000–06, they soared to more than \$3.1 trillion by end-2007 and increased further to over \$3.5 trillion three months later, before stabilising. With a large part of these inflows being invested in short-dated government securities, this added to the severe downward pressure on such securities, in particular US Treasury bills (Graph VI.14, left-hand panel). On occasion, the three-month T-bill traded more than 180 basis points below the corresponding expected average federal funds rate, as reflected by the three-month OIS rate. At the same time, a number of mutual funds that had invested in short-term securities related to subprime mortgages



were hit by the turmoil. Indeed, in some cases these funds required parent institutions to inject capital in order to prevent their net asset value from falling below par.

As the market turmoil unfolded, swap spreads widened substantially, with 10-year US, euro area and UK spreads reaching levels not seen since 2001 (Graph VI.14, centre panel). This seemed to reflect in part heightened concerns among investors about systemic risks, as fears of instability in the banking system accumulated. In addition, the rise in swap rates vis-à-vis government bond yields reflected investors' flight from risky assets into government securities, as well as increased use of swaps in an effort to hedge credit-related exposures in an environment where liquidity in traditional hedging markets was becoming increasingly scarce.

In yet another sign of heightened liquidity preference and lower appetite for risk, spreads between German and other individual euro area government bond yields widened to unusually high levels after mid-2007 (Graph VI.14, right-hand panel). The spread between Spanish and German 10-year bond yields, for example, rose from around 5 basis points in June 2007 to over 40 basis points in March 2008, and corresponding Italian spreads increased from about 20 to 60 basis points, before recovering somewhat by mid-May. Although some commentators attributed this widening of spreads in part to concerns about growing stresses within the monetary union linked to differences in fundamentals, it appeared more likely that the lion's share was due to investors' extreme unwillingness to hold anything but the most liquid securities available.

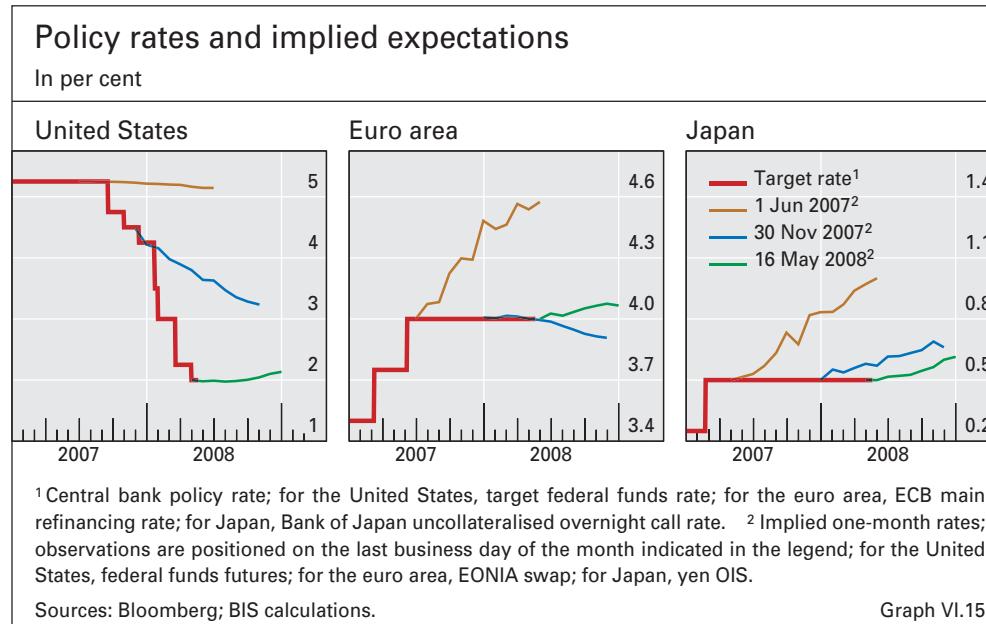
... amid falling appetite for risk ...

#### *Recession fears drove yields further down*

Perceptions of a weakening economic outlook gradually reinforced the downward pressure on yields exerted by the flight to safety. In line with this, around three quarters of the decline in long-term yields seen in the US and euro area markets for nominal bonds since mid-2007 was attributable to falling long-term real yields. Short- to medium-term real yields declined even more sharply: for example, estimated US three-year real zero coupon yields plunged by almost 300 basis points between end-May 2007 and mid-March 2008, to trade at negative yield levels (Graph VI.16, left-hand panel). This largely reflected expectations that short-term nominal interest rates would on average be lower than inflation in the United States for a number of years to come, implying a protracted period of low policy rates, presumably as a result of weak growth, coupled with lingering inflation. Short-term real yields also fell in the euro area, but substantially less than in the United States: between end-May 2007 and mid-March 2008, three-year real euro area yields fell by 130 basis points to around 0.90%. As tensions in financial markets appeared to ease to some extent, real yields also recovered somewhat between mid-March and mid-May.

... and expectations of weakening economic growth

Despite persistent inflation pressures, market expectations of policy rate cuts intensified as the growth outlook deteriorated, in particular in the United States. While prices of federal funds futures contracts in early summer 2007 had indicated expectations of a broadly stable monetary stance for some time – consistent with Federal Reserve signalling at the time – this picture changed



The Federal Reserve cut rates significantly ...

... and investors expected less tight monetary policy elsewhere

rapidly as conditions in financial markets worsened (Graph VI.15, left-hand panel). By the fourth stage of the turmoil, in November 2007, the target federal funds rate had already been cut by 75 basis points, yet markets expected still more easing in the months ahead. With the situation deteriorating further at the beginning of 2008, the total additional 200 basis point target rate reduction announced by the Federal Reserve in the first quarter was even larger than had been anticipated by investors in late 2007. This, together with new measures announced by the Federal Reserve to provide liquidity to market participants, and the rescue of Bear Stearns in March, seemed to help rebuild some confidence among investors. By mid-May, following a further 25 basis point easing on 30 April, prices of federal funds futures contracts indicated expectations of a period of interest rates on hold.

In the euro area and Japan, expected policy rates also shifted downwards as the turmoil unfolded, although, compared to US rates, investors' revisions were much more measured, as were subsequent actual policy moves. Prior to the crisis, markets had seen rates continuing to rise gradually in both the euro area and Japan (Graph VI.15, centre and right-hand panels). Perceptions that these economies were less vulnerable than the United States, in combination with central bank signalling, led market participants in the second half of 2007 to only gradually reassess their expectations for policy rates in both economies.

#### *Break-even inflation rates rose despite a softening economic outlook*

While the outlook for economic activity weakened as the financial turmoil unfolded, this seemed to have little dampening effect on inflation expectations, as measured by surveys of analysts' inflation forecasts. Part of the reason was doubtless an accelerating rise in oil prices as well as a sharp pickup in food prices, which pushed up headline inflation figures. This probably also contributed to stable and, at times, rising spot break-even inflation rates in the United States and in the euro area.

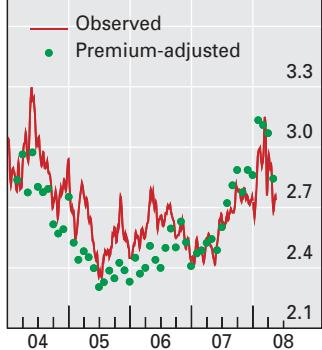
## Real bond yields and forward break-even inflation rates

In per cent

### Real bond yields<sup>1</sup>



### US forward break-evens<sup>2</sup>



### Euro forward break-evens<sup>2</sup>



<sup>1</sup>Estimated real zero coupon bond yields, based on prices of index-linked bonds; five-day moving averages. <sup>2</sup>Five-year forward break-even inflation rates five years ahead, calculated from estimated zero coupon spot break-even rates; "observed" refers to unadjusted forward break-even rates (five-day moving averages of daily values) while "premium-adjusted" refers to forward break-even rates that have been adjusted for corresponding estimated forward inflation risk premia (available at a monthly frequency). Premia are estimated using a modified version of the essentially affine macro-finance term structure model in P Hördahl and O Tristani, "Inflation risk premia in the term structure of interest rates", *BIS Working Papers*, no 228, May 2007. Estimations are based on nominal and real yields of various maturities, as well as data on inflation, the output gap and survey expectations of interest rates and inflation.

Sources: Federal Reserve Board; Bloomberg; BIS calculations.

Graph VI.16

Rising forward  
break-even rates ...

More significantly, five-year forward break-even rates five years ahead, a common measure of inflation compensation that is less likely to be influenced by increasing oil prices and other transient shocks, rose in the United States and the euro area in the second half of 2007 and early 2008 (Graph VI.16, centre and right-hand panels). The increase was particularly pronounced for US forward break-even rates, and coincided with the Federal Reserve's 300 basis point total cut in the target federal funds rate between September 2007 and March 2008. Investors may therefore have taken the view that the Federal Reserve, and perhaps other central banks, might have to maintain a more accommodative policy stance than normal in order to contain risks to economic growth in an environment of severely strained financial markets, ie a "risk management" approach to monetary policy (see Chapter IV). As the situation in markets improved after mid-March, and expectations of further sharp rate cuts receded, break-even rates fell back from their highs.

At the same time, break-even inflation rates must be interpreted with caution. They reflect not only inflation expectations, but also various risk premia – notably for inflation and illiquidity risk – and possibly also effects stemming from institutional factors. Moreover, during times of severe market stress, technical factors such as flight to safety and rapid unwinding of trades may affect break-even rates and complicate their interpretation. Abstracting from liquidity effects and influences due to institutional and technical factors, break-even inflation rates reflect two components: expected inflation over the horizon of the break-even rate, and a risk premium related to inflation uncertainty. One can therefore try to adjust observed break-even rates for estimates of such inflation risk premia in an effort to obtain a somewhat more

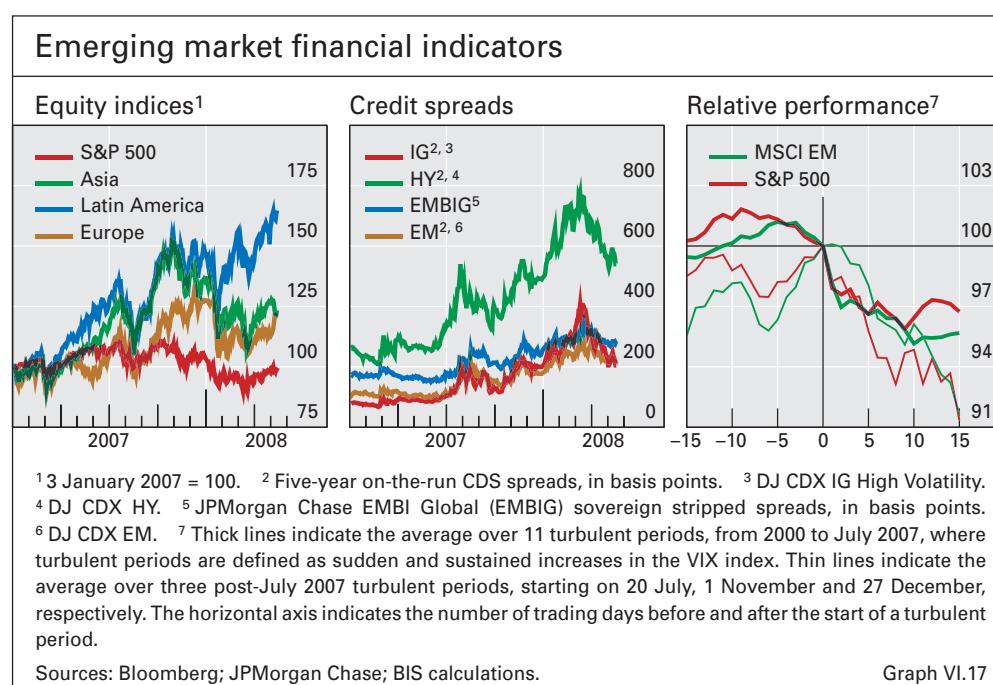
... seemed to signal higher expected US inflation

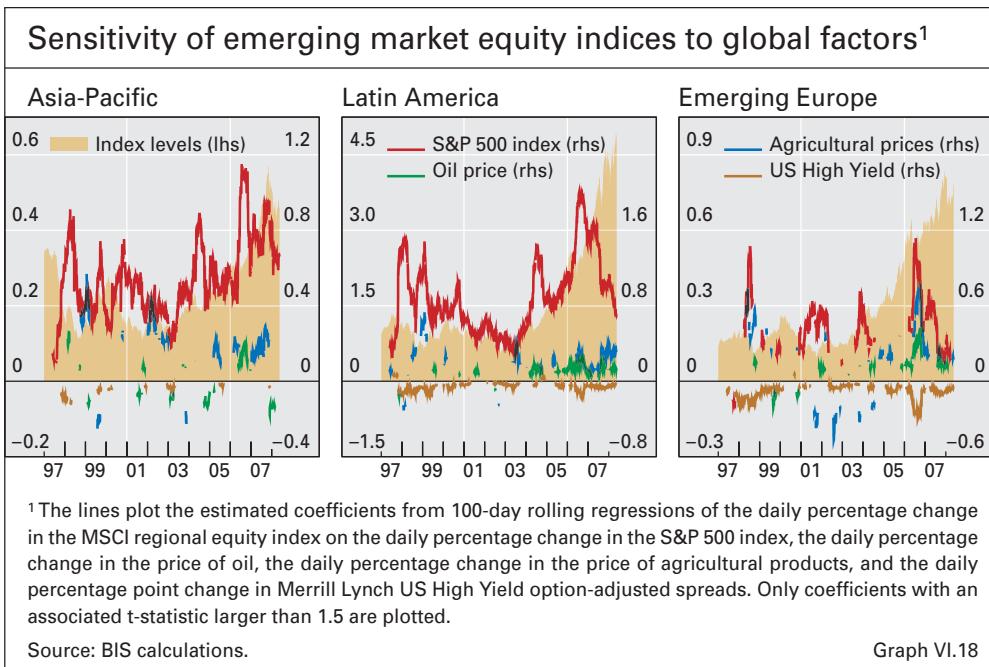
accurate picture of investors' inflation expectations. Estimates of inflation premia can be obtained, for example, by jointly modelling the dynamics of nominal and index-linked bond yields together with macro variables. According to estimates from such a model, the rise in the US forward break-even rate until around mid-March seemed to be largely due to rising long-horizon inflation expectations (Graph VI.16, centre panel). By contrast, while some of the short-term fluctuations in euro area forward break-even inflation rates also appeared to reflect changing inflation expectations, the model estimates suggest that much of the increase that took place in the second half of 2007 and early 2008 was attributable to rising inflation risk premia (Graph VI.16, right-hand panel).

### Emerging market assets showed signs of resilience

Emerging market asset values, which experienced significant growth in the first half of 2007, generally proved to be more resilient during the turmoil than those of comparable asset classes elsewhere and, indeed, than in previous episodes of market turbulence in advanced economies.

During the first half of 2007, emerging market asset prices soared, underpinned by yet another year of strong economic performance. Emerging economies continued to experience rapid growth, with surging commodity prices supporting further improvements in fiscal and balance of payments positions in many countries (see Chapter III). Despite a brief period of market turbulence in late February 2007, the JPMorgan EMBIG index of spreads on US dollar-denominated sovereign debt continued to drift lower up to mid-year, reaching an all-time low of 151 basis points in early June (Graph VI.17, centre panel). Emerging equity markets also saw strong gains, with the MSCI index up 16% by mid-year (Graph VI.17, left-hand panel).





In line with the general repricing of risk, emerging market asset values experienced considerable swings in the second half of the year, although not as large as those observed in some mature economies. Between end-June and 26 November 2007, spreads on emerging market sovereign debt widened by 107 basis points, much less than the widening in US high-yield credit markets over the same period. Moreover, while the cost of insuring emerging market sovereign debt against default, tracked by the CDX EM index, rose during the turmoil, spreads on CDS contracts of similar maturity on some US investment grade paper rose even more. By November 2007, the CDX EM had fallen well below the high-volatility subindex of the North American investment grade CDX index (Graph VI.17, centre panel).

Emerging equity markets were hit particularly hard during the initial stages of the turmoil, although they proved to be more resilient relative to markets in some mature economies during later stages. From their peak on 23 July, they gave back a large part of their gains from the first half of the year over the next month, with the broad MSCI emerging market index down 18% by 17 August, compared to a 10% decline in the global index over the same period. However, emerging market equities rebounded in September and October, boosted by particularly strong performance in Asia (24%) and Latin America (25%) during these months. By year-end, the broad indices for each of the three emerging regions were still above their 23 July levels, while the major indices for the United States, Japan and Europe had all registered declines of 4% or more.

As in advanced industrial economies, concerns over a more widespread slowdown in growth clearly began to weigh on many emerging markets in early 2008. The string of weak real side data for the United States released in January sparked a global equity market sell-off, leaving the broad emerging market index down more than 10% for the month. Spreads on emerging market sovereign debt also widened in the wake of the sell-off, with the EMBIG

Emerging market assets followed global markets lower in August ...

... and in early 2008

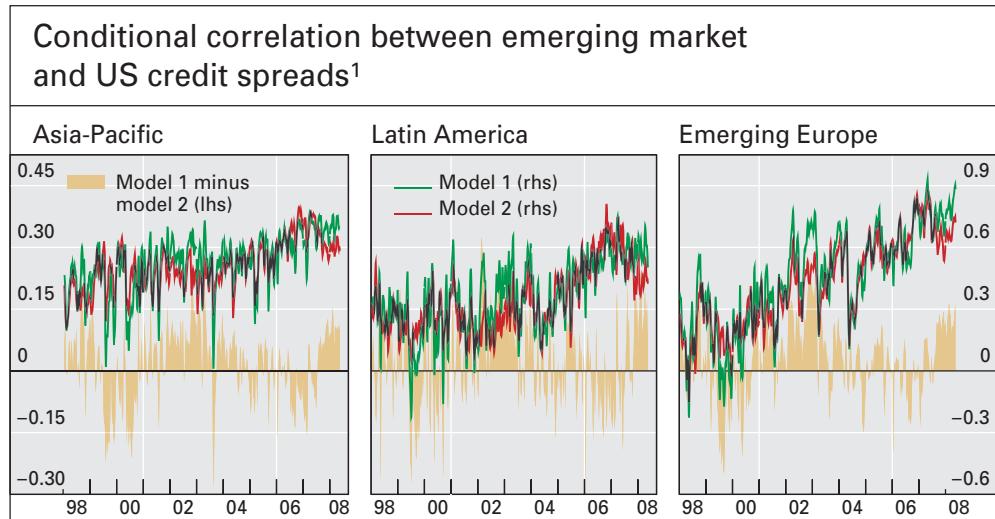
Surging commodities supported equity markets in some countries

Price sensitivity to US market moves has declined ...

ultimately reaching 339 basis points on 17 March, as news of the worsening financial distress of Bear Stearns reached the market.

The sharp declines in emerging equity markets in early 2008 differed significantly across countries. Rising commodity prices provided support for markets in Russia, Latin America and the Middle East but at the same time fuelled concerns about domestic inflation in all emerging regions (see Chapter III). Latin American equity markets quickly rebounded after the January sell-off, with indices in Brazil, Chile and Peru trading near their all-time highs in late March. In contrast, Asian equity markets had fallen more than 20% by mid-March, with markets in China, India and the Philippines down the most. In China, in particular, efforts by the domestic authorities to slow the economy, combined with an appreciation of the renminbi against the US dollar and rising food and oil prices, caused equity investors to question the valuations of Chinese corporates, which by late 2007 had exhibited price/earnings ratios near 50. By 18 April 2008, the Shanghai equity index had fallen by almost 50% from its 16 October 2007 peak, eliminating much of the gains achieved earlier in 2007.

Throughout the period of market turbulence, asset values in many emerging economies were supported by perceptions that the downside risks to growth were more limited than for the United States and other advanced industrial economies (see Chapter III). In both emerging equity and credit markets, asset prices thus exhibited a somewhat muted sensitivity to movements in US equity and credit markets relative to earlier periods. For example, in three distinct episodes of sudden and sustained increases in volatility in US equity markets since July 2007, emerging market equity prices held up relatively well, outperforming the S&P 500 during the first 15 trading



<sup>1</sup> Model 1 tracks the time-varying correlation between the daily changes in option-adjusted spreads on the JPMorgan Chase EMBI Global Diversified index for each region and changes in option-adjusted spreads on the Merrill Lynch US high-yield index, estimated using a bivariate GARCH model. Model 2 tracks these correlations estimated with a model which controls for global factors (option-adjusted spreads on the Merrill Lynch US investment grade index, MSCI Global equity index and the S&P GSCI Commodity price index); 10-day moving average.

Sources: Bloomberg; JPMorgan Chase; Merrill Lynch; national data; BIS calculations.

Graph VI.19

days in each period (Graph VI.17, right-hand panel). This stands in contrast to previous periods of turbulence in US markets, when emerging markets tended to underperform.

In part, the resilience of emerging market assets has reflected both robust domestic growth in many countries and support from surging commodity prices. Some statistical evidence drawn from rolling panel regressions seems to confirm this observation (Graph VI.18). The sensitivity to US equity markets, which had been rising in most regions since 2003, started to wane in mid-2006, and then fell significantly after July 2007 as the financial turmoil erupted. Over this same period, the daily changes in commodity prices seemed to emerge as more important drivers of emerging equity returns, particularly in Latin America.

Estimates based on credit spread data provide some evidence of a similar disconnect between emerging market sovereign debt markets and those for US high-yield credit. A simple estimate of the time-varying correlation between spreads in these markets stayed at a relatively high level by historical standards, following a generally upward trend since at least 2004 (green line in Graph VI.19). However, once other US and global factors (commodity prices, global equity prices and US investment grade credit spreads) are taken into account (red line), the correlations showed a more significant drop from 2007, particularly during the recent period of credit market turmoil.

... in both  
emerging equity  
markets ...

... and emerging  
credit markets

## VII. The financial sector in the advanced industrial economies

### Highlights

The period under review was characterised by generalised stress in the financial sector of the advanced industrial economies.

Several years of growth and enhanced profitability for financial firms came to an abrupt halt in 2007 as strains stemming primarily from exposures to residential real estate spread throughout the financial system. Mounting defaults in the US subprime mortgage market led to outsize writedowns in the securitised mortgage portfolios of many institutions. The situation deteriorated in waves after the summer months, with many firms facing funding constraints in the interbank market. It was punctuated by the near failure of sizeable financial firms, prompting intervention by the public sector to avert potential systemic disruptions from a disorderly collapse.

The severity and speed of spreading strains represented a major stress test for the robustness of many innovative structures introduced in the financial sector over the past few years and also highlighted the degree of interconnectedness between markets and institutions. What had started as a problem specific to a segment of the US mortgage market became a source of losses for financial firms worldwide that were holding related securities. Uncertainty about the size and distribution of losses was exacerbated by the complexity of the new structures used in the securitisation process. Retrenchment from risk-taking led to illiquidity, exposing weaknesses in the funding arrangements of many financial firms.

With many financial institutions nursing weakened balance sheets, even as the macroeconomic environment continues to worsen, a turn in the credit cycle seems likely to imply persistent headwinds for economic activity. How the situation will evolve depends critically on the dynamic interactions between the financial sector and the macroeconomy. Reduced credit availability, due to efforts by the financial sector to preserve its capital base, could prolong the period of weak profitability by affecting aggregate spending, economic activity and asset quality. These effects can also be transmitted across borders as weakened banking systems tend to cut back on their international exposures. Beyond the cyclical implications, this period of intense stress also heralds some structural shifts. Financial firms are revisiting assumptions that supported a move towards a business model focused on origination and distribution of loans through securitisation. At the same time, policymakers are reviewing aspects of the prudential framework that failed to perform as intended.

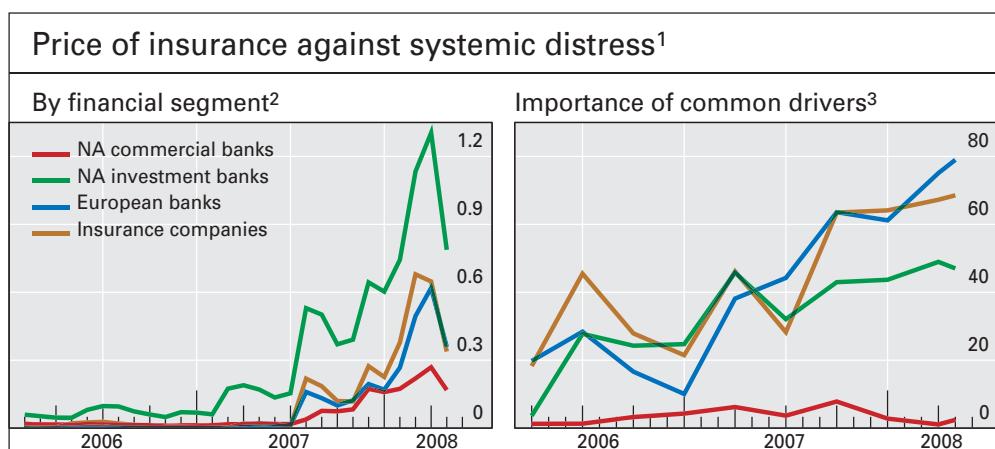
## The financial sector under stress

To varying degrees, the turmoil affected firms in practically all segments of the financial sector of advanced industrial economies. Compared to other episodes of stress in recent memory, it has proved to be both more persistent and more complex. Market participants and policymakers alike have been surprised by how far stresses spread across firms and markets, and by the limited effectiveness of standard policy instruments. The price of insurance against sizeable declines in the asset value of the largest financial firms is a measure of both the degree to which market participants reassessed the likelihood of systemic risk and their waning appetite to bear it. Proxies of this price based on credit derivative prices jumped to unprecedented heights in summer 2007 and remained high throughout the rest of the period under review in all segments of the industry (Graph VII.1). The jump can be attributed to market participants' keener perception of failure risk as well as their view that common drivers of this risk were at play across the different segments of the industry.

This period of intense stress was characterised by three interconnected elements. The first was rates of default on residential real estate loans that were well in excess of the expectations incorporated into loan prices. The second was the failure of many market participants to fully appreciate the inherent complexity and opacity of highly structured financing arrangements, which made exposures difficult to value. As firms scrambled to reprice risks on their balance sheets, they became aware of the sensitivity of valuations to changes in the assumptions underlying their pricing models. Finally, market participants' uncertainty about the size of the underlying losses and their distribution across the system led to a generalised drain on market liquidity, which in turn exacerbated the pricing uncertainties and made for increasingly difficult funding conditions.

Persistent and complex market turmoil ...

... raised the perceived riskiness of financial institutions



<sup>1</sup> In per cent. 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. <sup>2</sup> Risk neutral expectation of credit losses that equal or exceed 15% of the corresponding segments' combined liabilities in 2006 (per unit of exposure to these liabilities). Risk neutral expectations comprise expectations of actual losses and preferences. <sup>3</sup> Asset return correlation implied by the co-movement of CDS spreads for the selected financial firms.

Sources: Bankscope; Markit; BIS calculations.

Graph VII.1

### *Commercial banking*

Banks, whether classified as commercial or universal, were among the institutions hit the hardest during this episode of stress. The writedowns related to US mortgage exposures reported over the period under review made a large dent in the profitability of the industry. Banks' earnings for the calendar year 2007, in which the first wave of writedowns occurred, were at best flat, but in most countries declined compared to previous years (Table VII.1).

A significant drop in profits was reported by US banks ...

... as well as by Swiss and German banks

The pronounced deterioration in bank profits in the United States reflected a general worsening of individual components of income. Net interest margins declined and operating costs rose, reversing a number of years of cost containment. All indicators of credit-related costs moved higher. Loan loss provisions saw their largest increase in 20 years, reflecting the problems in the mortgage markets and, potentially, the gradual slowdown in economic activity and higher delinquency rates. Even so, reserves failed to keep pace with non-current loans, with the result that the cover ratio fell below unity for the first time since 1993.

The picture in Europe was more mixed. While profits generally dipped, operating costs in a number of countries continued on the downward trend of recent years. Loan loss provisions were stable in most countries, and lower profitability seemed to be more closely associated with a decline in net interest margins. The increasing reliance of European banks on market and wholesale sources of funding, the price of which tends to be more sensitive to yield curve movements and risk than the retail deposit base, is a likely factor behind declining interest margins. In some contrast to the overall picture, Spanish banks recorded improved profits, including from interest margins, despite an appreciable increase in loan provisions. The profits of Swiss and German

### Profitability of major banks<sup>1</sup>

As a percentage of total average assets

	Pre-tax profits			Loan loss provisions			Net interest margin			Operating costs		
	2005	2006	2007	2005	2006	2007	2005	2006	2007	2005	2006	2007
Austria (3)	0.85	1.64	1.29	0.30	0.38	0.28	1.64	1.90	2.24	2.10	2.40	2.40
Australia (4)	1.52	1.62	1.67	0.14	0.13	0.15	1.92	1.96	2.01	1.70	1.64	1.63
Canada (5)	1.01	1.32	1.27	0.10	0.10	0.14	1.79	1.64	1.68	3.00	2.56	2.57
Switzerland (6)	0.66	0.87	0.31	0.00	0.00	0.01	0.63	0.53	0.45	1.67	1.73	1.70
Germany (7) <sup>2</sup>	0.38	0.55	0.28	0.06	0.07	0.04	0.65	0.68	0.52	0.96	1.32	0.98
Spain (5)	1.15	1.51	1.65	0.23	0.33	0.41	1.55	1.78	1.94	1.70	1.91	1.96
France (5)	0.76	0.87	0.41	0.06	0.06	0.09	0.93	0.76	0.47	1.47	1.43	1.28
United Kingdom (8)	0.87	0.97	0.67	0.23	0.27	0.23	1.23	1.26	0.94	1.59	1.70	1.36
Italy (4)	1.23	1.12	0.88	0.23	0.26	0.25	1.95	1.93	1.71	2.34	2.34	2.01
Japan (13) <sup>2</sup>	0.66	0.67	0.50	0.12	0.15	0.13	0.89	0.97	0.75	1.05	1.15	0.80
Netherlands (4)	0.58	0.57	0.38	0.05	0.10	0.10	1.09	1.17	0.99	1.29	1.48	1.37
Sweden (4)	0.90	1.06	0.98	0.01	-0.03	0.01	1.03	1.08	1.07	1.07	1.11	1.07
United States (11)	1.93	1.82	1.02	0.20	0.20	0.56	2.72	2.50	2.47	3.44	3.12	3.51

<sup>1</sup> All values are IFRS; the number of banks included is shown in parentheses. <sup>2</sup> Values are a mix of local and US GAAP.

Sources: Bankscope; FitchRatings.

Table VII.1

banks declined very significantly even as loan loss provisions remained fairly flat, arguably because the sources of strain were concentrated primarily in their securities portfolios rather than their loan book. The discovery of the biggest ever incidence of trader fraud in a leading French bank exposed weaknesses in internal controls, but the €4.9 billion loss did not lead to an implosion of the institution.

Banks in the United Kingdom announced significant writedowns from exposures to US real estate, but did not report major overall losses for the year. However, the retail depositor run on Northern Rock, after news surfaced about the bank's difficulties in financing its mortgage portfolio in the wholesale money market, provided an enduring image of a banking system under stress. The rapid deterioration of the bank's liquidity triggered intervention by the national prudential authorities. This initially took the form of an injection of liquidity backed by illiquid collateral. Eventually, however, the lender had to be nationalised in an effort to preserve its value until market conditions improved. To stem any further spread of depositor panic, the government announced a blanket guarantee of deposits with all UK banks. The turn of events also prompted an extensive review by UK policymakers of the institutional arrangements for dealing with distressed banks.

Funding problems led to the nationalisation of a UK institution ...

While Japanese banks saw profits decline in the period under review, they were less affected by the turmoil than their European and North American peers. The ratio of non-performing loans to assets continued to shrink. The decline in provisions was limited primarily because of exposures to consumer finance companies. Overall, Japanese banks' capital adequacy was not affected too severely and their access to funding was not impaired, partly thanks to their large deposit base.

... whereas Japanese banks were less affected by the turmoil

#### Capital and liquidity ratios of major banks<sup>1</sup>

	Tier 1 capital/risk-weighted assets			Non-performing loans/total assets			Net loans/total deposits		
	2005	2006	2007	2005	2006	2007	2005	2006	2007
Austria (3)	7.7	8.9	8.1	2.3	2.1	1.8	56.4	58.1	63.2
Australia (4)	7.5	7.2	6.8	0.1	0.2	0.2	88.3	89.8	85.1
Canada (5)	9.9	10.4	9.6	0.3	0.2	0.2	58.3	56.2	57.2
Switzerland (4)	11.7	11.7	9.8	0.2	0.2	0.1	25.2	26.1	27.3
Germany (7)	8.4	8.4	8.0	1.0	0.6	0.8	36.2	30.4	25.4
Spain (5)	7.9	7.6	7.9	0.5	0.5	0.6	69.9	76.7	76.1
France (4)	8.1	7.9	7.4	1.2	1.2	1.3	32.3	36.5	25.8
United Kingdom (7)	7.5	7.9	7.6	0.8	0.7	0.8	54.8	54.5	51.1
Italy (4)	4.7	5.0	6.6	4.0	3.2	3.1	42.7	49.6	70.9
Japan (10)	7.3	7.9	7.4	1.1	1.0	0.9	53.1	55.1	62.5
Netherlands (4)	10.4	9.4	10.0	0.6	0.6	0.4	54.1	55.8	55.1
Sweden (4)	7.1	7.2	7.1	0.4	0.4	0.3	71.7	74.2	74.9
United States (11)	8.4	8.6	8.0	0.3	0.3	0.6	63.4	63.6	61.5

<sup>1</sup> Weighted averages by banks' total assets; in per cent; the number of banks included is shown in parentheses.

Source: Bankscope.

Table VII.2

Acute problems  
of investment  
banks ...

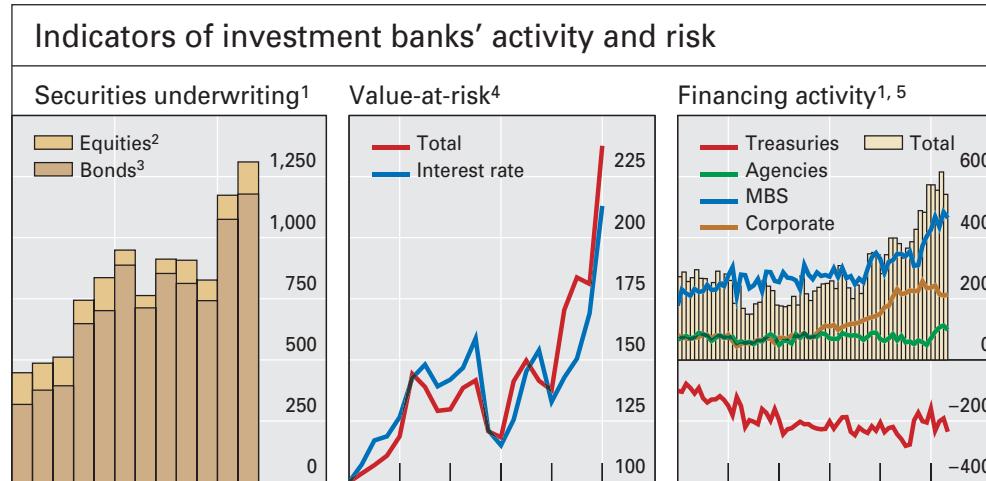
### Investment banking

Investment banking operations have arguably been the segment of the financial sector most affected by the turmoil. Profits declined dramatically, and a number of institutions found themselves needing to raise substantial amounts of new capital. The near failure of one of the largest Wall Street firms marked a low point in the unfolding of events. At the same time, the response of the US authorities in terms of providing liquidity support to the sector signalled a change of attitude that could have long-standing implications for the design of prudential policy.

Investment banks experienced a sharp decline in profitability after August 2007. The return on equity for the largest US and European firms in the calendar year 2007 fell to around 7.4% and 4.6% respectively, less than a third of the record highs reached in 2006. A few firms actually recorded outright negative earnings for the year. Losses on exposures to securities backed by mortgages, consumer loans and related derivatives accounted for the major part of this slump in performance. Trading revenues were cut by half due to the effects of the turmoil on many securities markets. By contrast, earnings were generally supported by income from asset and wealth management as well as by fees from the underwriting of initial public offerings (IPOs) and merger and acquisition advice, at least until the turn of the year (Graph VII.2). However, both these lines of business showed clear signs of weakening in the first quarter of 2008 as the deal flow subsided and many IPOs were withdrawn.

By the nature of their activities, investment banking firms are more exposed to adverse market conditions than commercial banks. They operate on a thinner capital cushion and tend to be more active risk-takers. Without a retail deposit base, investment banks are more reliant on capital markets for fund-raising and on well functioning money markets for their short-term liquidity

... driven by large  
exposures to  
counterparty and  
liquidity risk ...



<sup>1</sup> In billions of US dollars. <sup>2</sup> IPOs in Germany, Japan, the United Kingdom and the United States. <sup>3</sup> Completed international debt securities issuance. <sup>4</sup> Market capitalisation-weighted average of eight large institutions' total and interest rate value-at-risk; Q4 2002 = 100. <sup>5</sup> 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; Dealogic; Thomson Financial; BIS.

Graph VII.2

management. During the financial turmoil, counterparties' uncertainty about the size and distribution of investment banks' exposures to underperforming asset classes resulted in an acute shortage of liquidity. Standalone investment banks that are not part of a larger organisation with commercial banking activities were affected the most. The severity of the financing problems prompted an exceptional extension of access to central bank financing facilities for those securities houses that are also primary dealers in the Federal Reserve's operations (see Chapter IV). Investment banks made extensive use of these facilities in substituting their holdings of mortgage-backed securities (MBS) for government paper as collateral in repo funding operations (Graph VII.2, right-hand panel).

The near collapse of Bear Stearns represented a defining moment in this period of prolonged financial sector distress. This major Wall Street institution found itself at the centre of events in the very early stages of the turmoil because of its leading role in mortgage securitisation. In the summer of 2007, the firm felt obliged to provide support to affiliated hedge funds that had registered large losses on subprime mortgage exposures. In March 2008, the firm's liquidity position deteriorated rapidly, leading the Federal Reserve to intervene. Taking a form of action not seen since the Great Depression, the central bank first extended a loan to the firm using a commercial bank as an intermediary, and then provided financing and guarantees to facilitate a full takeover by that bank a few days later. The extraordinary intervention was aimed at avoiding a disorderly unwinding of Bear Stearns's extensive positions in the cash and derivatives markets that would have compounded market uncertainties and illiquidity. Of particular concern were exposures related to the firm's role as a market-maker in the CDS market and an intermediary in the market for tripartite repurchase agreements. The demonstrated resolve of the authorities to act decisively to stabilise the situation helped reverse the decline in market participants' sentiment and led to a narrowing of spreads and risk premia (Graph VII.1; see also Chapter VI). At the same time, the unconventional nature of the intervention raised issues about its longer-term impact on incentives. A manifest willingness to extend the central bank safety net to investment banks, even under the most extreme circumstances, is likely to have implications for the design of the prudential oversight of such firms, which are not subject to supervision by the central bank.

... prompted official intervention on a large scale

#### *Insurance companies*

Overall, the effect of the financial turmoil on insurance companies was less severe than on banking institutions. Most insurance firms registered positive results, and premium income remained strong. With the exception of monoline insurers, exposures to the asset classes most affected by the turmoil were not widespread. Sizeable writedowns of mortgage-related holdings among some of the larger insurance companies were, with few exceptions, manageable and did not translate into funding liquidity problems as they did for banks.

Despite the general resilience of the insurance sector ...

In the property and casualty segment of the industry, the absence of major natural disasters kept down the costs from claims and helped support

companies' earnings and prudential ratios. Looking forward, however, the continuing upward trend in the frequency of smaller-scale natural disasters may suggest that future cost estimates will need to be revised upwards.

... highly leveraged monoline insurers experienced strain

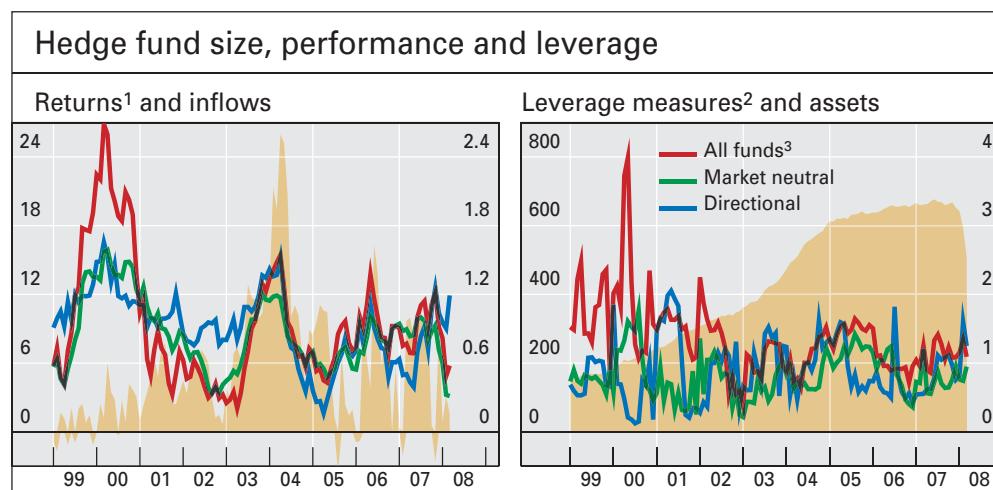
The segment of the insurance sector most affected by the turmoil was the one specialised in offering credit guarantees to bond issuers. The so-called monoline insurance companies, which had traditionally provided guarantees primarily to local government bond issuers, had gradually expanded their business to offer credit enhancements for structured finance products. The collapse in the performance of these products entailed larger than expected payouts on the guarantees, thereby testing the limits of the highly leveraged balance sheets of the monoline insurers. As a result, their credit rating was questioned and the price of their debt plunged (Graph VI.8, left-hand panel). A few smaller companies were downgraded and others were obliged to seek capital infusions in order to maintain the AAA rating that is crucial to their business model. The problems they faced in raising fresh capital prompted the intervention of the supervisory authorities to avoid knock-on effects on other segments of the bond market and other financial firms.

#### *Leveraged investors*

As funding markets tightened ...

The leveraged investor sector was also affected negatively by the stresses in the financial system, albeit mostly indirectly. Market-makers and lenders reacted to weakened balance sheets and reduced profits by tightening funding conditions. As a result, hedge funds and private equity funds had to adapt their risk-taking to the higher cost of borrowed capital.

Even though the first signs of strain to emerge were problems in hedge funds associated with large investment houses, the performance of the industry as a whole initially proved relatively robust. During 2007, returns on most

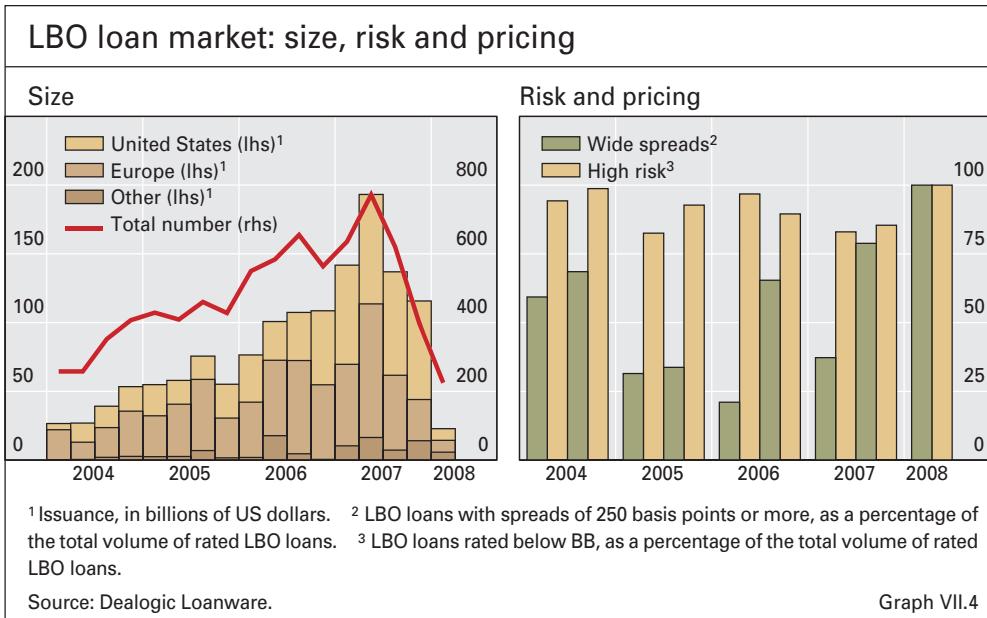


The shaded areas represent hedge fund flows and stocks respectively, indicated by the left-hand scales, in billions of US dollars.

<sup>1</sup> Average annualised excess return (12-month moving average), in per cent, across hedge funds; relative to three-month US Treasury bill yields. <sup>2</sup> 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. <sup>3</sup> Includes all available styles of hedge fund families weighted by assets under management.

Sources: Hedge Fund Research, Inc; BIS calculations.

Graph VII.3



hedge fund strategies compared favourably to those recorded in 2006 (Graph VII.3). The main exception was the performance of fixed income funds, which slipped during 2007. Over the calendar year, net investor inflows to all fund sectors remained at levels comparable to those of the recent past.

During the first months of 2008, a challenging market environment led to disappointing performance for many hedge funds, triggering withdrawals of funds by investors. This was compounded by prime brokers' desire to reduce their exposures by intensifying margin calls and tightening funding terms. Many funds, especially those below the top tier, found it hard to keep their positions open and were forced to liquidate part of their portfolio.

Private equity funds experienced significant pressure during the period under review as funding conditions tightened and investment opportunities narrowed. Successful fund-raising over the past few years created an overhang of investor money that has not been placed in the traditional way for this type of fund. Portfolio investments in structured finance securities resulted in large losses for a few private equity funds and in the high-profile failure of a recently listed entity associated with a top-tier private equity partnership.

Loan activity linked to leveraged buyouts (LBOs) declined substantially during the second half of 2007 and came to a near standstill in the first quarter of 2008 (Graph VII.4). Originators found it increasingly difficult to securitise these loans as other lenders shied away from risk. Concerns about heightened credit and concentration risk arising from the involuntary accumulation of such exposures dried up the flow of financing for such transactions.

#### *Real estate markets and financial firms' writedowns*

Developments in the property market played a central role in the genesis and dynamics of the financial turmoil. Exposures to US residential mortgages, especially to the riskier segments of the market, were the primary source of losses both on direct holdings of mortgages and on holdings of securities

... hedge fund activity eventually shrank ...

... and pressure on private equity mounted ...

... leading to a contraction of the LBO market

The slowdown in property markets ...

Subprime-related writedowns and capital-raising <sup>1</sup>					
	Writedowns			Capital raised <sup>2</sup>	
	Amount <sup>2</sup>	% of profits <sup>3</sup>	% of capital <sup>4</sup>		
Commercial banks <sup>5</sup>	197	102	21	169	
Investment banks <sup>6</sup>	64	163	24	37	

<sup>1</sup> As of mid-May 2008. <sup>2</sup> In billions of US dollars. <sup>3</sup> Pre-tax profits in 2007 (for two commercial banks, 2006). <sup>4</sup> Tier 1 capital in 2007; for investment banks, total equity. <sup>5</sup> Twenty largest commercial banks. <sup>6</sup> Top five investment banks.

Sources: Bankscope; Bloomberg. Table VII.3

related to mortgage debt. From a forward-looking perspective, developments in the property market are also likely to be a key determinant of how the overall situation evolves.

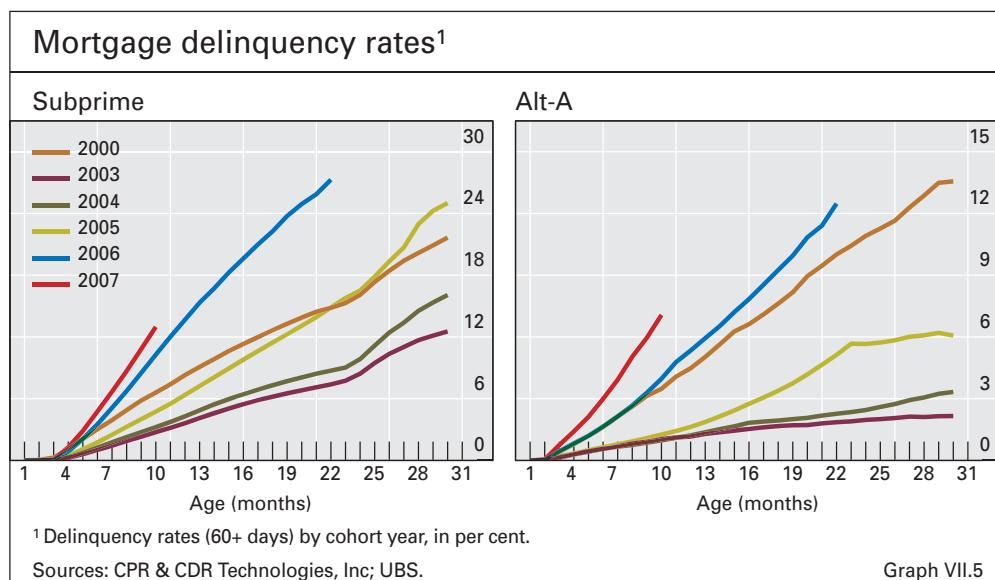
... led to large writedowns by financial firms ...

Most of the writedowns reported by financial firms during the period under review were related to declines in the value of their mortgage-linked holdings. Losses booked since August 2007 were quite severe (Table VII.3). The writedowns reflected the combined effect of an increase in the delinquency rate of mortgage debt and the massive repricing of portfolios of securitised mortgages. The size of the losses prompted a large number of institutions to actively seek to repair their balance sheet by raising new capital.

Losses related to mortgages jumped in the United States as delinquency rates increased. By September 2007, delinquency rates for prime-quality loans had risen to 3.1%, and for subprime loans to 16%. More recent subprime loan vintages exhibited much higher delinquency rates, an indication of the progressive loosening of underwriting standards over the course of the housing boom (Graph VII.5).

... and a revision of pricing models

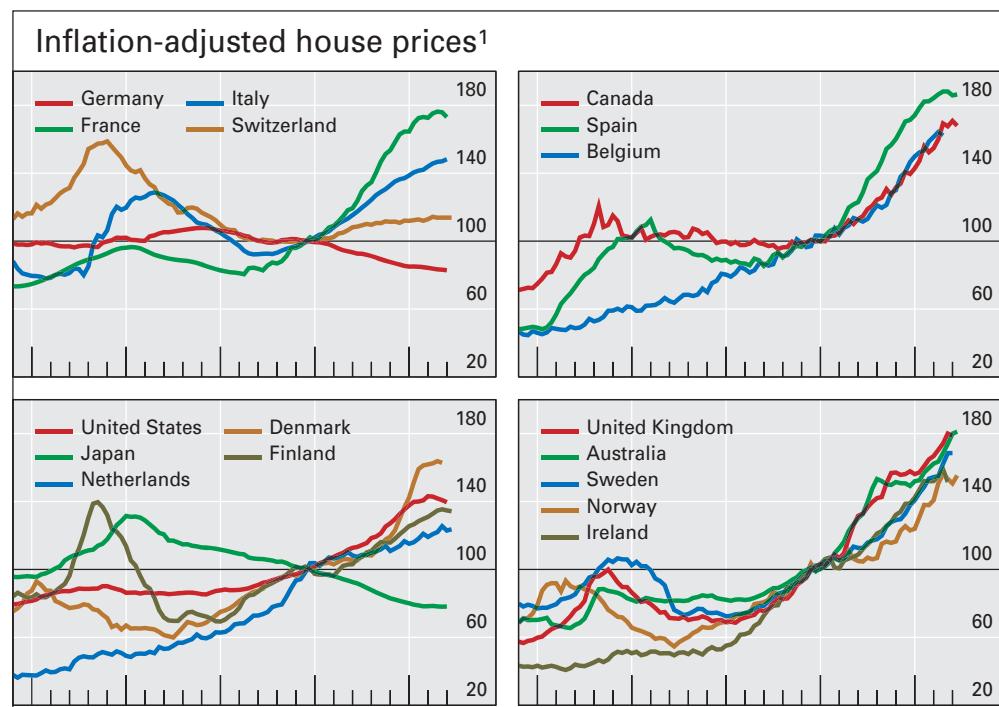
The rise in mortgage delinquencies triggered a re-evaluation of the assumptions underpinning the pricing of mortgage-related securities. Low spreads for pools of securitised mortgages reflected in part the expectation



that highly indebted borrowers would be able to refinance or sell the property easily in a booming housing market, avoiding costly foreclosure proceedings. Moreover, valuations of structured finance products related to mortgages were also based on optimistic assumptions about the closeness of the link between delinquencies and “systematic” risk drivers. As a result, manifestations of higher risk led to large-scale downgrades in the credit ratings of securitised mortgages and a sharp drop in the marked to market value of related structured finance securities.

Two features of structured finance products amplified the price declines. The first was the complexity of the structure governing the distribution of cash flows to different investors. By construction, securitisation redistributed risk by concentrating it in junior tranches. The low expected loss characteristics of senior tranches, however, came at the expense of higher sensitivity to underlying valuation assumptions. Second, since the secondary markets for these securities were fairly illiquid, valuations had been increasingly based on primary market placing of newer vintages of similar structures, or on risk models, rather than on new information about the performance of the underlying pool of assets. As the demand for new securities dried up and initial pricing assumptions had to be revised, the non-linear nature of the structures meant that recorded valuations required very substantial adjustments. This explains why the writedowns reported by financial firms are significantly larger than the actual realised losses from non-performing mortgages.

Transaction complexity contributed to writedowns



<sup>1</sup> Nominal house prices deflated by the personal consumption deflator; 2000 = 100. For France, Germany, Italy and Japan, quarterly house price data are derived from lower-frequency data using Ginsburgh interpolation techniques.

Sources: Various real estate associations; national data; BIS calculations.

Graph VII.6

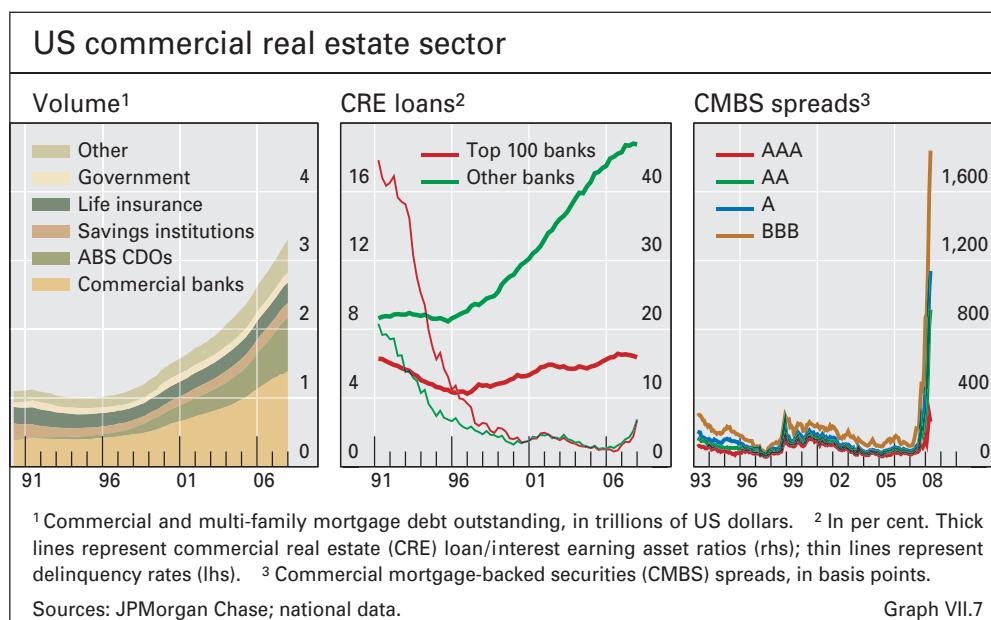
A significant decline in house price inflation ...

Property market trends have been key in determining the course of the current cycle. Residential real estate prices halted their upward trend during the period under review (Graph VII.6). In most countries, house prices stabilised or their growth moderated substantially. In the United States, house prices fell. The decline in the national average price index masks considerable diversity in the performance of local markets. The areas where prices grew the fastest in the past few years were also those where prices have recently dropped most. Also, house price indices that are more sensitive to properties in large metropolitan areas and those financed by large or not fully documented mortgages show annual price declines in the order of 12%. More generally, the global flattening of the rate of increase in house prices can be attributed primarily to a decline in housing demand, which in certain countries came on the heels of a recent construction boom. Higher interest rates for mortgages, an incipient economic slowdown and elevated levels of household indebtedness have to varying degrees played a role in the slackening demand for housing in different countries.

... spilled over to the commercial real estate market

The slowdown in property prices also affected the commercial real estate sector. Commercial property prices had accelerated in a number of countries over the past few years, albeit starting from a lower level than residential markets and showing more diversity across countries (Table VII.4). Bank exposures to the sector have also increased. Direct exposures to commercial real estate account for almost 14% of the assets held by US banks, with the share having jumped from 19% to 33% in the case of medium-sized banks over the past six years (Graph VII.7).

There were, however, accumulating signs of investors' heightened sensitivity to commercial property risk during the period under review. The trend increase in the issuance of securities backed by commercial property investments was reversed during the past year. At the same time, spreads on such securities widened very substantially (Graph VII.7, right-hand panel). This



	Commercial property prices <sup>1</sup>						
	Nominal change <sup>2</sup>			Level <sup>3</sup>	Memo: Office vacancy rates <sup>4</sup>		
	1998–2006	2006	2007	2007	2005	2006	2007
United States	3.2	12.3	15.9	47.1	13.9	12.6	12.8
Japan	-3.1	19.6	11.9	21.4	3.9	3.0	2.1
Germany	-2.1	-5.1	-1.3	34.9	11.6	9.9	9.8
United Kingdom	5.4	17.2	-4.8	64.7	7.3	5.7	4.2
France	6.0	15.0	11.8	78.0	6.5	5.1	5.2
Italy	10.2	1.3	3.9	86.0	6.1	6.1	5.8
Canada	3.3	12.9	11.6	64.7	12.1	10.5	7.2
Spain	10.0	10.7	5.9	76.1	6.1	3.4	4.3
Netherlands	2.4	4.3	4.6	83.1	13.6	11.7	10.6
Australia	2.7	10.8	14.9	50.6	9.0	8.1	4.7
Switzerland	1.3	-0.0	0.6	60.2	11.5	10.9	10.2
Sweden	3.0	9.8	9.4	51.4	16.8	15.4	11.7
Norway	2.8	10.7	12.4	69.7	9.0	8.2	4.5
Denmark	8.4	9.6	5.6	100.0	7.9	5.0	4.3
Finland	0.5	1.8	3.3	56.9	9.0	8.1	7.0
Ireland	10.5	21.7	6.1	100.0	15.2	12.0	11.3

<sup>1</sup> For Australia, Italy and Spain, prime property in major cities; for Japan, land prices. <sup>2</sup> Annual changes, in per cent. <sup>3</sup> Peak period of real commercial property prices = 100. <sup>4</sup> Immediately vacant office floor space (including sublettings) in all completed buildings within a market, as a percentage of the total stock. For Switzerland and the United States, nationwide; for Australia, France, Germany, Italy, the Netherlands and Spain, average of major cities; for other countries, largest city.

Sources: Catella Property Consultants; CB Richard Ellis; Investment Property Databank Ltd; Japan Real Estate Institute; Jones Lang LaSalle; National Council of Real Estate Investment Fiduciaries; Sadolin & Albæk; Wüest & Partner; national data.

Table VII.4

evidence contrasts with reports of a gradual weakening in lending standards during the past few years, similar to that observed in residential mortgage markets.

### The turmoil in perspective

The episode of stress that dominated the financial landscape starting in mid-2007 arguably ranks among the most serious in recent experience. It affected a large number of financial institutions and proved to be more persistent than many other instances of generalised financial sector instability. From the perspective of policymakers, some of the most important questions raised by the turmoil relate to the interactions between the financial and real sectors of the economy. A key question is whether the credit cycle may be leading the business cycle as financial institutions respond to weakened balance sheets by tightening the supply of credit. Moreover, the transmission of stress through the international banking market indicates that economic spillovers may be broader than suggested by the original stress points. A final set of questions relates to systemic risk and to the role of the originate-to-distribute model of financial intermediation in shaping its nature.

### The credit cycle

Large losses forced banks to ...

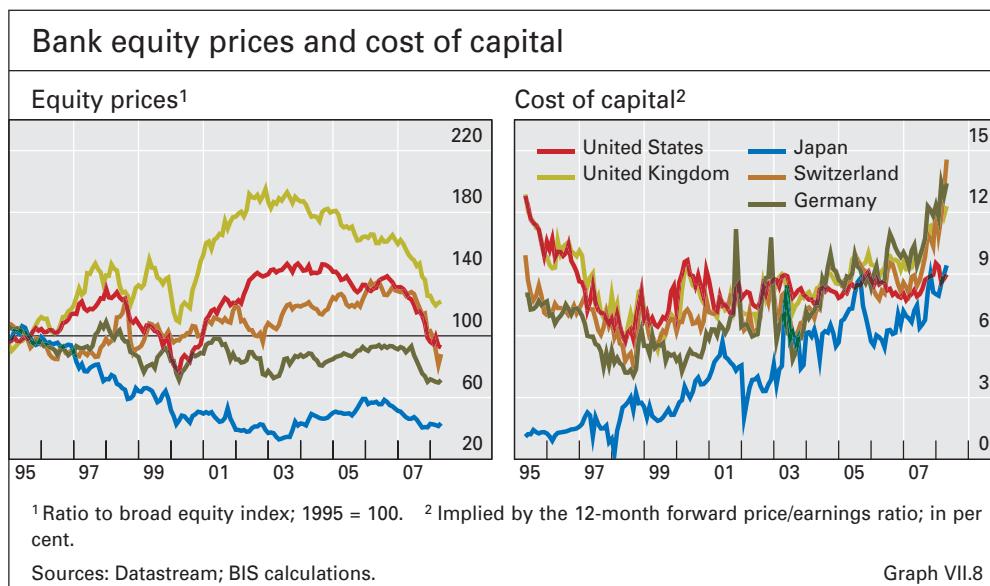
The intense strains over the period under review have forced financial firms to overhaul their business plans. In many cases, firms that saw their capital base shrink had to resort to emergency recapitalisation to maintain their franchise value in their respective areas of activity. A key question looking forward, however, is the extent to which the repercussions of the turmoil will affect the supply of credit to the non-financial sector.

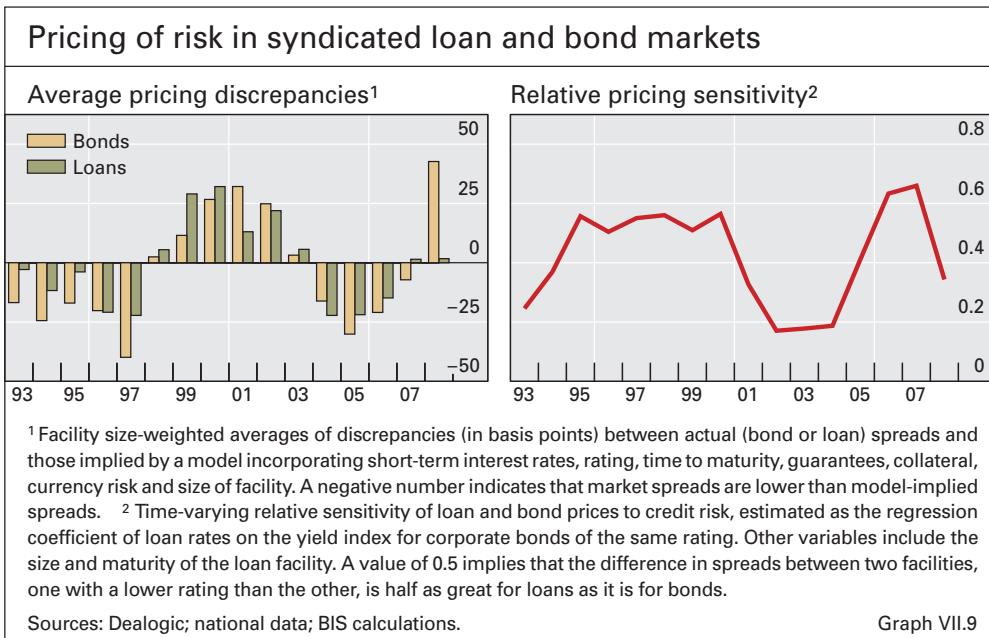
... raise fresh capital ...

Writedowns of mortgage-related assets and the prospect of further deterioration in asset quality prompted many banks to take action to repair their balance sheets. Most explicitly, many large institutions have done so by raising fresh equity capital through private or public rights issues to the tune of \$200 billion (Table VII.3). This has been particularly costly in an adverse market environment where investors' concern about the fragility of financial institutions' performance has weighed on their share prices (Graph VII.8). Nevertheless, for a number of institutions, the financial and reputational costs of immediate action have been outweighed by the benefits of avoiding a further tightening in the availability of capital and being able to maintain capital buffers sufficient to support the value of their business franchise. These efforts have also received the endorsement of supervisors, who have encouraged banks to review their capitalisation levels with a critical eye and address weaknesses in a timely way.

... and tighten credit

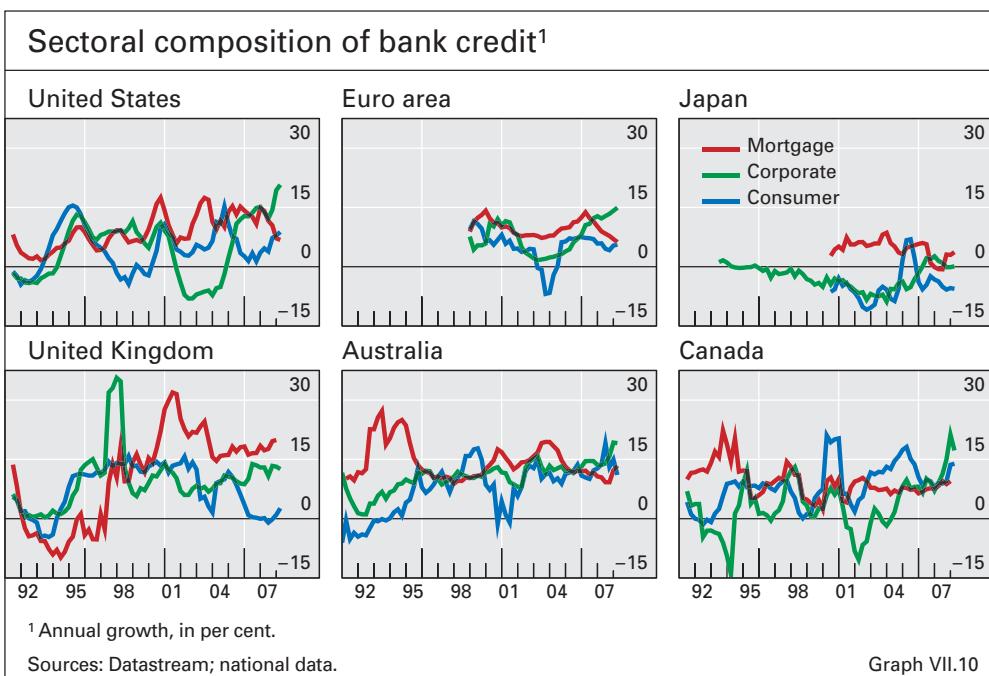
Another, more widespread reaction among financial firms has been a more defensive positioning in terms of asset growth. Asset deterioration led lenders to retrench from the hardest hit market segments, such as mortgage loans and consumer credit. Survey evidence points consistently towards a tightening of credit standards in these areas. This is true not only in the United States, where the performance of these credits demonstrably worsened, but also in Europe, where problems with such loans have been much less pronounced (see the discussion in Chapter II and evidence in Graph II.12, right-hand panel). There are indications that credit availability to the corporate





sector is also under pressure, with banks being more demanding in their lending terms. Of particular note has been the disappearance of loan contracts with looser covenants, which had become increasingly prevalent during the recent boom in leveraged financing. Credit spreads have also generally widened, although this increase has been more pronounced in the bond than in the loan market (Graph VII.9).

Aggregate credit growth rates have declined moderately from their recent peaks in many countries (Graph VII.10). For a number of reasons, however, these statistics may in some cases underestimate the contraction in the supply of credit. One reason is that, as a result of the underperformance of securitised

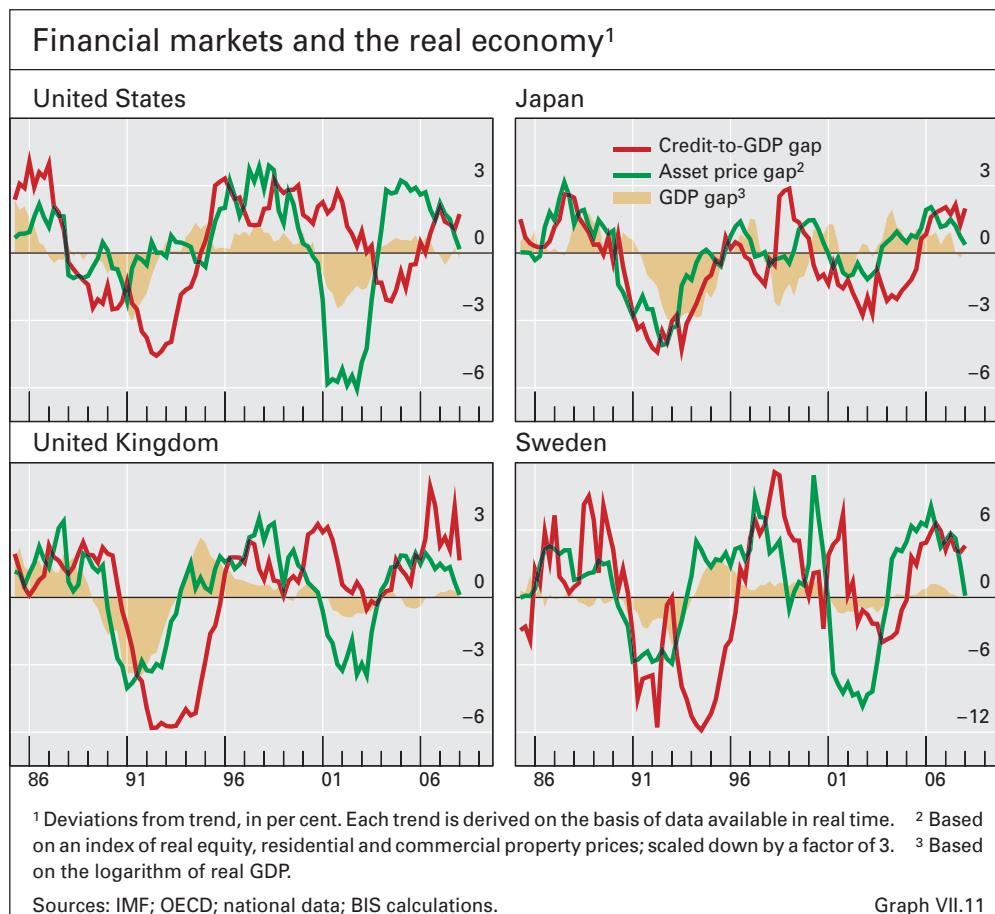


Credit cycle  
developments are  
intertwined with ...

instruments, sponsoring banks brought back onto their balance sheets portfolios that had been housed in separate legal entities as part of the securitisation structure. These decisions were dictated partly by existing funding commitments to these separate entities and partly by a desire to minimise the reputational costs to the franchise name of the firm from eventual failures of such vehicles. A second reason is that many large banks that had used loans to fund LBOs in the late stages of the leveraged financing boom found themselves holding large portions of these exposures when the secondary market for such loans dried up in summer 2007. The overhang of these loans, estimated by market observers to have neared \$250 billion at its peak, weighed on the banks' balance sheets. The gradual market reopening towards the end of the period under review was in part stimulated by interest from private equity funds. A final reason why the overall numbers may overstate the supply of new credit is that, once credit has started contracting, borrowers in need typically draw down from existing credit lines with their banks.

The evolution of credit availability in the near and medium term will depend on a number of factors. Two key factors, closely interlinked, are how far banks succeed in replenishing their capital reserves and how the quality of their assets develops. The latter is in turn intimately tied to developments in the macroeconomy.

Previous episodes of financial sector stress can offer some guidance as to what can be expected, albeit far from an exact prediction. The similarities



between the current turn in the credit cycle and others that have occurred over the past 20 years are evident when one examines the patterns of credit expansion, asset prices and economic activity (Graph VII.11). Regardless of the specific features of past episodes of distress, they were typically preceded by periods of faster than average credit growth and by asset price booms, driven very often by property prices. These periods of credit growth were associated with looser credit standards and a lower price of risk (Graph VII.9, left-hand panel), and typically mirrored a strong upswing in economic activity.

... the performance of the real economy

The reversal of the process in the downswing of the cycle was often fairly abrupt. Financial sector indicators typically led real economic activity as credit growth contracted and asset prices declined in advance of GDP and spending. The health of financial institutions deteriorated during the downswing, as suggested by the declining values of performance indicators. While it is difficult to derive general causal linkages from this evidence, the dynamics of financial sector strength, credit and asset price growth and real sector activity do highlight their close interdependencies.

Looking beyond the near-term horizon, the main risks appear to be linked to the response of aggregate demand to the weakened position of banks and tighter lending standards. Debt levels of households in many countries remain high and tighter credit supply is likely to have an impact on spending patterns (see Chapter II). The level at which house prices will eventually converge and the length of this stabilisation period would be a very important factor in the economies where housing booms have been the most pronounced.

#### *The international banking market and the transmission of stress*

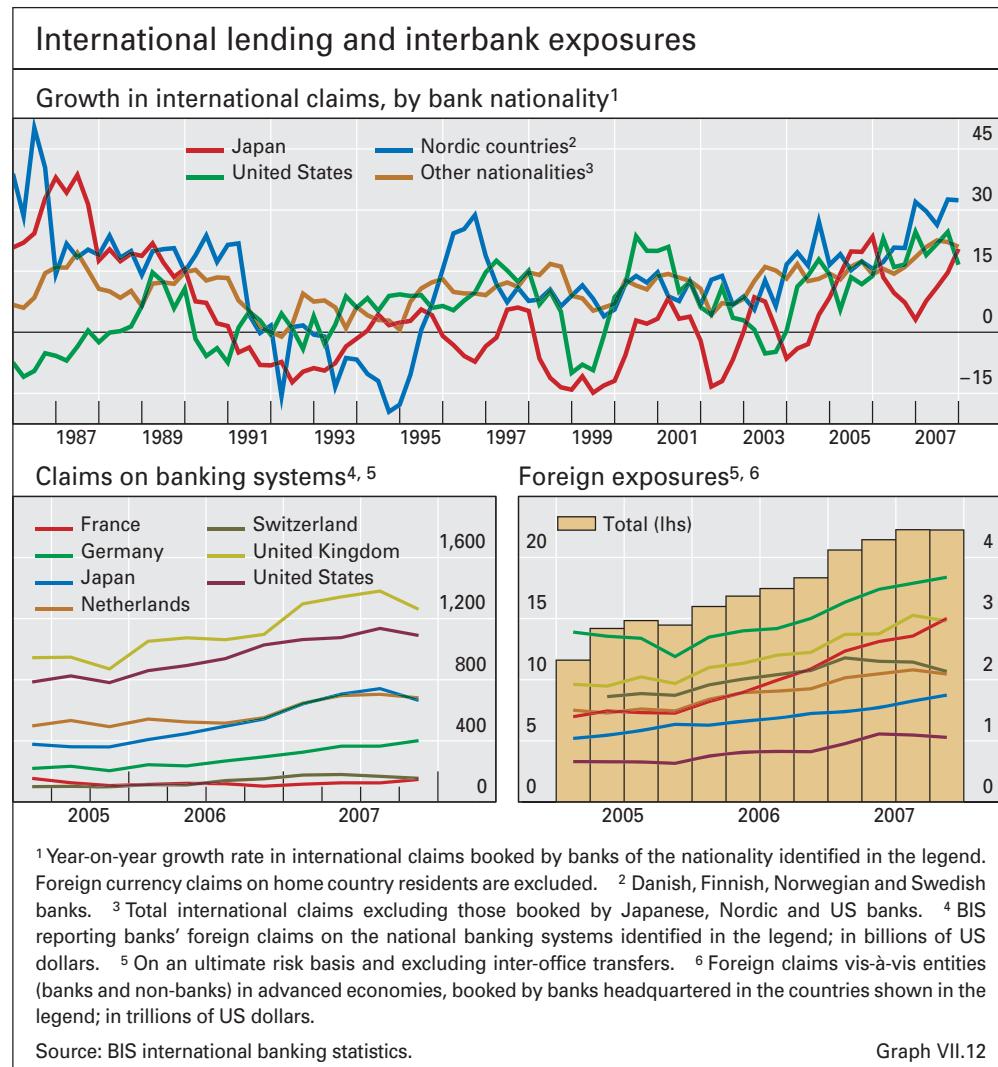
The growing internationalisation of finance implies that the health of a country's banking system can be important beyond the borders of the domestic economy. A number of large institutions lie at the centre of the international banking market. Their continued difficulties can affect financial conditions across national boundaries.

The stress may have international consequences via ...

The 1990s offer examples of banking crises in advanced industrial countries with direct international consequences. Japanese banks scaled back their international operations in response to the non-performing loans problem caused by the bursting of the asset price bubble (Graph VII.12, top panel). As a result of a prolonged period of generally negative growth, Japanese banks' share in international claims fell from 38% in 1990 to less than 8% in 2007. The Nordic banking crisis had a similar effect in curtailing locally headquartered banks' international claims, albeit from a much smaller base. Instances where US banks' international operations contracted are also associated with periods of domestic financial strain, notably in the late 1980s, the early 1990s and autumn 1998.

In each of these cases, the banks affected reduced credit channelled through their international offices in multiple locations. These cuts therefore represented negative shocks to credit supply in the host country, induced by conditions at the banks' headquarters in the home country. By contrast, throughout most of this period, international credit extended by their

... a reduction in cross-border lending ...



international peers exhibited a more muted cycle, and posted negative growth only briefly in 1992.

The international banking market has grown significantly since then and with it the potential international impact of a similar retrenchment today. International claims of BIS reporting banks rose from \$6 trillion in 1990 to \$37 trillion in 2007 (equivalent to over 70% of world GDP), with total claims on emerging markets topping \$4 trillion, including cross-border credit and claims extended locally by foreign banks. The withdrawal of institutions from a major national banking system from international lending could affect advanced industrial economies as well as constrain the financing of emerging markets (see Chapter III). Several emerging markets in Europe and Latin America have become more reliant on foreign bank credit, either through cross-border transactions or via local branches. That said, data available up to end-2007 show bank lending to emerging markets continuing to accelerate, in contrast to banking activity between advanced industrial economies.

Even if the condition of internationally active banks might be considered less problematic now than in the early 1990s, their common market exposures (including to US mortgage-related assets) have increased and the institutions

... and interbank linkages

are now more highly interconnected through interbank linkages, credit commitments and guarantees. Tentative signs of a credit contraction have started to emerge. Internationally active banks have started to reduce their direct exposures to various national banking systems. Interbank exposures to UK, French and US banks declined the most, followed by those to German and Swiss banks (Graph VII.12, bottom left-hand panel). In turn, several major banking systems including those from Switzerland, the United Kingdom and the United States are showing signs of curbing their total international exposure (bottom right-hand panel). The presence of such extensive international bank linkages generally underscores the point that continued strains at internationally active banks have the potential to produce a retreat from international lending that could be felt well beyond the main financial centres.

#### *The originate-to-distribute business model*

Many elements of the recent credit market turmoil mirror features of past financial cycles and, as such, form part of the mechanisms that bring about the alternation of periods of financial booms and sharp contractions. A relatively novel element specific to the latest episode is the central role of the so-called originate-to-distribute (OTD) business model for financial intermediation. This model relies on the dispersion of originated exposures through markets for risk transfer, and a layered structure of players is involved in different stages of the process, from origination and repackaging to the ultimate bearing of the risk. While securitisation is not a recent innovation, its growth in recent years had accelerated substantially, supported to a large extent by the introduction of more complex structures.

The growth in securitisation markets was an integral part of the expansion phase of the current credit cycle. Financial innovation, in the form of new structures that govern the distribution of cash flow generated by the securitised assets to the ultimate investors, was an important factor behind the abundant supply of credit to households and firms. The repackaging of mortgages into tranched securities with different risk characteristics energised funding from various types of investors with varying degrees of risk tolerance. Moreover, the wider distribution of the risk across the financial system arguably contributed to the compression of risk premia, as investors felt better able to match their risk appetite to the composition of their portfolios.

Conversely, the market turmoil that ushered in the contraction phase of the cycle exposed some of the weaknesses in this business model of financial intermediation, and especially in some of the practices introduced in the most recent period. These weaknesses relate primarily to the interactions between the incentives of individual participants in the securitisation chain and the quality of the information flow. A successful securitisation process relies on complementarities between the roles of different participants to ensure that decisions at every stage are based on adequate information and are conducive to better allocation of risk and economic resources.

Originators play a key role in the success of a securitisation structure. Information generated by other parties at subsequent stages is at best only an imperfect substitute for the asset quality assessment made by originators.

The new originate-to-distribute business model ...

... facilitates risk transfer ...

... but harbours structural weaknesses ...

... in the process of loan origination ...

Information deficiencies stemming from the lack of due diligence or lax underwriting standards at this initial stage are very difficult to overcome. These weaknesses were evident in the securitisation market for subprime mortgages. Competition between originators who never intended to bear the risk and were motivated solely by income tied to the origination volumes contributed to a decline in standards of verification and documentation of mortgages. In the most extreme cases loans were granted to borrowers who would clearly not be able to repay them except under very optimistic scenarios of future house price appreciation.

Financial intermediaries specialising in the creation and management of securitisation vehicles face similar incentives as originators. Their income is primarily linked to the volume of business rather than to the underlying risk-return profile of the securitised assets. They typically bear only a small portion of the risk, and in the prevailing euphoria of the market boom they were able to substantially reduce this exposure. Further, the creation of complex structures that insert several layers of securitisation between the original asset base and the cash flows to the ultimate risk bearers often obscured the risk borne by the structures' managers.

... securitisation ...

A key role for the ultimate investor and bearer of risk is to inject discipline into the securitisation process by demanding and receiving pertinent information about the underlying risks before taking positions. The incentive to do this was weakened, however, by the fact that new and complex securitisation transactions resulted in very large portions of these holdings being structured as senior claims and receiving the highest creditworthiness assessments by rating agencies. The compensation of investors in this class of claims, while generous compared to other similarly rated instruments, is not substantial enough to justify the effort of performing a full review of the underlying risks in highly structured transactions. Hence, their decisions rely on external risk assessments and due diligence performed by the so-called "mezzanine" investors, who hold less senior and higher-yielding claims. However, their capacity to screen and instil financial discipline was undermined by the very substantial volume of securitisation issues that came to the market in the past few years, overstretching their resources. In addition, the practice of layered securitisation, which created new structures and more senior claims from the packaging of mezzanine tranches of securitised assets, further lessened the ability of this class of investors to reliably assess and monitor the risks.

... and rating assessments

The growth of more complex forms of securitisation may have weakened the incentives of originators and managers to do due diligence and elevated the importance of credit ratings for the functioning of the market. Investors in the more senior tranches placed increased weight on the credit rating agencies' assessment, often without regard to the fact that credit ratings focus mainly on average (or expected) credit losses and do not fully describe the potential range of those losses. In fact, the complexity of the more layered securitisation structures meant that this range of potential losses was much wider than for similarly rated loan or bond exposures. Ratings also abstract from the possible losses stemming from the interaction between market and credit risk drivers,

which are also more pronounced in the context of some of these structures. Indeed, as a result of the lessons learned from the turmoil, investors seem to have shunned complexity, and rating agencies have started looking for ways in which to better communicate the important nuances in their assessments.

In spite of its identified shortcomings, amply illustrated during this period of stress, the potential benefits of the OTD model for individual institutions and for the efficiency of the financial system as a whole remain. The main challenge facing market participants and policymakers is to address these shortcomings while enhancing its positive features. Several efforts are in train. Private sector initiatives include moves towards more complete documentation at origination and better dissemination of information throughout the securitisation chain, a heightened recognition that discipline is stronger when participants in every step of the process retain sufficient exposure to the overall risk, and efforts to refine the assessments by rating agencies. Policymakers are also seeking to incorporate the lessons learned about the risks inherent in more complex securitisation structures in designing and implementing prudential standards and to address the weaknesses exposed by the links between market and funding liquidity and overall risk in financial institutions.

Initiatives to overcome these shortcomings

A general lesson derived from the financial turmoil is the close interdependence of markets and institutions in the functioning and resilience of the financial system. The OTD model of financial intermediation is based on the premise that risk is ultimately shifted to the investors through market transactions. However, as the events during the period under review demonstrated, it is the capital of financial institutions that in the end underpins the stability of all these transactions. As mentioned above, originators and managers of securitised assets found themselves under pressure to provide support to the securitisation structures and investment vehicles with which they were associated. Uncertainty about the ability of institutions to sustain losses from related exposures engendered a general distrust of securitised assets and brought activity to a halt not only in the market for seasoned securities but also in the primary market for new transactions. Finally, as money market liquidity evaporated, the funding of off-balance sheet vehicles became entirely dependent on the ability of the sponsoring financial institutions to meet their backup liquidity commitments.

From a policy point of view, this interdependence between financial institutions and markets argues in favour of strengthening the macroprudential elements in the design of the framework and the calibration of its instruments. The shortcomings of the originate-to-distribute model can be attributed mainly to the failure of individual players to develop a holistic view on the risks due to excessive focus on their narrow, individual perspective, losing sight of system-wide drivers of risk and interdependencies. Policy that has a similarly narrow focus can also fail to take *ex ante* preventive action as the risks of disruptive interactions build up. At the same time, the management of the period of stress has already shown that, to be effective, policy responses may entail interventions aimed at easing the strain in the markets while at the same time helping institutions to cope with distress.

## VIII. Conclusion: the difficult task of damage control

The current market turmoil in the world's main financial centres is without precedent in the postwar period. With a significant risk of recession in the United States, compounded by sharply rising inflation in many countries, fears are building that the global economy might be at some kind of tipping point. These fears are not groundless. A powerful interaction between financial market innovation, lax internal and external governance and easy global monetary conditions over many years has led us to today's predicament. Rather than seeking to apportion blame, however, thoughtful reactions must be the first priority.

Looking forward, it is crucial to put emphasis on all these elements, and their interaction, and not just on the recent innovations in financial markets that have received so much attention to date. Too narrow a focus has two dangers. First, it points to remedial policies of limited scope that could prove inadequate to manage a crisis with deep roots in the real economy as much as in the financial sector. In particular, we need to address directly the problem of bad debts and high debt service burdens built up over many years in some major economies. The temptation rather to use still more credit expansion and higher inflation to paper over these problems must be firmly resisted. Second, a focus on shortcomings in recent financial innovations tempts policymakers to address symptoms, not underlying causes, in taking measures to avoid similar problems in the future. It is unquestionably important to identify "what is different" about our current problems, but we must also recognise "what is the same".

It cannot be denied that new developments in financial markets, in particular inadequacies in the implementation of the originate-to-distribute model, have had calamitous side effects. Loans of increasingly poor quality have been made and then sold to the gullible and the greedy, the latter often relying on leverage and short-term funding to further increase their profits. This alone is a serious source of vulnerability. Worse, the opacity of the process implies that the ultimate location of the exposures is not always evident. How then to clear up the debris if it is not even clear where it lies?

These financial innovations have heightened what seems to be an inherent tendency to "procyclicality" in liberalised financial systems. That is, as credit expansion fuels cyclical economic growth, asset prices and optimism rise while perceptions of risk recede. This further supports credit expansion, not least through the provision of more collateral to allow more borrowing, leading to spending patterns that could eventually prove unsustainable. Initial rational exuberance might in this way become irrational, setting the stage for a possible subsequent collapse.

Nor can it be denied, again as seen many times in the past, that there were also deficiencies in both the internal governance and external oversight of financial institutions. Individual firms have suffered huge losses, and forced

recapitalisations will dilute future returns for current shareholders. Small wonder, then, that shareholders are outraged at the behaviour of both managements and supervisory boards. Moreover, as evidence has accumulated that the financial system as a whole is no longer functioning effectively, those charged with prudential oversight must also ask themselves what went wrong. How, for example, could a huge shadow banking system emerge without provoking clear statements of official concern? Perhaps, as with processes for internal governance, it is simply that no one saw any pressing need to ask hard questions about the sources of profits when things were going so well. One consolation is that those elements of Basel I that contributed to the excesses, in particular the effective absence of capital charges on off-balance sheet entities related to banks, will no longer play such a role under Basel II. The sooner the new framework is fully implemented the better.

Finally, it cannot be denied that a still more traditional factor was also at work. Real interest rates – globally, and not just in a few advanced industrial economies – have been at unusually low levels for much of this decade. With inflation initially low and stable, policy rates, long-term rates and risk spreads failed to increase commensurately as global growth rose to record levels. The expansion of monetary and credit aggregates surged, while foreign exchange reserves rose by unprecedented amounts as emerging market economies intervened massively to keep their exchange rates from appreciating. Moreover, as with low interest rates, the global trend towards faster monetary and credit growth was seen in almost every major region of the world.

One plausible explanation for this extended period of easy monetary and credit conditions is that central banks have not yet fully adjusted their domestic policies to reflect increasingly important global influences. For many years, global inflation was maintained at low levels, aided by the tailwinds of numerous positive and overlapping supply shocks arising from deregulation and technical progress, but perhaps due even more to the entry of major emerging economies into the global trading system. However, instead of temporarily allowing inflation to drift lower, analogously to the past treatment of negative supply shocks, policymakers interpreted this quiescence of inflation differently. They took it to mean that there was no good reason to raise interest rates when growth accelerated, and no impediment to lowering them when growth faltered. It is not fanciful, surely, to suggest that these low levels of interest rates might inadvertently have encouraged imprudent borrowing, as well as the eventual resurgence of inflation. Similarly, there are dangers in saying that food and energy prices can be ignored in setting domestic policy because they are externally driven. For the world as a whole, these are not external supply shocks, but rather seem to have been primarily demand-driven. These examples indicate that our domestic frameworks for policymaking need to be better adapted to the realities of globalisation.

Given the variety of the influences underlying current economic and financial difficulties, their interactions and their long-standing nature, we should not expect a quick and spontaneous return to normalcy. Nor should we expect quick and easy policy solutions. The likelihood that cleaning up after past

excesses will prove difficult has an important implication: it adds weight to the argument that we need to use policy measures to lean against such credit-driven excesses in the first place. While introducing a new framework for policymaking clearly presents difficulties, surely the massive economic costs incurred in past crises of this sort warrant a serious investigation of the possibilities for change.

### How great are the risks to the outlook?

Against this background, while most commentators expect some slowing of global economic growth, there is an exceptional degree of uncertainty as to how severe the slowdown might be. One need only consider the widening dispersion of views in the consensus forecast, as well as the unusual differences between the forecasts of some national authorities and those of the IMF. Divergences in the stance of monetary policy across the major regions, while reflecting many influences, are also consistent with different assessments about how severe the effects of the current turmoil might become for national economies. Nor is there a great deal more certainty with respect to the prospects for inflation, with incoming news increasingly suggesting that it is more likely to rise further than to suddenly fall. As a result, some see parallels today with the early 1970s, when inflationary pressures rose sharply, and others with the early 1990s, when banking systems and the economy were weakened by an overhang of private sector debt. In the end, both might well prove right.

Looking back in time provides some clues as to why such a high level of uncertainty currently prevails. How we got to where we are now was itself highly unusual. On the real side, the impact of globalisation in recent years has already been noted. But consider as well the unprecedented reliance on household spending and debt accumulation in many countries during the last upturn. On the financial side, there has been unprecedented growth in volumes in many markets, a whole host of new instruments and many new players. And on the policy side, the degree of sustained fiscal and monetary stimulus needed to ensure recovery after the slowdown of 2001 was also unprecedented. Against this background, and that of the continuing turmoil in financial markets, it is simply implausible that traditional forecasting models would continue to work well, if indeed they ever did.

Looking forward in time, there is significant uncertainty as to the extent of the damaging effects on growth of a number of interactive processes. There are interactions within the financial sector, within the real economy and between the real and financial sectors, and potential contagion across geographical regions. To these vulnerabilities must be added the inhibiting effects on the real economy of rising inflation, and potential disruptions arising from global trade imbalances. Lurking behind many of these processes is the spectre of deleveraging, after many years of debt accumulation, and the problem of the fallacy of composition. That is, as individual economic actors try to deal sensibly with their own problems, they may only make everyone else's problems worse. Such processes can be highly non-linear, potentially

leading to much slower global growth than is generally expected and, for a time at least, also to higher inflation.

Within the financial sector, the most important interaction is that between institutions and markets. Finding it hard to estimate their own future capital and liquidity requirements, as losses have mounted and balance sheets have swollen involuntarily, banks in the main financial centres have already cut back on credit to financial sector borrowers and have tightened margin requirements. This could well intensify. In turn, those borrowers who cannot meet more onerous credit conditions could be forced to sell assets into markets which remain illiquid in spite of extraordinary efforts by central banks to resolve this problem. The impact of such "fire sales" on prices, and on the capital of financial institutions, could be substantial. Potentially, such developments could also do further damage to market liquidity if previous market-makers, starved of funding liquidity, were forced to reduce their activities further.

Within the real sector, the principal concern is that households facing heavy debt burdens, and sometimes falling house prices, will seek to raise secularly low saving rates by cutting consumption quite sharply. The fact that in the United States and some other advanced industrial countries the stocks of houses, cars and other durables already seem rather high could encourage such behaviour. Unfortunately, everyone cannot save more simultaneously, since one person's spending is another person's income. The end result of such a process would be lower economic activity and employment, not only in these countries, but also in those reliant on exporting to them. Nor would higher US investment be likely to fill the gap. In such circumstances, corporations might well judge that the demand for their products was unlikely to recover for some time and would simply hold back spending while cutting costs. Evidently, a related fall in the effective value of the US dollar would create domestic jobs and reduce the US trade deficit, but this would only add to the discomfort of exporters in other countries.

Between the financial and real sectors, there could also be worrying interactions. Of greatest concern at the moment is that still tighter credit conditions will be imposed on non-financial borrowers. While the corporate sector globally is hardly cash constrained, this cannot be said of many large firms that have recently been involved in leveraged buyouts. Moreover, the financial position of the household sector in many countries is not good. Simply losing the ability to withdraw equity from houses has, in the United States at least, already had a significant effect on spending. But even tighter credit conditions could exacerbate such trends, leading to more job losses and bankruptcies, which would again feed back on the financial system.

Given the possibility of such a worsening economic and financial environment, it would not be surprising if asset valuations also came under further pressure, with house prices still of prime concern in many countries. In the United States, the inventory of unsold houses remains particularly high, and could well increase further if homeowners are tempted to walk away when the value of their house falls below their mortgage obligations. This would be another direct charge on the capital of the lenders, and would further increase the downward pressure on US house prices, as well as the prices of

all financial instruments backed by such mortgages. In a number of countries, commercial property prices are also beginning to soften, a development which traditionally has been bad news for lenders. Clearly, these real-financial interactions are potentially both complex and dangerous.

Globalisation increases the possibility of contagion across geographical regions. There can be little doubt at this point that the US economy is facing serious difficulties, and has the greatest potential to be hurt by interactions of the sort just described. Moreover, there are suspicions that a number of other countries with low household saving rates might be similarly, if perhaps less significantly, exposed. Nevertheless, there continues to be hope that the slowdown will spread to other countries only in a much attenuated form. In Europe, the centre seems fundamentally strong, though the periphery is another story. Problems in the construction sector in Spain and Ireland are already quite evident, while some countries in eastern Europe have been running remarkably large current account deficits. As well, their dependence on western European banks implies another significant vulnerability, should circumstances force those banks to retrench. Japan still has strong trade links with the United States, and is exposed to that extent, but it seems to have avoided the build-up of private sector debt in recent years that now threatens many other countries.

It is also not clear whether, and if so to what extent, the emerging market economies might "decouple" from setbacks in the advanced industrial countries. On the one hand, their domestic demand does seem to be on an upward trend, and exports are increasingly directed to other emerging market countries. On the other hand, it is notable that much domestic investment, as well as the export of goods for final assembly in other emerging market countries, remains ultimately driven by spending in the advanced industrial countries. Moreover, financial market influences and general confidence effects would seem likely in an increasingly "globalised" environment. Such arguments imply that the linkages and vulnerabilities seen in earlier cyclical downturns have by no means been eliminated.

Rising global inflation provides a further serious and conflicting source of concern. How high could it go, and for how long? Commodity prices have been at the heart of the recent global acceleration, in part because neither demand nor supply react quickly to price changes, but the underlying pressure of strong global demand on near-term supply capacity is becoming increasingly evident over a much broader range of markets. Further, while the quiescence of wages and inflation expectations to date gives solace to some, others see a clear potential for both to rise significantly. Higher prices have already cut real consumer wages almost everywhere, even to the point of triggering social and political unrest in a number of emerging market economies. In turn, this has prompted many governments to resort to administrative measures to hold down prices and restrict exports, measures which imply that underlying inflationary forces are actually stronger than they appear. Evidently, a global economic slowdown would help reduce overall inflationary pressures. Given the inertia in the inflation process, however, this might still imply an uncomfortably long period of high inflation along with slower growth. Moreover, slower growth

would also provide an environment in which more generalised and dangerous protectionist pressures might well emerge.

Beyond these global risks to the inflation outlook, the prospects for both growth and inflation in individual regions will also be affected by exchange rate movements. One source of concern is what might happen in the markets themselves. Against the background of a still wide US current account deficit and rising external debt levels, the decline in the effective value of the US dollar has to date been remarkably orderly. However, this need not be a guide to the future. Foreign investors in US dollar assets have seen big losses measured in dollars, and still bigger ones measured in their own currency. While unlikely, indeed highly improbable for public sector investors, a sudden rush for the exits cannot be ruled out completely.

Finally, whatever exchange rate changes might occur, they could have significant costs as well as benefits. Countries like the United States, whose currencies are depreciating, should see growth benefit from trade substitution effects. The United States will further benefit from valuation effects, since most of its debts are denominated in dollars while its assets are measured in appreciating foreign currencies. Conversely, those with appreciating currencies are likely to see growth suffer on both counts.

When it comes to the impact on inflation of exchange rate changes, the calculation of costs and benefits is both more complex and, for some countries, more worrisome. For example, should the dollar and sterling continue to depreciate on an effective basis, inflationary pressures in the United States and the United Kingdom would be expected to increase. While "pass-through" from exchange rate changes has been relatively weak in these countries in recent years, this has been associated with shrinking margins in exporting countries, and enhanced efforts to keep margins up by increasing productivity relative to wage growth. However, with time, both processes become increasingly painful and the likelihood of an inflationary outcome correspondingly greater. Conversely, in most of the countries whose currencies might appreciate, particularly in Asia and western Europe, inflation is higher than desired and the disinflationary implications of an appreciation against the dollar would be clearly welcome.

In this last respect, Japan remains a significant and worrisome outlier. With the effective value of the yen close to a 30-year low, a large current account surplus and massive exchange rate reserves, the yen could eventually rise further. In this case, against a backdrop of sagging trade and continuing sluggish growth, a return to deflation could by no means be ruled out. While the Japanese economy today seems to be less exposed than many others to the various damaging interactions described above, its room for manoeuvre on the policy front has become almost non-existent. The country has a huge government debt, and policy rates are almost zero. In fact, this is the lingering heritage of Japan's long having relied almost exclusively on macroeconomic instruments to deal with the aftermath of the bubble that burst in the early 1990s.

Together with a decade or more of sub-par growth, this continuing downside exposure in Japan suggests two policy conclusions that might be

pertinent to other countries today. First, if the Japanese authorities had leaned against the bubble earlier and more vigorously than was actually done, the worst of the excesses of the “boom” might have been avoided. Second, their failure to restructure corporate and financial sector debts in a timely and orderly way made the ultimate costs of the subsequent “bust” much greater than they would otherwise have been.

### How to cope with conflicting risks?

The fundamental cause of today’s emerging problems was excessive and imprudent credit growth over a long period. This always threatened two unwelcome outcomes, although it was never clear which would emerge first. One possibility was a rise in inflation as the world economy gradually approached its near-term production potential; the second was an accumulation of debt-related imbalances in the financial and real economy which would at some point prove unsustainable and lead to a significant economic slowdown. In the event, the global economy now seems to be experiencing both unwelcome phenomena at the same time, albeit with different countries often having significantly different degrees of exposure to these common threats.

This presents a considerable complication for policymakers. Not leaning vigorously against inflation pressures, which are currently rising almost everywhere, threatens an increase in inflation expectations that might prove very costly to rein in. But not leaning vigorously against the interacting processes described above threatens a cumulative downward momentum in the economy that could all too easily get out of hand. Yet these threats also differ in their immediacy, in that inflation is actually rising, while significantly slower growth remains only a possibility in many parts of the world. In general, this should imply a bias of global policy towards being much less accommodating.

This global bias agreed, the need to evaluate conflicting risks means that monetary and fiscal policies in individual countries cannot be recommended on the basis of “one size fits all”. Each central bank must carefully assess a number of issues whose relative weight varies from country to country. First in importance is the strength of existing inflationary pressures and the risk of inflation expectations ratcheting upwards. Second, policymakers must assess the likelihood of other potential shocks to inflation going forward. Here considerations pertaining to commodity prices, exchange rates and terms of trade would loom large. Third, they must evaluate the extent to which potentially large changes in asset prices and perceptions of wealth might affect the outlook, particularly against a backdrop of elevated debt levels. And fourth, they must make a related judgment on the health of the financial system and the likelihood of a credit crunch emerging.

Given the need to make difficult judgments about all these considerations, the path of interest rates seems bound to differ across countries. While rising inflation is a clear danger everywhere, it is already a reality in most emerging market economies. There, food counts for more in the consumption basket,

the track record of price stability in some regions is less well established, and the threats to growth from balance sheet excesses and a tightening of credit standards seem generally less in evidence than in some key advanced industrial countries. Of course, if monetary policy were to be tightened relatively more in the emerging market economies, this would also imply a greater willingness to allow their exchange rates to rise in consequence. The latter is in any case to be recommended, both as an inflation-fighting tool and as an instrument for reducing global trade imbalances. Since, within the advanced industrial economies, similar considerations seem to warrant a tighter set of policies in continental Europe (relative to the United States, where the threat of recession seems greater), higher emerging market exchange rates would also help alleviate upward pressure on the euro.

Of course, policy should in principle be conducted not only with a view to resolving current problems, but also with an eye to the longer term. Again, conflicts present themselves that offer further scope for policy divergences. On the one hand, it is not impossible that the unwinding of the credit bubble could, after a temporary period of higher inflation, culminate in a deflation that might be hard to manage, all the more so given high initial nominal debt levels. Such considerations have led some, not least in the United States, to argue for a particularly vigorous use of monetary easing as “insurance” against this low-probability but high-cost outcome.

However, others, notably in continental Europe, have voiced different concerns about the future. In addition to near-term worries about higher inflation, many suspect that significantly easier monetary policies will only stimulate another unsustainable credit and asset price bubble – perhaps a partial explanation for developments in commodity markets today – and that current spending and trade imbalances will only tend to be exacerbated. Those espousing this view would note the historical experience of serial bubbles, particularly in the United States, and what seems to have been the need for an ever more vigorous monetary response to successive downturns. Another, closely related concern is that, in the end, monetary easing might even cease to stimulate real growth at all and would only produce higher prices. Indeed, many prewar theorists warned of just such a possibility. In failing to recognise this possible limitation of monetary easing, the great danger is that policymakers could delay too long in turning to other policy actions that could prove more effective in mitigating a cumulative economic downturn.

Perhaps the most obvious policy alternative would be stimulative fiscal policy. In most advanced industrial countries, slowdowns activate some degree of automatic stabilisation, though this is less common in emerging market economies. It also seems a political reality that, given the prospect of a serious downturn, discretionary fiscal policy would be used more actively. Indeed, an element of this has already been seen in the United States, where concerns about a serious downturn were used to justify a fiscal stimulus package in early 2008 that was “timely, targeted and temporary”.

At the same time, however, certain downsides must be recognised. One is that pre-emptive fiscal stimulus, like monetary easing, might encourage an upward shift in inflation expectations given an initial absence of excess

capacity. Another is that, in many countries, the explicit and implicit debts of governments are already so high as to raise doubts about whether all non-contractual commitments will be fully honoured. Further fiscal stimulus could then lead to a rise in risk premia, which might cause interest rates to back up. Moreover, for countries with large external deficits or debts, the exchange rate might also be severely affected. And, of course, the fiscal room for manoeuvre would be further restricted given fears that taxpayers' money might eventually have to be used to help resolve problems of overindebtedness in the financial or household sectors.

Principally in the United States today, but also prospectively in a number of other countries, there has been a build-up of debts that cannot be serviced on the originally agreed terms; US subprime mortgages are a good example of this. In such circumstances, creditors and debtors should in principle restructure the debt in an orderly way so as to maintain residual value to their mutual benefit, while limiting moral hazard going forward. However, one reason why governments might have to get involved in this process is that existing private sector workout and liquidation procedures, and their supporting infrastructure, could prove incapable of ensuring speedy and effective resolutions on the scale required. Moreover, new financial instruments and players in the world's major financial markets constitute a further significant impediment to private sector solutions. It is not clear where the losses are, how they should currently be valued, or how large they might grow given ongoing declines in the prices of underlying assets. Similarly, it is often not clear who retains the legal authority to initiate procedures to seize what value is presumed to remain.

Yet another complication, in sharp contrast to recurrent sovereign debt crises, is that there are now millions of troubled borrowers, particularly US households, as well as a myriad of lenders. And equally troubling, given the widespread use of credit risk transfer instruments, is that the interests of investors are no longer aligned in seeking to minimise losses by avoiding bankruptcies. In sum, orderly private sector workouts are not going to be so easy. Perhaps the most useful role of governments might be to see how this state of affairs could be quickly improved.

Should governments feel it necessary to take direct actions to alleviate debt burdens, it is crucial that they understand one thing beforehand. If asset prices are unrealistically high, they must eventually fall. If saving rates are unrealistically low, they must rise. And if debts cannot be serviced, they must be written off. Trying to deny this through the use of gimmicks and palliatives will only make things worse in the end. Against this background, it seems worthwhile to lay out some principles, based on the handling of previous crises in Japan, Sweden and elsewhere, while recognising at the same time that turning principles into practice raises its own set of difficult problems.

First, in principle, the government's actions should be quick and decisive, with the clear objective of removing all uncertainty about future private sector losses. This happened in the Swedish banking crisis of the early 1990s, whereas in Japan the government took too long to act decisively. In practice, however, it will always take some time to determine the severity of the problem

to be faced and to decide what to do about it. Second, in principle, losses should fall heavily on those who incurred them in the beginning: first the borrowers and then those who lent unwisely to them. In practice, however, the possible implications of widespread household bankruptcies (including resulting litigation) would also have to be seriously considered. Third, if the public sector chooses to socialise the losses, it should be done explicitly and transparently, without shifting potential losses onto the balance sheets of central banks. In practice, however, as was seen in Japan in the early 1990s, inadequate legislation pertaining to deposit insurance gave the central bank very little alternative to providing emergency assistance to insolvent institutions. And fourth, the moral hazard associated with the use of government money should be counterbalanced by the introduction of forward-looking measures to prevent similar problems arising in the future. The practical problems this raises are discussed in the next section.

Most of the more specific suggestions for government involvement have been directed to alleviating the likelihood of a full-blown credit crunch in global financial markets. What is sought are ways to mute the potentially powerful interaction between uncertainty about the solvency of borrowers, primarily households, and the solvency of lenders. In fact, steps have already been taken in the United States to use government and quasi-government agencies to support mortgage markets, and thus indirectly house prices, homeowners and lenders as well. In a number of countries, there have been calls for direct government purchases to put a floor under the prices of a variety of financial instruments. Of course, this conflicts directly with the need for the market to find its own level if it is eventually to function normally again, and exposes the government to future losses should prices continue to fall regardless. Another approach to the problem focuses not on households' assets but on their liabilities, and suggests that there should be a form of blanket reduction based on certain principles established by governments. The downsides of course are evident: the potential direct cost to the government, the moral hazard involved, and the political outrage as "prudent" borrowers and taxpayers are forced to subsidise the "imprudent".

How might governments help in reducing uncertainties about the solvency of banks and, in turn, the threat of a credit crunch? Evidently, the first step would be to encourage self-help. Both dividends and bonuses should be cut in order to increase capital cushions. The private sector, whether through rights issues or appeals to outside investors, should also be turned to for further capital injections. This process would clearly be facilitated by greater clarity as to the need for capital, in the light of prospective losses and also possible involuntary increases in balance sheets. The problem, however, is that the valuation of many structured products is difficult, because there is effectively no market for them, and valuing them using models has many drawbacks. The suggestion that banks might agree on a common "template" for valuations, recognising these shortcomings, nevertheless has significant merit.

Of course, such an evaluation might also reveal that the losses are uncomfortably large, a possibility for which the authorities should make preparations in advance. One response, if the regulatory authorities were able

to determine that the estimated “fair value” losses were much greater than seemed likely to be realised in the end, might be a temporary degree of regulatory forbearance. Conversely, and perhaps more likely, if the regulators felt unable to do this, then the government should not hesitate to intervene directly subject to the principles laid out above. Mergers, takeovers, the establishment of a “bad bank” to house bad assets, recapitalisation using public funds and even nationalisation are all procedures that should be contemplated depending on the circumstances.

When direct public sector intervention seems required, the domestic legal framework and the potential need to involve foreign authorities will be important factors constraining what might in practical terms be done. In such circumstances, it is likely to become evident quite quickly that not enough effort has been put into preparing for the possibility of a financial crisis of some sort. If the authorities must muddle through regardless, the experience will at least provide some indications of what preparations might have been better made in advance.

### Improving crisis prevention and crisis management

To be realistic, there have been financial crises with significant economic costs since time immemorial, and we should not think they can ever be eliminated. Nevertheless, steps can be taken in advance both to mitigate the excesses in the expansionary phase of the credit cycle and to further reduce the costs in the downturn through better crisis management. With the costs of the current turn in the credit cycle becoming increasingly apparent, there should be a corresponding political will to proceed with such improvements. Moreover, a commitment to do so would help reduce the moral hazard likely to arise from direct government involvement, both actual and potential, in response to the current difficulties.

As noted in the Introduction to this Annual Report, the roots of the present turmoil are both different from and similar to earlier such occurrences. A number of study groups have already identified “what is different” in financial markets today and have made many sensible suggestions for changes that would reduce the dangers these factors now evidently pose. At the same time, and again sensibly, these suggestions also seek to maintain wherever possible the benefits these new developments offer. Not least, ways must be found to turn the theoretical benefits offered by the originate-to-distribute model into a practical reality.

What has received less attention are potential cures for “what is the same” in the current turmoil: the inherent procyclicality of the financial system and excessive credit growth. This lack of attention is surprising for two reasons. First, recognising excessive credit growth as the underlying problem helps explain not only the current financial turbulence, but imbalances in the real economy and rising inflation as well. This is truly parsimonious. Second, it could well be that the tendency for rapid credit expansion to have dangerous side effects is actually growing. The trends towards globalisation and consolidation, as well as securitisation, increase not only the likelihood of

excessive behaviour in the upturn but, arguably, the costs of downturns as well.

In the light of all this, what seems needed is a new macrofinancial stability framework to resist actively the inherent procyclicality of the financial system. By using macroprudential regulatory instruments as well as monetary tightening to lean against the upturn, the worst excesses could be avoided. Indeed, faced with the anticipation of resistance from the official sector, private sector behaviour might itself be tempered. Note, for example, how the new focus of central banks on inflation is said to have affected the inflation expectations process. And fewer excesses on the way up would probably imply less damage to clean up afterwards, as well as more room to ease policy since this would have been tightened more systematically beforehand.

The first salient feature of such a framework would be a primary focus on systemic issues. Attention would be placed on the dangers associated with many institutions having similar exposures to common shocks, for example a turn in the property cycle. This would be complemented by the recognition of endogenous interactions among and between institutions and markets that could lead to highly non-linear outcomes. While such an approach would not imply paying less attention to the good health of individual institutions, it would certainly imply significantly enhanced oversight of firms that were very large or had complex relations with other parts of the system.

The second feature would be a much more “symmetrical” or countercyclical use of policy instruments. They would be tightened in the expansionary phase of the credit cycle and eased in the downturn. In this regard, the new framework would simply mirror what is now the accepted wisdom for fiscal policy: namely, that the good times should be used to prepare for the bad. Currently, in an upturn, neither monetary nor regulatory instruments tend to respond systematically to emerging imbalances of the sort described above. Moreover, regulatory instruments are commonly tightened only when things turn bad, potentially making the downturn worse.

To be more specific, monetary policy might be tightened even with projected inflation under control, given a sufficiently worrisome combination of rapid credit growth, rising asset prices and distorted spending or production patterns. In focusing on a combination of systemic indicators, this proposal is quite different from simply targeting asset prices. Macroprudential instruments would be used with a similar bias, either on a discretionary basis or following some rule-based criteria, to ensure that risk spreads, loan loss provisions and capital provisions all moved so as to reduce the amplitude of the credit cycle. A technical challenge would be ensuring that the regulatory requirements for individual institutions reflected their own behaviour, while at the same time responding to system-wide developments. Fortunately, the flexibility provided by the various pillars of Basel II eases the task of finding a solution.

A third feature would be still closer cooperation between the central banking and regulatory communities in trying to identify the build-up of systemic risks and in deciding what to do to mitigate them. What is needed is a means of better integrating the particular insights of each community and their respective analytical strengths. Increased clarity about the individual

responsibilities of cooperating agencies, and formal agreements to ensure that timely decisions are taken when needed to foster systemic stability, would also be of great practical usefulness.

There are many practical impediments to making a macrofinancial framework operational. The first is that not everyone accepts the hypothesis that excessive credit growth is the root of the problem. Nor is everyone agreed that it might prove difficult to clean up the mess after such periods of excess. While hopefully it will not come to that, if the costs of the current turmoil continue to mount and policy measures prove largely ineffective, such beliefs are more likely to be re-evaluated. A second problem is the practical one of recognising when resistance to the upswing becomes necessary. And a third problem is mustering the will to act, to take away the punch bowl at the party, when the time is right. These problems are real but they should not be insurmountable, and they pale against the difficulties likely to be encountered when an unresisted boom turns to bust.

A framework designed to reduce the amplitude of credit-driven cycles will not eliminate them. Periods of turmoil and outright crisis will then still have to be faced and managed, and such events should also be prepared for through the introduction of a coherent set of “safety net” measures. The adequacy of deposit insurance schemes should be evaluated and shortcomings dealt with. “Off-the-shelf banks” should be set up to allow crucial functions of bankrupt banks to be maintained. Legislation should be enacted to give the authorities the powers they need to cope with unfolding difficulties. Memoranda of understanding, both domestic and international, need to be agreed. And war games need to be played by those who would actually manage problems in real time. Admittedly, there is an element of moral hazard in all efforts of this sort. But if history is any guide, failing to make such efforts will eventually entail recourse to still more expensive and dangerous measures during the crisis itself. Businesses and banks are expected to undertake business continuity planning in advance of trouble. Surely we should expect as much from policymakers.



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# Organisation, governance and activities

This chapter provides an overview of the internal organisation and governance of the Bank for International Settlements (BIS). It also reviews the activities of the Bank, and of the international groups it hosts, over the past financial year. These activities focus on promoting cooperation among central banks and other financial authorities, and on providing financial services to central bank customers.

## Organisation and governance of the Bank

### *The Bank, its management and shareholders*

The BIS fosters international monetary and financial cooperation and serves as a bank for central banks. Its head office is in Basel, Switzerland, and it has two representative offices, one in the Hong Kong Special Administrative Region of the People's Republic of China and one in Mexico City. The Bank currently employs 578 staff from 48 countries.

The BIS fulfils its mandate by acting as:

- a forum to promote discussion and facilitate decision-making among central banks and to support dialogue with other authorities that have responsibility for promoting financial stability;
- a centre for research on policy issues confronting central banks and financial system supervisory authorities;
- a prime counterparty for central banks in their financial transactions; and
- an agent or trustee in connection with international financial operations.

The Bank also hosts the secretariats of a number of committees and organisations that seek to promote financial stability:

- The Basel Committee on Banking Supervision, the Committee on the Global Financial System, the Committee on Payment and Settlement Systems and the Markets Committee were established by the Governors of the G10 central banks during the past 40 years. They enjoy a significant degree of autonomy in setting their agendas and structuring their activities.
- The Financial Stability Forum, the International Association of Insurance Supervisors and the International Association of Deposit Insurers are independent organisations whose secretariats are also hosted by the BIS, but which do not report directly to the BIS or its member central banks.
- The Irving Fisher Committee on Central Bank Statistics is governed by the international central banking community and operates under the auspices of the BIS.

Details of the role and recent activities of these committees and organisations are provided below.

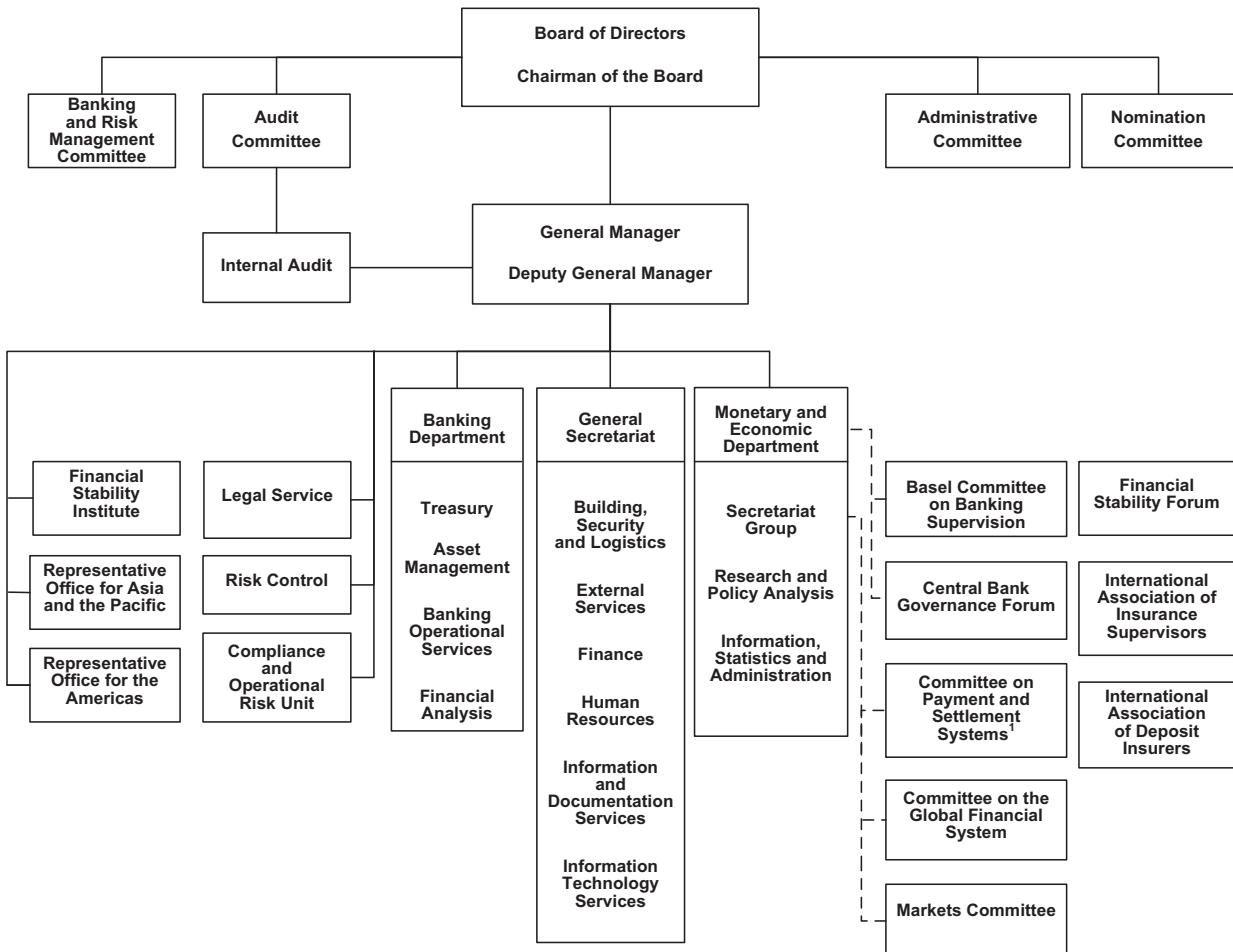
The Bank has three main departments: the Monetary and Economic Department, the Banking Department and the General Secretariat. These are supplemented by: the Legal Service; the Compliance and Operational Risk Unit, Internal Audit and Risk Control; and the Financial Stability Institute, which fosters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

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

- The General Meeting of member central banks. Fifty-five central banks or monetary authorities currently have rights of voting and representation at General Meetings. The Annual General Meeting is held within four months of the end of the Bank's financial year, 31 March. In 2007, 110 central banks took part, including 78 at Governor level. Delegates from 17 international institutions also attended.
- The Board of Directors, currently comprising 20 members. Its main responsibilities include determining the strategic and policy direction of the Bank and supervising the Bank's Management. The Board is assisted by the Administrative Committee, the Audit Committee, the Banking and Risk Management Committee and the Nomination Committee. These committees are composed of selected Directors.
- The General Manager, who is responsible to the Board of Directors for the conduct of all important matters affecting the BIS as a whole. In taking decisions on these matters, the General Manager is advised by the Executive Committee of the Bank. The Executive Committee is chaired by the General Manager and comprises in addition the Deputy General Manager, the Heads of Department and other officers of similar rank appointed by the Board.

Member central banks, Directors and senior officials, and recent changes in the composition of the Board and Management are listed at the end of this chapter.

## Organisation of the BIS as of 31 March 2008



<sup>1</sup> The CPSS secretariat also handles the secretariat functions for the Central Bank Counterfeit Deterrence Group.

## Changes in the governance of the Bank

### Advisory committees to the Board

With a view to further improving its governance practices, the Board completed in 2007 a review of the structure, mandate and composition of existing BIS Board committees. It decided to establish additional Board committees to ensure a broader participation of Board members in the preparation of Board decisions.

The new structure for BIS Board committees, which came into effect in July 2007, comprises, in addition to the Administrative Committee (formerly the Consultative Committee) and the Audit Committee, two new committees:

- a Banking and Risk Management Committee, the purpose of which is to provide a forum for the preparation of banking and risk management matters to be considered and/or decided upon by the Board; and

- a Nomination Committee, which assists the Board in carrying out its responsibilities as the appointing authority for positions on the Executive Committee of the BIS.

Furthermore, in November 2007, the Board decided to establish a Consultative Council for the Americas (CCA) as an advisory committee to the Board, comprising the Governors of BIS member central banks in the Americas. Reflecting the key role that is being played by the BIS Asian Consultative Council in guiding the activities of the BIS in Asia and the Pacific, the CCA's purpose will be 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.

## 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 economic and financial 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 2007 BIS bimonthly meetings took place in Cape Town and were hosted by the South African Reserve Bank. On that occasion, a special roundtable meeting of African Governors was organised to discuss the macroeconomic performance of African countries and the challenges they face in developing their financial markets.

The bimonthly meetings comprise, in particular, the Global Economy Meeting and the All Governors' Meeting. The Global Economy Meeting brings to the discussion table more than 30 Governors of key industrial and emerging market economies. This group 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 2007/08, the topics discussed were:

- the underlying causes and potential economic consequences of the current financial turmoil;
- the role of monetary and credit aggregates in monetary policy;
- the purpose and design of sovereign wealth funds and the related role of central banks; and
- the role of central banks in financial system development. On the occasion of this discussion, Professor Amartya Sen, the laureate of the 1998 Nobel Memorial Prize in Economics, was invited to the BIS to present his views on the role of central banks in democratic societies.

Because not all BIS member central banks are directly involved in the work of the Basel-based committees and other organisations hosted by the Bank, the All Governors' Meeting also represents an opportunity to review the activities of these specialised groupings. In 2007/08, for example, Governors discussed the work of the Basel Committee on Banking Supervision in the light of recent financial market developments.

Other regular meetings that take place during the bimonthly gatherings are the meetings of Governors of the G10 countries and those 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 attach importance to their dialogue with the heads of supervisory agencies, other financial authorities and senior executives from the private financial sector. The Bank regularly organises informal discussions among public and private sector representatives that focus on their shared interests in promoting and maintaining a sound and well functioning international financial system. In addition, the Bank organises various other meetings, on a regular or an ad hoc basis, for senior central bank officials. In a number of these meetings, representatives of 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 "Capital flows and financial assets in emerging markets: determinants, consequences and challenges for central banks".

### *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 deepened its relationship with Asian regional shareholders by organising joint high-level meetings with four member central banks and collaborating in research, drawing on the resources of the Asian research programme.

Meetings were held with:

- the Central Bank of Malaysia, on the implications of financial market development for monetary policy;
- the Reserve Bank of India, on money market development;
- the Bangko Sentral ng Pilipinas, on transparency and communication in monetary policy; and
- the Bank of Korea, on the policy challenge posed by household debt developments.

The Asian Office also convened meetings of reserve managers, monetary policy operators, central bank auditors and legal experts from within and outside the region. Asian Office economists provided secretariat services to twice-yearly meetings of the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP) Forum on Foreign Exchange Markets.

In parallel, the representative of the Financial Stability Institute in the Asian Office provided secretariat services to the EMEAP Working Group on Banking Supervision meeting on financial stability and regulatory capital. Asian Office economists also wrote a background note for the first meeting of the deputy governor-level Monetary and Financial Stability Committee of EMEAP.

#### *Banking activity and the Asian Bond Funds*

The dealing room of the Asian Office further extended the range of banking services it offers to regional customers. An increasing number of Asian central banks are now dealing in a diverse range of products with the BIS Regional Treasury. In addition, the dealing room stepped up investment in the region through increased placements with existing counterparties and some new outlets, while maintaining a conservative risk profile.

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 have provided seed money from their international reserves for funds invested in sovereign and quasi-sovereign bonds from eight EMEAP economies. The overall size of the funds that the ABF2 invests in reached \$3.3 billion at the end of March 2008, with \$765 million of private investment in the funds, in addition to central bank holdings, which have grown from \$2 billion to \$2.5 billion. After its public launch as an open-ended fund in Indonesia in March 2007, the ABF Indonesia Bond Index Fund was successfully listed in December as the first Exchange Traded Fund on the Jakarta Stock Exchange. The Pan Asia Bond Index Fund returned almost 29% in its first 33 months of operation, to the end of March 2008. This return clearly outpaced that of US Treasury or agency debt of similar duration.

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

The Asian Consultative Council (ACC), currently chaired by Y V Reddy, Governor of the Reserve Bank of India, offers Governors of shareholding central banks in Asia and the Pacific a means of communication with the BIS Board and Management. At its 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). In giving the BIS Board and Management the benefit of their views on these matters, Governors helped to attach priority where needed and to avoid duplication of efforts.

In February, the BIS once again organised a Special Governors' Meeting, this time hosted by the Reserve Bank of India in Mumbai, bringing together Governors from Asia-Pacific and elsewhere. Governors discussed supervisory lessons of the recent financial turmoil, the economic outlook and the development of robust money markets.

#### *Asian research programme*

The three-year Asian research programme passed its midpoint in early 2008. Progress is being made on a series of research projects that are intended to help regional authorities to improve monetary policy and operations, to develop financial markets, to maintain financial stability and to strengthen prudential policy. Research fellows from five shareholder central banks visited the Asian Office to participate in collaborative research. 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 a number of universities and research institutes in the region. This research has not only fed into the numerous meetings organised with regional central banks, but has also led to several publications in refereed journals as well as 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, including one on policy responses to capital flows in the region and another on new instruments and structured vehicles in regional credit markets. Two Asian research networks organised under the research programme held their first annual workshops in January.

#### *The Americas*

BIS initiatives in the Americas focused not only on shareholder central banks, but also on additional contacts with and events that included non-shareholding central banks, regulatory authorities and the academic community. These resulted in several articles in various journals, as well as in the Bank's *Quarterly Review* and the *BIS Papers* series.

Noteworthy Americas Office activities included:

- a first conference on new financing trends in Latin America, organised together with the Federal Reserve Bank of Atlanta and held in Mexico City; and
- a meeting for regional central banks on capital flows, held in Uruguay.

Furthermore, the Office hosted the first meeting of the Central Bank Governance Network to be held in the Americas and a meeting of the Management Committee of the Central Bank Counterfeit Deterrence Group; convened meetings for reserve managers from within and outside the region, and for central bank risk managers; and supported regional Financial Stability Institute events.

The Americas Office also provided support for and contributed to outreach meetings hosted by regional central banks, such as the Working Party on Markets in Latin America with the Markets Committee, held in Brazil; a meeting on housing finance with the Committee on the Global Financial System in Chile; and the BIS Working Party on Monetary Policy in Latin America held in Mexico.

As mentioned above, the Board decided in November 2007 to establish a Consultative Council for the Americas. The CCA will be formally constituted in 2008. The Americas Office will provide secretariat services for CCA meetings, which will be held at least once a year.

### *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 two-pronged programme designed to disseminate standards and sound practices primarily to the banking and insurance supervision sectors.

#### *Meetings, seminars and conferences*

The first prong of the FSI programme is the long-standing series of high-level meetings, seminars and conferences both in Basel and at venues around the world. In 2007, the FSI organised a total of 55 events on a broad range of financial sector topics. More than 1,900 representatives of central banks and banking and insurance supervisory authorities participated. The FSI continued its series of high-level meetings for Deputy Governors and heads of supervisory authorities, with such meetings taking place in Africa, Asia, Europe and the Middle East. These meetings focused on Basel II implementation and other key supervisory issues.

#### *FSI Connect*

The second prong of the FSI programme is FSI Connect, an online information resource and learning tool for financial sector supervisors. FSI Connect includes more than 140 tutorials covering a wide range of topics for supervisors at all levels of experience and expertise. In the past year, a number of tutorials were added in two new subject areas: accounting, and payment and settlement systems. More than 150 central banks and supervisory authorities subscribe to FSI Connect, representing approximately 8,000 users.

#### *Other major initiatives*

In 2007, the FSI published the results of a survey on institutional arrangements for financial sector supervision in an Occasional Paper. The paper highlighted recent trends in supervision and set out the key players involved in financial sector supervision and the monitoring of overall financial stability. The paper also addressed issues related to cross-sectoral and cross-border supervisory cooperation.

Promotion of financial stability through 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 market turmoil*

Prior to the financial market turmoil that began in mid-2007, the Basel Committee had initiated work streams on a variety of risk management and supervisory topics, including liquidity risk and bank valuation practices. Given the weaknesses revealed by the turmoil, the Basel Committee accelerated and in some cases modified its work plans. The turmoil also taught important lessons that have helped guide the Committee in further strengthening the Basel II Framework. These initiatives are a core element of global efforts to strengthen the resilience of the banking system.

#### *Liquidity risk management and supervision*

The Basel Committee's work on liquidity risk that began in late 2006 focused initially on supervision practices in member countries. In response to market events, the original mandate was expanded to focus on the strengths and weaknesses of liquidity risk management in times of difficulty and, in February 2008, the Committee published *Liquidity risk: management and supervisory challenges*. The document highlighted financial market developments that affect liquidity risk management, discussed national supervisory regimes, and outlined observations from the current period of stress and potential future work related to liquidity risk management and supervision. The Committee is now completing a fundamental review of its *Sound practices for managing liquidity in banking organisations*, the global standards for liquidity risk management and supervision, which were issued in 2000. It plans to issue the new standards in mid-2008.

#### *Bank valuation practices*

In early 2007, the Basel Committee began a review of bank valuation practices. The objective was to gain a deeper understanding of approaches used to determine model-based valuations of financial instruments used for risk management and financial reporting purposes. This initiative also reviewed the related control, audit and governance practices surrounding these valuations. In response to the market turmoil, the scope of the work was expanded to include coverage of how banks responded to the market stress and initial lessons learned. While current valuation practices and processes were not the

underlying cause of the market turmoil, the Basel Committee concluded that challenges in this area had contributed to and amplified its effects. The Committee will develop guidance for supervisors to assess the rigour of banks' valuation processes and thereby promote improvements in risk management.

#### *The Basel II Framework*

The financial market turmoil has reaffirmed the importance of prompt implementation of Basel II as a means to improve risk management and bank supervision. In response to market events, the Basel Committee undertook a review of the Basel II Framework to identify areas that could be strengthened in each of the Framework's three pillars: minimum capital requirements (Pillar 1), the supervisory review process (Pillar 2) and market discipline (Pillar 3). One such area is the strengthening of the capital requirements for the trading book. In October 2007, the Basel Committee published a consultative document covering *Guidelines for computing capital for incremental default risk in the trading book*. The Committee now wants to extend the scope of the proposed guidelines to include other potential event risks in the trading book. It expects to issue its event risk proposal for public consultation in 2008.

The market turmoil has also highlighted the importance of effective and consistent cross-border implementation of Basel II. In this context, in November 2007 the Committee published *Principles for home-host supervisory cooperation and allocation mechanisms in the context of advanced measurement approaches (AMA)* for operational risk. In addition, the Committee's Accord Implementation Group continues to address practical implementation challenges faced by the global supervisory community and to promote consistency in the implementation of Basel II.

#### *Other risk management and supervisory initiatives*

The Basel Committee has continued to play an active role in the work to develop international accounting and auditing standards. In this regard, it has worked closely with the International Accounting Standards Board (IASB) and the International Auditing and Assurance Standards Board (IAASB). As the use of fair value estimates in financial statements has increased, the Committee has been keen to ensure that these estimates are reliable, relevant and auditable. In addition to its work on accounting standards related to financial instruments, the Committee is also focusing on issues related to the development of a common conceptual framework and the review of key audit issues from a banking supervision perspective.

In 2007, the Basel Committee formed a working group to review issues relating to the resolution of large banks with cross-border operations. This reflects the increasing significance of cross-border banking activities in recent years. The group will analyse existing resolution policies, allocation of responsibilities and legal frameworks as a foundation to a better understanding of the potential impediments and possible improvements to cooperation in the resolution of cross-border banks.

The Basel Committee also continues to play an important role in efforts to combat money laundering and the financing of terrorism. In its October

2007 newsletter, the Committee encouraged participants from the private and official sector to enhance transparency in international payments to aid anti-crime efforts worldwide. It continues to review the supervisory issues related to "cover payments" in order to reach a consensus on principles informing supervisory policies and priorities for the implementation of the transparency rules for international payments.

#### *Outreach*

The Basel Committee continues to expand the scope of its work to include supervisors from non-member jurisdictions and to further enhance its dialogue with supervisors around the world. In addition to the 13 countries represented on the Committee, more than 20 other countries participate directly in a variety of subgroups. This has served to increase the information exchange among a large number of countries. It has also proven to be an efficient way for the Committee to gain input from regions such as Asia and Latin America, as well as to disseminate information to members of regional groups of bank supervisors. The Committee's International Liaison Group (ILG) provides an additional platform for non-member countries to contribute to new Basel Committee initiatives and to develop proposals. The Committee will continue to explore ways to expand its dialogue with non-member countries through the work of the ILG, meetings with regional groups of banking supervisors and the biennial International Conference of Banking Supervisors, as well as other mechanisms.

#### *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 Committee, whose members are the G10 central banks and the Central Bank of Luxembourg, regularly invites representatives from the central banks or monetary authorities of Australia, Brazil, China, Hong Kong SAR, India, Korea, Mexico, Singapore and Spain to join its discussions.

During the past year, the Committee's agenda increasingly reflected the unfolding financial market turmoil. In the context of its regular monitoring of the global financial system, the CGFS discussed:

- the causes of the broad-based credit deterioration in structured finance and the spillovers to other segments of the financial system;
- the effects of the recent turmoil on banks' balance sheets, their exposures to the credit market turmoil, including through warehouse risk, and exposures to off-balance sheet vehicles such as structured investment vehicles and conduits;
- the capacity of banks to raise short-term funding and capital against the background of continued disruptions in money and capital markets; and
- the consequences of the rapid deterioration in credit markets and the possible broader economic impact of tighter credit conditions.

In addition, the Committee established study groups to review specific aspects of the recent market turmoil. One group was asked to investigate how investors used rating information on structured finance products. This topic was also discussed at a CGFS workshop with credit rating agencies and investors in London. A second study group was asked to examine, in coordination with the Markets Committee, the effectiveness of central banks' responses to the tensions in money markets. The CGFS working group on private equity and leveraged finance, which was established before the turmoil began, also shifted its focus to the potential financial stability implications of the rapid growth of leveraged finance markets in the light of the recent turmoil.

As part of its efforts to improve the understanding of structural developments in global financial markets, the Committee established a working group to examine the financial implications of the significant rise in capital flows to emerging market economies in recent years.

Furthermore, the Committee organised several special meetings, including a series of regional meetings on housing finance following the publication in 2006 of its working group report on housing finance in the global financial system, and a roundtable on the development of local currency bond markets in Africa.

### *Committee on Payment and Settlement Systems*

The Committee on Payment and Settlement Systems (CPSS), chaired by Timothy F Geithner, 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.

In July 2007, the Committee issued a consultative report entitled *Progress in reducing foreign exchange settlement risk*. The report is based on a major survey of how banks and other financial institutions manage the risks they can incur when settling foreign exchange trades. It concludes that although much progress has been made in tackling the problem, evidenced most visibly by the establishment and growth of CLS Bank, a notable share of trades is still settled in ways that generate significant potential risk in the financial system. The report therefore recommends specific actions by individual institutions, industry groups and central banks to reduce and control remaining large and long-lasting exposures. As a follow-up to the report, the Committee will be discussing with the Basel Committee possible ways to ensure that banks apply appropriate risk management procedures to their foreign exchange settlement exposures.

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.

## *Markets Committee*

The Markets Committee, chaired by Hiroshi Nakaso, Director General of the Financial Markets Department of the Bank of Japan, serves as a forum for central banks to discuss the specifics of their market operations. The Committee brings together senior officials responsible for market operations at G10 central banks. Representatives from the central banks or monetary authorities of Australia, Brazil, China, Hong Kong SAR, India, Korea, Mexico, Singapore and Spain also participate regularly.

At their bimonthly meetings, and whenever it is deemed useful, participating central banks (or a subset of them) jointly review recent developments in financial markets and their short-run implications for the functioning of these markets and their own operations.

Issues covered in this year's regular meetings included:

- the impact of monetary policy decisions on markets and possible communication challenges;
- the factors behind market tensions, in particular in money markets, and the nature and effects of central bank actions to address them;
- the consequences for currencies of sudden shifts in carry trade strategies; and
- the short-term patterns in global capital flows.

In addition, the Committee held special meetings, sometimes with the private sector, to address topics of a more structural nature, such as central bank understanding and monitoring of hedge fund strategies, changes in commodity markets, and the growing role of sovereign funds in global capital markets. The Committee organised, in cooperation with the Americas Office, a working party on markets in Latin America that was hosted by the Central Bank of Brazil.

As a result of the tensions observed in money markets, the Committee felt the need for more frequent and detailed discussions about market developments and the technical aspects of central bank market operations. To enhance market transparency and the understanding of central bank actions, the Committee also publicly released, for the first time, information on the monetary policy frameworks and market operations of its members in the form of a compendium. Finally, the Committee was involved in a study group with the CGFS to examine the effectiveness of central banks' responses to the tensions in money markets.

## *Central Bank Counterfeit Deterrence Group*

The Central Bank Counterfeit Deterrence Group (CBCDG) is mandated by the Governors of the G10 central banks to investigate threats to the security of banknotes and to propose 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 BIS 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. At their annual meeting, the G10 Ministers and Governors reviewed progress made in implementing the recommendations of the FSF's *Report on highly leveraged institutions*. They welcomed the progress made both in the joint supervisory review of the counterparty risk management practices of the core intermediaries and in the work by private sector working groups in the United Kingdom and the United States to develop best practices for hedge funds in order to strengthen market discipline. The G10 Ministers and Governors also endorsed the renewal of the General Arrangements to Borrow for a further five-year period.

### *Financial Stability Forum*

The Financial Stability Forum (FSF) was established at the BIS in 1999 by G7 Finance Ministers and central bank Governors to promote international financial stability through enhanced information exchange and cooperation in financial supervision and surveillance. Its remit is to assess risks and vulnerabilities affecting the international financial system and to encourage and coordinate action to address them. The FSF comprises senior officials from finance ministries, central banks and financial regulators in key financial centres, as well as representatives of international financial institutions (the BIS, IMF, OECD and World Bank), international supervisory and regulatory standard-setting bodies (the Basel Committee, the IAIS, the IASB and the International Organization of Securities Commissions (IOSCO)) and central bank expert groupings (CGFS and CPSS). The FSF is chaired by Mario Draghi, Governor of the Bank of Italy.

The FSF normally meets twice yearly in plenary form, most recently in September 2007 in New York and March 2008 in Rome. At these meetings, members discussed the current challenges and vulnerabilities in financial markets, the steps that are being taken to address them and policy options going forward. The Forum also holds occasional regional meetings to foster wider exchanges of views on financial vulnerabilities and relevant policy work under way.

In May 2007, the FSF issued an update of its report on highly leveraged institutions. While the hedge fund sector has not been the primary source of the recent market turmoil, the severity of market problems has highlighted the importance of ensuring sound counterparty risk management at regulated institutions and fostering the exchange of relevant information between hedge funds and their counterparties. The updated report examined important issues in these areas and made a series of recommendations. The FSF subsequently welcomed private sector initiatives to enhance guidance on sound practices for hedge fund managers and investors. At its Rome meeting,

the FSF said that it would welcome regular reports on the adoption of the standards by the hedge fund industry and on how well these standards are meeting the objectives of increasing transparency and improving risk management practices.

At its September 2007 meeting, the FSF reviewed its offshore financial centres (OFC) initiative, based on a report from its OFC Review Group. The Forum acknowledged the significant progress made by OFCs, although some concerns remain. The FSF restated its commitment to foster compliance with international standards, including better cooperation and information exchange.

At the request of the G7 Finance Ministers and central bank Governors, the FSF prepared a report identifying the key weaknesses underlying the market turmoil that started in the summer of 2007 and recommending actions to address these weaknesses. The *Report of the Financial Stability Forum on enhancing market and institutional resilience*, published in April 2008, was prepared by a working group comprising senior officials from major financial centres and international financial institutions and the chairs of international supervisory and regulatory bodies. It sets out specific policy recommendations in the following areas: prudential oversight of capital, liquidity and risk management; transparency, disclosure and valuation practices; the role and uses of credit ratings; and the authorities' responsiveness to risks and their arrangements to deal with stress in the financial system. These recommendations are concrete and operational and the FSF will oversee their timely implementation.

The FSF has continued its support of efforts to strengthen international accounting and auditing standards and practices. In its report to the G7, the FSF called on accounting standard setters to enhance the financial reporting standards for off-balance sheet vehicles, valuations and risk disclosures, while auditing standard setters and oversight authorities were encouraged to improve their guidance about auditing valuations of complex or illiquid financial products.

At their April 2008 meeting in Washington, the G7 Ministers and Governors strongly endorsed the report and identified a number of recommendations among the priorities for prompt implementation. These include initiatives on disclosure and accounting standards, as well as work to strengthen risk management practices and capital positions, issue liquidity risk management guidelines, and revise codes of conduct for credit rating agencies.

FSF website: [www.fsforum.org](http://www.fsforum.org).

### *International Association of Insurance Supervisors*

The International Association of Insurance Supervisors (IAIS), hosted by the BIS since 1998, 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. In collaboration with other international regulatory bodies, such as its Joint Forum partners, the Basel Committee and IOSCO, the IAIS has helped develop principles for the supervision of financial conglomerates. Over recent years, the IAIS has grown significantly.

The IAIS actively participates in the FSF and has contributed to the activities of the FSF Working Group on Market and Institutional Resilience. During the year, the IAIS conducted three surveys to assess the potential impact of global financial market developments on the insurance sector. The findings will assist in identifying and prioritising its activities and will provide input to the FSF's work from an insurance regulatory perspective.

During the past year, the IAIS took major steps in the following areas.

#### *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 2007, the IAIS provided substantial input to the IASB's work on insurance contracts, and on other projects of relevance to insurers, such as fair value measurements. The IAIS also comments on the International Federation of Accountants' consultative draft papers on the international auditing standards of most relevance to the insurance sector.

#### *Capital adequacy and solvency*

In October 2007, the IAIS adopted three guidance papers on solvency assessment. Aimed at facilitating greater comparability and convergence in the international assessment of insurer solvency, these papers focus on:

- principles-based requirements for a solvency regime in relation to regulatory capital requirements;
- 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 substantial progress in developing a set of principles to facilitate more streamlined and efficient supervision of insurance groups. Supplementary standards and guidance papers will support this work.

#### *Reinsurance*

In November 2007, the IAIS published the fourth edition of its *Global reinsurance market report*, based on global reinsurance statistics submitted by the world's largest reinsurers. It shows that 2006 was significantly more profitable for reinsurers than 2005, which had seen record losses.

#### *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. In January 2008, the IAIS rolled out IAIS DISCOVER, a series of online tutorials complemented by workshops and distance learning events. Launched in Beijing, three tutorials were piloted with Asian insurance supervisors. The IAIS will develop additional tutorials based on the Core Curriculum for Insurance Supervisors developed in cooperation with the World Bank.

IAIS website: [www.iaisweb.org](http://www.iaisweb.org).

#### *International Association of Deposit Insurers*

The International Association of Deposit Insurers (IADI), hosted by the BIS since 2002, 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, development and educational programmes; and
- provides advice on the establishment or enhancement of effective deposit insurance systems.

Currently, 73 organisations (of which 51 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 March 2008, IADI released *Core Principles for effective deposit insurance systems* for the benefit of countries considering the adoption or reform of a deposit insurance system. The 21 Core Principles are based on IADI research and guidance papers and the endorsement by IADI of guidance developed by its founding members and international organisations. In developing them, IADI drew heavily on the experience of its members. The Core Principles are designed to be adaptable to a broad range of country circumstances, settings and structures.

During its sixth year of operation, IADI continued to provide many forums for deposit insurers and other safety net participants. Highlights were:

- the Sixth Annual Conference, themed "Deposit insurance and consumer protection", attended by 250 deposit insurers and policymakers from

- 52 countries with an exposition on key characteristics of depositor protection arrangements from systems around the world, held in Kuala Lumpur in October 2007;
- an IADI Executive Training Program, held in Washington in July 2007, featuring case studies on the establishment of deposit insurance systems, and the management of depositor claims against a failed bank;
- a symposium on cross-border issues, held in Basel in May 2007; and
- an interregional conference on “The role of deposit insurance systems in enhancing financial stability” in Istanbul in June 2007.

Recent regional activities have included conferences, seminars and committee meetings in Istanbul, Prague, Washington DC, Kuala Lumpur, San Salvador, Basel and Bali.

IADI's interactive web portal facilitates research and provides information on deposit insurance topics and activities to members and participants.

IADI website: [www.iadi.org](http://www.iadi.org).

## Other areas of central bank cooperation promoted by the BIS

### *Research activities*

In addition to providing background material for meetings of senior central bankers, as well as 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 specialised professional and academic publications. Most of the Bank's research is published on its website ([www.bis.org](http://www.bis.org)).

In line with the Bank's mission, the long-term focus of the research is on monetary and financial stability issues. Themes receiving special attention during the past year included:

- the financial market turmoil: its causes and policy implications;
- the behaviour of the interbank market;
- the macroprudential approach to financial stability and the coordination between monetary and prudential policies;
- changes in the financial system and the transmission mechanism of monetary policy;
- transparency and communication in monetary policy;
- the use of dynamic stochastic general equilibrium (DSGE) models in the policy process;
- the measurement and pricing of credit risk;
- the term structure of interest rates, with particular reference to term premia;
- trends in international banking; and
- foreign exchange reserve management practices.

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 2007, the Sixth BIS Annual Conference addressed the nexus between financial system and macroeconomic resilience.

In the second half of 2007, the BIS also organised two meetings for central bank researchers designed to illuminate the policymaking process. The first, which was held in September with the participation of academics, explored the usefulness of DSGE models as policy tools. The second, held in November, and partly based on an ad hoc survey, was devoted to a systematic analysis of the preparation of the statistical and analytical inputs for monetary policy decisions and the communication of the outputs.

### *Central bank governance*

The BIS's support for actions to improve the governance of central banks as public policy institutions is coordinated through the Central Bank Governance Forum. The Governance Forum consists of the Central Bank Governance Group (comprising Governors from a broadly based and representative group of central banks), the Central Bank Governance Network (now spanning almost 50 central banks and monetary authorities) and a Secretariat.

The work is carried out by compiling, analysing and disseminating information on different approaches to the operation and governance of central banks. Interest from central banks in specific matters determines the issues that are addressed. Last year, interest extended to issues as diverse as central bank communications, the operation of central bank policymaking and oversight boards, staff input into monetary policy decisions, the organisation of the lender of last resort function, and central bank remuneration principles and practices. In addition, a comprehensive report on the organisation of risk management in central banks was released to central banks. At present, work is under way on distilling key elements in the design of a modern central bank from the information that has been amassed over the years. A new information system is also being developed that will provide much improved access to comparative data on central banks' governance and organisation to central banks.

### *Cooperation in the statistical area*

Timely, reliable and internationally comparable economic, monetary and financial statistics are of key importance to policymakers and market participants. The BIS closely monitors, and actively contributes to, ongoing efforts to improve statistics at the international, regional and national level, particularly as regards statistics on financial developments.

#### *Irving Fisher Committee on Central Bank Statistics*

By the end of 2007, all BIS shareholding central banks had become institutional members 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 is chaired by Jan Smets, Director at the National Bank of Belgium.

In August 2007, the IFC organised various meetings at the 56th Session of the International Statistical Institute in Lisbon. Topics included the recording of pension liabilities in national accounts, measures of stocks and flows in financial accounts, measures of output and prices of financial services, and portfolio investment statistics. The IFC also organised a series of regional workshops, in India, Argentina and Austria, on the use of surveys by central banks, co-sponsored by the respective host countries' central banks and respective regional central bank organisations. In March 2008 the IFC organised a workshop on "Challenges to improve global comparison of securities statistics" at the IMF.

Proceedings of IFC meetings are published in the *IFC Bulletin* and posted on the BIS website. The Committee has also launched a Working Paper series which contains analysis by experts of the Committee's institutional members as well as those outside the central banking community.

#### *International financial statistics*

Last year, 54 central banks contributed to the BIS's seventh Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, covering daily turnover in foreign exchange and derivatives markets in April 2007 and amounts outstanding and gross market values at the end of June. Thanks to improved compilation procedures, the final findings were published in December, three months earlier than in 2004.

The movements revealed by the BIS quarterly statistics on cross-border banking and securities issuance as well as its semiannual statistics on over-the-counter derivatives were of particular significance during the recent period of financial market turmoil. The banking and securities statistics produced by the BIS are also an important data source for the Joint External Debt Hub (JEDH), established in cooperation with the IMF, OECD and World Bank. Cooperation between the BIS and the International Union of Credit and Investment Insurers (the Berne Union) has resulted in new trade credit data for the JEDH as from early 2008.

In January 2008, 35 central banks were represented at the BIS's biennial meeting of Experts on International Financial Statistics. Discussions focused on methodological and organisational aspects of the various BIS-sponsored data collection exercises. Last year, the Bank also sought the cooperation of the central banks of the countries covered by the BIS domestic securities statistics to improve these in line with proposals made in the CGFS report on *Financial stability and local currency bond markets*.

#### *BIS Data Bank*

Forty-one BIS shareholding central banks participate in the BIS Data Bank, through which they regularly share national data with one another. Last year, the online facility for accessing the Data Bank was significantly improved. The coverage of the Data Bank was expanded by the inclusion of data on payment systems (in particular, data published by the CPSS), housing prices and daily central bank money market operations.

### *Statistical information technology*

Collecting, compiling, analysing and disseminating statistical data is resource-intensive, also in terms of information technology (IT). As part of a multi-year upgrade of its own IT applications, the BIS has put into production a new application for processing its international banking statistics. It is also studying how it can upgrade its application supporting the BIS Data Bank and promote the integration of its various databases and end user applications. Furthermore, a project is under way to improve the dissemination of statistics on the BIS website.

The BIS works closely with central banks to improve IT solutions for exchanging and processing statistical data and metadata. In particular, it contributes actively to the Statistical Data and Metadata Exchange (SDMX) initiative, a joint effort with the ECB, Eurostat, IMF, OECD, United Nations and World Bank. In February 2008, the UN Statistical Commission, attended by delegations from about 130 countries and 40 international organisations, recognised SDMX as the preferred standard for the exchange and sharing of data and metadata, and encouraged national and international statistical organisations to implement SDMX.

SDMX products are available via the SDMX website ([www.sdmx.org](http://www.sdmx.org)) and include:

- technical standards, approved by the International Organization for Standardization;
- content-oriented guidelines for exchange of data and metadata; and
- implementation tools that are made available by sponsoring organisations or private sector vendors.

In addition, the website provides information about SDMX-related developments in a growing number of statistical subject areas.

### *Group of Computer Experts of the G10 central banks*

The Group of Computer Experts (GCE) provides a twice-yearly forum for a number of key central banks to share technical and organisational experiences in the area of IT. Additionally, the Working Party on Security Issues (WPSI) meets twice a year on issues related to IT security.

In June 2007, the GCE held the Central Bank Information Technology Exchange (CBITX), its triennial workshop, hosted this time by the Monetary Authority of Singapore. This was preceded by a regional workshop, hosted by the BIS, with members of the GCE and IT representatives from selected regional central banks. Presentation and discussion sessions covered and openly shared views on knowledge management, chargeback for IT services, applications deployment across very large-scale organisations, IT risk management, “build or buy” for applications, and support requirements for high-availability systems.

At their November meeting, GCE members approved the formation of a working group to enhance the planning of content and format for future meetings. Special interest groups will be formed to cover topics of long-term interest that can be cooperatively developed and presented over a series of

meetings. In March 2008, recognising the growing relationship between cyber- and physical security, a joint workshop was organised by the WPSI and the Heads of Security (HOS) from the G10 central banks plus security experts from major non-G10 central banks. Topics discussed included business continuity management, risk management, and organisation and strategy. Following the success of this workshop, the WPSI and HOS groups will look at possible future cooperation.

### *Cooperation with regional central bank groupings*

The BIS cooperates with regional central bank groupings primarily to disseminate its research, policy analysis and statistics to those central banks which do not normally participate in its regular activities. During the past year the cooperation included:

- two seminars on "Financial stability analysis and reports", one organised for central banks from central and eastern Europe and the Commonwealth of Independent States at the Joint Vienna Institute, and the other for central banks and monetary agencies of the Gulf Cooperation Council (GCC) in Riyadh, hosted by the Saudi Arabian Monetary Agency (the BIS also supported the South East Asian Central Banks (SEACEN) in organising a seminar on this topic); 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.

In spring 2007, the annual meeting of the Group of Coordinators of Technical Cooperation and Training was held in Yerevan. Some 50 representatives from 36 institutions were invited to discuss recent developments in technical cooperation among participating central banks and international financial institutions. The Group also sponsored the organisation of a meeting of global training providers which took place at the BIS in autumn 2007. This was attended by representatives of 30 international and national institutions that provide significant international training programmes for central banks. Discussions focused on training activities, organisational and operational aspects, and current and possible future areas of cooperation.

### *Internal Audit*

G10 central bank internal auditors meet regularly to share experience and knowledge in their area of expertise, and to address new issues and challenges. The main topics for discussion usually derive from international auditing standards and the continuous need to improve control over the risks faced by central banks. Twice a year, the BIS's Internal Audit unit organises and hosts the meetings of the G10 Working Party on IT Audit Methodologies.

In June 2007, the BIS participated in the 21st Annual Plenary Conference of G10 Heads of Internal Audit, hosted by the Federal Reserve Bank of New York. It covered topics such as: reporting to the board on internal controls;

cultural issues and the role of internal audit; business continuity management; key performance indicators; and use of risk models.

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 2007, Internal Audit and the Asian Office organised in Hong Kong SAR the fifth BIS meeting of heads of internal audit from central banks in that region.

## 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 130 such authorities, 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 – and ultimately to the General Manager – monitors the Bank's credit exposure, 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) directly with it: 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 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.

The Bank transacts foreign exchange and gold on behalf of its customers. From time to time, it extends short-term credits to central banks, usually on a collateralised basis. The BIS also acts as trustee and collateral agent (see below).

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 out of two linked trading rooms: one at the Bank's Basel head office and one at its Asian Office in Hong Kong SAR.

## *Financial operations in 2007/08*

In the conditions of financial turmoil that began during the summer of 2007, the Bank was confronted with increased inflows of deposits at a time when the highly disturbed market conditions made it difficult to place them profitably in the private financial markets at acceptable risk. Accordingly, the BIS took a number of active measures in its banking and risk management to address these challenges.

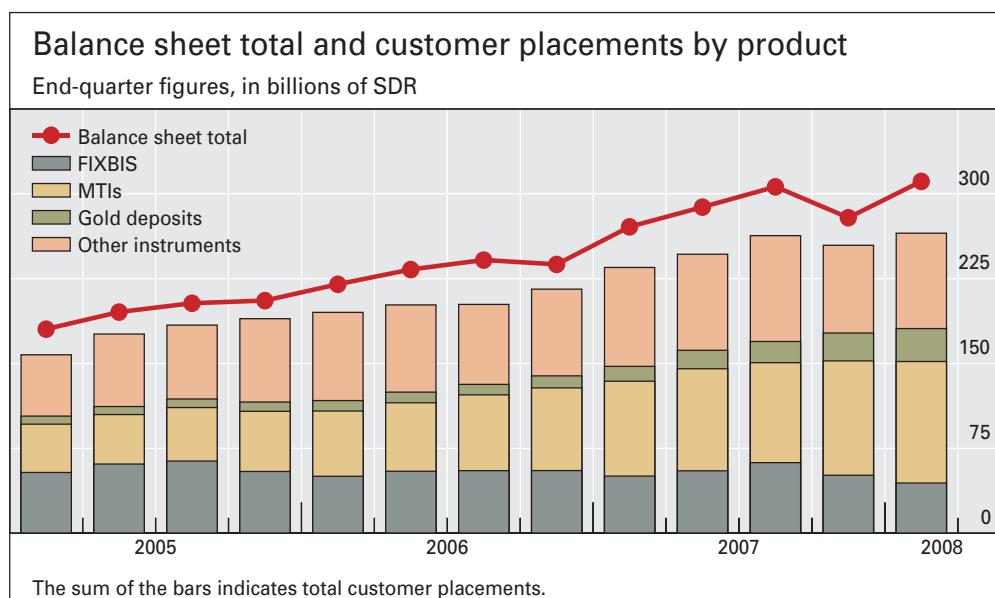
One set of measures was designed to slow down the inflow of deposits by making their yields somewhat less attractive to customers. As a result of these and other actions, growth in the Bank's currency deposit base decelerated to SDR 14.3 billion in 2007/08, from an average annual growth of SDR 35.6 billion in the preceding two years. The proportion of total official foreign exchange reserves held at the BIS declined modestly in 2007/08, to 5.8% from 6.2% a year earlier.

The growth of the total balance sheet moderated to SDR 40.2 billion in 2007/08, from SDR 50.8 billion in 2006/07. As a result, the balance sheet total amounted to SDR 311.1 billion at 31 March 2008.

### *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 2008, customer placements (excluding repurchase agreements) amounted to SDR 265.2 billion, compared with SDR 234.9 billion at the end of the previous financial year.

Around 89% of customer placements are denominated in currencies, with the remainder in gold. Currency deposits rose from SDR 221.8 billion a year ago to SDR 236.1 billion at end-March 2008 – representing some 5.8% of the world's total foreign exchange reserves of nearly SDR 4.1 trillion, up from SDR 3.6 trillion at end-March 2007. The share of



currency placements denominated in US dollars was 66%, whereas euro-denominated funds accounted for 20%. Gold deposits amounted to SDR 29.1 billion at end-March 2008, an increase of SDR 16.0 billion over the financial year.

The expansion of customer currency placements was mainly attributable to a 64% and 28% increase in investments in sight and notice accounts and MTIs, respectively. This expansion more than offset a 33% decrease in investments in fixed-term deposits.

A breakdown by geographical regions of placements with the BIS shows a relatively stable pattern, with African and European customers accounting for the highest share.

#### *Assets*

Most of the assets held by the BIS consist of investments with highly rated commercial banks of international standing as well as government and quasi-government securities, including reverse repurchase agreements. In addition, the Bank owned 125 tonnes of fine gold at 31 March 2008, having disposed of 25 tonnes during the financial year. The credit exposure is managed in a very conservative manner, with almost all of the Bank's credit exposure rated A- or higher as at 31 March 2008 (see note 3F of the "Risk management" section of the financial statements).

The Bank's holdings of currency deposits and securities, including reverse repurchase agreements, totalled SDR 266.6 billion on 31 March 2008, up from SDR 247.9 billion at the end of the previous financial year. These additional funds were mainly invested in reverse repurchase agreements against government collateral, treasury bills and government and other securities. Time deposits and advances to banks were reduced.

The Bank uses various derivative instruments in order to manage its assets and liabilities efficiently (see note 8 to the financial statements).

#### *Agent and trustee functions*

##### *Trustee for international government loans*

The Bank continued during the year 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 2007 the Bundesamt für zentrale Dienste und offene Vermögensfragen (BADV – Federal Office for Central Services and Unresolved Property Issues) had arranged for payment of approximately €4.7 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 2007/08, 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).

## Institutional and administrative matters

### *The Bank's administration*

#### *Three-Year Strategic Plan*

During 2007, the Management of the Bank elaborated its first Three-Year Strategic Plan, covering the financial years to March 2011. Approved by the Board in November 2007, it seeks to deepen and broaden key activities under the Bank's established mandate by:

- strengthening the work of the BIS in fostering central bank cooperation;
- deepening the dialogue among central banks and financial supervisors on issues of financial stability; and
- enhancing the banking services that the BIS provides to central banks.

#### *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 expenses, including remuneration, pensions and health and accident insurance, amount to around 70% of administrative costs. 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 during the financial year 2007/08 amounted to 233.1 million Swiss francs, 2.4% below the budget of 238.8 million Swiss francs,<sup>1</sup> while capital expenditure, at 24.0 million Swiss francs, was 0.7 million below budget.

<sup>1</sup> The Bank's budgetary accounting 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").

Administrative and capital expenditure reflected the priorities set in the 2007/08 budget, in which the main emphasis was on further strengthening the resilience of the Bank's operations and enhancing its financial controls, in particular:

- to strengthen financial reporting and control in the General Secretariat and back office and support functions in the Banking Department. This initiative complemented the enhancements made in recent years to the Bank's risk management, internal audit and compliance functions; and
- to plan for enhanced business continuity arrangements to take effect in 2008/09 at a site in Europe remote from Basel.

In addition to these objectives, work continued on the following initiatives to meet the needs of the Bank's shareholders:

- expanding BIS services to deepen relations with shareholders in the Asia-Pacific region through continuation of the three-year policy-oriented research programme on monetary and financial sector issues in Asia which began in September 2006;
- implementing the results of the activity review undertaken during 2005/06, which identified a number of areas where efficiency gains can be realised. The implementation of the activity review has already led, and will continue to lead over the next few years, to a reduction of administrative costs in Basel, thereby providing the room for additional resources for enhancing services to central banks; and
- reinforcing building safety, renewing meeting facilities in the Tower building and renovating the Sports Club buildings.

#### *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. As of 1 July 2008, it will result in an alignment of the midpoints of the Bank's salary ranges with the observed market benchmarks.

In years between comprehensive salary surveys, the salary structure is adjusted for the rate of inflation in Switzerland and the weighted average real wage increase in the G10 countries. In July 2007, the salary structure was accordingly increased by 2.9% in nominal terms. 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-Swiss

and non-locally hired 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 or 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.<sup>2</sup> 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 the former are determined in accordance with the Bank's international assignment policy. For staff directly recruited for a position in a Representative Office, 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 for a position at the Bank's headquarters.

The salaries of senior officials are regularly benchmarked against compensation in comparable institutions and market segments. In line 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 2007, the annual remuneration of senior officials, before expatriation allowances, is based on the following salary structure:

- General Manager<sup>3</sup> 734,990 Swiss francs
- Deputy General Manager 621,910 Swiss francs
- Heads of Department 565,380 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 992,760 Swiss francs as at 1 April 2008. 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 921,120 Swiss francs.

## Financial results and profit distribution

### *Financial results*

#### *Background*

The Bank's financial results for the 78th financial year, 2007/08, were achieved against a background of the turbulence in the global financial markets in

<sup>2</sup> Certain staff members who joined the Bank before 1997 receive an expatriation allowance of 25%, but are not entitled to receive an education allowance.

<sup>3</sup> In addition to the basic salary, the General Manager receives an annual representation allowance and enhanced pension rights.

which the BIS operates. The main developments were a marked increase in uncertainties about the creditworthiness of counterparties, a rise in credit spreads, and substantial volatility in market prices. In these conditions, there was a “flight to quality”, as a result of which the market values of government securities and the price of gold both rose markedly.

In the face of volatile market pricing and increased deposit inflows arising from this flight to quality, the Bank was confronted with the combined challenge of moderating deposit inflows and continuing to invest its borrowed resources profitably, while maintaining a conservative risk profile. Accordingly, Management widened the spreads below Libor for the interest rates the Bank pays on the key classes of liabilities that it offers to central bank customers. This was done in several steps, each time carefully gauging market developments. In parallel, measures were also taken to reduce credit risk exposure to commercial bank counterparties, while increasing investments in government securities and collateralised lending to the banking sector in the form of reverse repurchase agreements. These actions restrained the growth in deposits during the remainder of the financial year and preserved the underlying profitability of the Bank.

### *Highlights*

As a result of these developments:

- Interest margins on an accruals basis in the Bank’s borrowed funds book widened.
- 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.
- Unrealised valuation losses also resulted from the rise in the fair value of the Bank’s liabilities as spreads on interest payable below Libor were increased.
- Substantial realised and unrealised gains on the Bank’s own funds investments arose as the price of gold and market values of government securities both appreciated.

These factors led to:

- Declines in the Bank’s net profit (-12.0%) and operating profit (-49.9%) compared with 2006/07.<sup>4</sup> If the change in accounting policy to introduce bid-offer pricing had not been made, the decline in net profit would have been 3.1%, and that in operating profit 37.7%.
- An increase in the Bank’s equity of SDR 1,011 million during 2007/08, compared to an increase in equity of SDR 552 million in 2006/07.
- A significant increase in the return on equity to 9.1% in 2007/08, compared to 5.8% in 2006/07.

### *Detailed review (see profit and loss account)*

Net interest income accrued was SDR 973.4 million in the financial year 2007/08, 57.8% higher than the equivalent figure of SDR 616.8 million in

<sup>4</sup> Part of the reduction in operating profit for 2007/08 resulted from the move to the bid-offer valuation convention in accordance with generally accepted accounting practice.

2006/07. This increase was primarily attributable to the higher interest accruals margin arising from wider spreads above Libor received on the Bank's risk-weighted assets, as well as to the wider spreads below Libor paid on the Bank's liabilities, resulting from the Management decisions described above.

Net valuation movements resulted in a loss of SDR 478.7 million in 2007/08, compared to a profit of SDR 63.3 million in 2006/07.<sup>5</sup> Within this loss, SDR 362.4 million was attributable to the unrealised valuation loss from the widening of credit spreads compared to Libor, which reduced the fair values of the bonds in the Bank's credit portfolios. This unrealised loss amounts to around 1 per cent of the value of these portfolios (SDR 36 billion), which are invested in top-quality financial instruments. Since the Bank normally holds these investments until they mature, most of this unrealised valuation loss will be recovered over the period to maturity in the next two to three years. The remaining unrealised valuation loss (SDR 116.3 million) was attributable to the impact of the widening of the spreads below Libor on the fair values of the Bank's deposit liabilities, which increased their fair value. Most of this valuation loss will also be recovered over the next two financial years. Together, these two types of unrealised losses incurred in 2007/08 will build in a strong positive dynamic for the Bank's operating profit over the next two and a half years.

In 2007/08, a net exchange loss of SDR 9.5 million was incurred, which was attributable to the impact of the appreciation of the Swiss franc against the SDR on the Bank's net liabilities in that currency. In 2006/07, there was a small exchange gain (SDR 0.9 million).

Operating expense (see note 26 to the financial statements) amounted to SDR 154.5 million, 3.1% above the preceding year's figure (SDR 149.8 million). Administrative expenses before depreciation amounted to SDR 141.9 million, 3.4% above the previous year's figure (SDR 137.8 million). The depreciation charge of SDR 12.6 million was slightly higher than the equivalent figure for 2006/07.

As a result of the above factors, the operating profit before the change of accounting policy for the introduction of bid-offer valuation of financial instruments, which reflects the profits of the Bank's ongoing business on the same basis as in previous financial years, amounted to SDR 331.5 million, 37.7% lower than the equivalent figure of SDR 532.5 million for 2006/07.

The change in accounting policy to introduce bid-offer accounting for all financial instruments resulted in a charge against profits of SDR 75.0 million, which was primarily due to the widening of offer spreads on the Bank's MTI liabilities. The equivalent figure for the previous financial

<sup>5</sup> 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.

year was a charge of SDR 20.2 million. As a result of this change, the Bank's financial liabilities are valued at their offer prices and financial assets are valued at their bid prices.

After taking into account the change in accounting policy, the Bank's operating profit amounted to SDR 256.5 million, 49.9% lower than the equivalent figure of SDR 512.3 million recorded in 2006/07.

A net loss of SDR 5.1 million was incurred on the sale of investment securities during the financial year. This resulted from the realignment of the Bank's investment portfolio to its underlying benchmark position and reflected the sale of securities acquired when interest rates were lower. In 2006/07, a net loss of SDR 27.0 million was recorded for the sale of investment securities.

The realised gain of SDR 293.3 million on sales of gold investment assets during 2007/08 arose from the sale of 25 tonnes from the Bank's total holdings of 150 tonnes at 31 March 2007. In 2006/07, a lower gain (SDR 133.9 million) was recorded on the sale of 15 tonnes of the Bank's own gold at the lower gold prices then prevailing.

As a result of these factors, the net profit for the 78th financial year, 2007/08, amounted to SDR 544.7 million, 12.0% lower than the equivalent figure of SDR 619.2 million in the preceding year, which has been restated to reflect the change of accounting policy described above. If the change in accounting policy to introduce bid-offer pricing had not been made, net profit for 2007/08 would have been SDR 619.7 million, 3.1% lower than the equivalent figure of SDR 639.4 million in 2006/07.

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, respectively, which are accounts which form part of the Bank's equity.

The securities revaluation account increased by SDR 352.5 million as a result of unrealised gains on investment securities (+SDR 347.4 million) and a transfer of realised losses (+SDR 5.1 million) from the profit and loss account.

The gold revaluation account also increased, by SDR 252.8 million, as a result of unrealised gains of SDR 546.1 million resulting from the impact of the appreciating gold price in 2007/08 on the Bank's own gold holdings. Of this amount, SDR 293.3 million was transferred to the profit and loss account, being realised gains on the sales of gold investment assets.

After taking these gains into account, the Bank's total return<sup>6</sup> was SDR 1,150.0 million. This represented a return of 9.1% on average equity (SDR 12,586 million). In 2006/07, the total return was SDR 684.8 million, and the return on average equity (SDR 11,860 million) was 5.8%. Taking into account the payment of the dividend for 2006/07 and the move to bid-offer pricing, the Bank's equity increased by SDR 1,010.7 million. This compares with an equivalent increase of SDR 552.4 million in 2006/07.

<sup>6</sup> The total return is shown in the financial statements as "Total recognised income" in the table entitled "Movements in the Bank's equity".

### *Proposed dividend*

During the financial year 2005/06, the Board reviewed the dividend policy of the BIS, taking 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 255 in 2006/07. The Board also decided to review the dividend policy every two to three years, taking into account changing circumstances where necessary. The Board review of the level of the dividend, originally scheduled for 2007/08, will take place in the financial year 2008/09. Taking into account the developments in 2007/08 described above, the Board proposes that the dividend for 2007/08 be increased again by SDR 10 to 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 544.7 million for the financial year 2007/08 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 40.0 million to be transferred to the general reserve fund;<sup>7</sup>
3. SDR 6.0 million to be transferred to the special dividend reserve fund; and
4. SDR 354.0 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.

If approved, the dividend will be paid on 3 July 2008 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 2008. The proposed dividend of SDR 265 per share for the financial year 2007/08 represents a 3.9% increase over the dividend for 2006/07.

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 2008, namely the suspended shares of the Albanian issue. No dividend will be paid on these treasury shares.

### *Allocation of reduction of the Bank's statutory reserves at 31 March 2007*

The introduction of the new accounting policy for bid-offer valuations of the Bank's financial instruments has decreased the Bank's statutory reserves at

<sup>7</sup> Since the general reserve fund exceeded four times the Bank's paid-up capital at 31 March 2007, 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.

31 March 2007 by SDR 71.3 million, of which SDR 20.2 million relates to the financial year 2006/07 and SDR 51.1 million to financial years before 2006/07. The Board of Directors recommends that this decrease be reflected in reductions in the Bank's free reserve fund of SDR 20.2 million for 2006/07 and SDR 51.1 million for the financial years before 2006/07.

*Report of the auditors*

The Bank's financial statements have been duly audited by Deloitte AG, who have confirmed that they give a true and fair view of the Bank's financial position at 31 March 2008 and the results of its operations for the year then ended. Their report is to be found immediately following the financial statements.

## Board of Directors

Jean-Pierre Roth, Zurich  
Chairman of the Board of Directors

Hans Tietmeyer, Frankfurt am Main  
Vice-Chairman

Ben S Bernanke, Washington  
Mark Carney, Ottawa  
Mario Draghi, Rome  
Timothy F Geithner, New York  
Lord George, London  
Stefan Ingves, Stockholm  
Mervyn King, London  
Jean-Pierre Landau, Paris  
Christian Noyer, Paris  
Guillermo Ortiz, Mexico City  
Guy Quaden, Brussels  
Fabrizio Saccomanni, Rome  
Masaaki Shirakawa, Tokyo  
Jean-Claude Trichet, Frankfurt am Main  
Alfons Vicomte Verplaetse, Brussels  
Axel A Weber, Frankfurt am Main  
Nout H E M Wellink, Amsterdam  
Zhou Xiaochuan, Beijing

### *Alternates*

Giovanni Carosio or Ignazio Visco, Rome  
Pierre Jaitte or Michel Cardona, Paris  
Donald L Kohn or D Nathan Sheets, Washington  
Peter Praet or Jan Smets, Brussels  
Hermann Remsperger or Wolfgang Mörke, Frankfurt am Main  
Paul Tucker or Paul Fisher, London

### *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 Jean-Pierre Roth

## Senior officials

Malcolm D Knight	General Manager
Hervé Hannoun	Deputy General Manager
Peter Dittus	Secretary General, Head of Department
William R White	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

By letter dated 20 July 2007, Christian Noyer, Governor of the Bank of France, appointed Jean-Pierre Landau, Second Deputy Governor of the Bank of France, as a member of the Board of Directors for a period of three years from 1 September 2007 to 31 August 2010.

On 31 January 2008, David Dodge retired as Governor of the Bank of Canada and vacated his seat on the Board. At its meeting in March 2008, the Board elected Mark Carney, the new Governor of the Bank of Canada and successor to David Dodge, as a member of the Board of Directors for the remaining period of Mr Dodge's term of office ending on 12 September 2009.

At the same meeting, the Board re-elected Stefan Ingves, Governor of Sveriges Riksbank, as a member of the Board of Directors for a period of three years ending on 31 March 2011.

Toshihiko Fukui retired as Governor of the Bank of Japan on 19 March 2008 and vacated his seat on the Board. At its meeting in May 2008, the Board elected Masaaki Shirakawa, Mr Fukui's successor as Governor of the Bank of Japan, as a member of the Board of Directors for the remaining period of Mr Fukui's term of office expiring on 12 September 2009.

By letter dated 4 April 2008, Mervyn King, Governor of the Bank of England, reappointed Lord George as a member of the Board of Directors for a period of three years ending on 6 May 2011.

At its meeting in May 2007, the Board extended the appointment of Malcolm D Knight as the Bank's General Manager and chief executive officer from the end of his original five-year term (31 March 2008). His term now ends on 30 June 2009.

At its meeting in March 2008, the Board appointed Stephen G Cecchetti as successor to William R White as BIS Economic Adviser and Head of the Monetary and Economic Department for a period of five years, beginning on 1 July 2008.

## BIS member central banks<sup>8</sup>

Bank of Algeria	Bank of Japan
Central Bank of Argentina	Bank of Korea
Reserve Bank of Australia	Bank of Latvia
Austrian National Bank	Bank of Lithuania
National Bank of Belgium	National Bank of the Republic of Macedonia
Central Bank of Bosnia and Herzegovina	Central Bank of Malaysia
Central Bank of Brazil	Bank of Mexico
Bulgarian National Bank	Netherlands Bank
Bank of Canada	Reserve Bank of New Zealand
Central Bank of Chile	Central Bank of Norway
People's Bank of China	Bangko Sentral ng Pilipinas
Croatian National Bank	National Bank of Poland
Czech National Bank	Bank of Portugal
National Bank of Denmark	National Bank of Romania
Bank of Estonia	Central Bank of the Russian Federation
European Central Bank	Saudi Arabian Monetary Agency
Bank of Finland	Monetary Authority of Singapore
Bank of France	National Bank of Slovakia
Deutsche Bundesbank	Bank of Slovenia
Bank of Greece	South African Reserve Bank
Hong Kong Monetary Authority	Bank of Spain
Magyar Nemzeti Bank (Hungary)	Sveriges Riksbank (Sweden)
Central Bank of Iceland	Swiss National Bank
Reserve Bank of India	Bank of Thailand
Bank Indonesia	Central Bank of the Republic of Turkey
Central Bank & Financial Services Authority of Ireland	Bank of England
Bank of Israel	Board of Governors of the Federal Reserve System
Bank of Italy	

<sup>8</sup> 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, with two separate central banks, and the Republic of Montenegro's subsequent declaration of independence from the State Union in May 2006.



## Financial statements

as at 31 March 2008

The financial statements on pages 192–249 for the financial year ended 31 March 2008 were approved on 5 May 2008 for presentation to the Annual General Meeting on 30 June 2008. 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.

Jean-Pierre Roth  
Chairman

Malcolm D Knight  
General Manager

## Balance sheet

As at 31 March 2008

<i>SDR millions</i>	Notes	2008	2007 restated
<b>Assets</b>			
Cash and sight accounts with banks	4	36.8	92.4
Gold and gold deposits	5	31,537.7	15,457.6
Treasury bills	6	50,736.9	43,159.3
Securities purchased under resale agreements	6	91,884.6	61,189.8
Time deposits and advances to banks	7	62,095.9	91,233.8
Government and other securities	6	61,918.5	52,244.0
Derivative financial instruments	8	7,426.4	1,850.8
Accounts receivable	9	5,311.8	5,473.6
Land, buildings and equipment	10	190.4	188.0
<b>Total assets</b>		<b>311,139.0</b>	270,889.3
<b>Liabilities</b>			
Currency deposits	11	236,120.9	221,798.7
Gold deposits	12	29,101.4	13,134.9
Securities sold under repurchase agreements	13	1,894.1	1,062.5
Derivative financial instruments	8	6,227.7	2,843.0
Accounts payable	14	24,365.4	19,584.1
Other liabilities	15	326.5	373.8
<b>Total liabilities</b>		<b>298,036.0</b>	258,797.0
<b>Shareholders' equity</b>			
Share capital	16	683.9	683.9
Statutory reserves	17	9,967.3	9,487.4
Profit and loss account		544.7	619.2
Less: shares held in treasury	18	(1.7)	(1.7)
Other equity accounts	19	1,908.8	1,303.5
<b>Total equity</b>		<b>13,103.0</b>	12,092.3
<b>Total liabilities and equity</b>		<b>311,139.0</b>	270,889.3

## Profit and loss account

For the financial year ended 31 March 2008

<i>SDR millions</i>	Notes	2008	2007 restated
Interest income	21	11,181.2	8,858.0
Interest expense	22	(10,207.8)	(8,241.2)
<b>Net interest income</b>		<b>973.4</b>	616.8
Net valuation movement excluding bid-offer adjustment	23	(478.7)	63.3
<b>Net interest and valuation income</b>		<b>494.7</b>	680.1
Net fee and commission income	24	0.8	1.3
Net foreign exchange gain / (loss)	25	(9.5)	0.9
<b>Total operating income</b>		<b>486.0</b>	682.3
Operating expense	26	(154.5)	(149.8)
<b>Operating profit before change of accounting policy</b>		<b>331.5</b>	532.5
Introduction of bid-offer valuation for financial instruments	23	(75.0)	(20.2)
<b>Operating profit</b>		<b>256.5</b>	512.3
Net loss on sales of securities available for sale	27	(5.1)	(27.0)
Net gain on sales of gold investment assets	28	293.3	133.9
<b>Net profit for the financial year</b>		<b>544.7</b>	619.2
<b>Basic and diluted earnings per share (in SDR per share)</b>	29	<b>997.4</b>	1,133.8

## Statement of cash flows

For the financial year ended 31 March 2008

<i>SDR millions</i>	Notes	2008	2007 restated
<b>Cash flow from / (used in) operating activities</b>			
Interest and similar income received		11,665.4	8,260.0
Interest and similar expenses paid		(10,118.3)	(7,824.7)
Net fee and commission income		0.8	1.3
Foreign exchange transaction income		4.5	6.7
Operating expenses paid		(141.9)	(138.1)
<b>Non-cash flow items included in operating profit</b>			
Valuation movements on operating assets and liabilities		(553.7)	43.1
Foreign exchange translations loss		(14.0)	(5.8)
Change in accruals and amortisation		(573.7)	181.8
<b>Change in operating assets and liabilities</b>			
Currency deposit liabilities held at fair value through profit and loss		(1,445.5)	36,228.9
Currency banking assets		(13,174.8)	(39,233.1)
Sight and notice deposit account liabilities		15,966.5	2,106.3
Gold deposit liabilities		15,842.8	3,899.3
Gold and gold deposit banking assets		(15,961.7)	(4,063.0)
Accounts receivable		13.4	(15.8)
Other liabilities / accounts payable		(46.9)	205.6
Net derivative financial instruments		(2,190.9)	254.1
<b>Net cash flow used in operating activities</b>		<b>(728.0)</b>	<b>(93.4)</b>
<b>Cash flow from / (used in) investment activities</b>			
Net change in currency investment assets available for sale	6B	(1,479.4)	105.5
Net change in currency investment assets held at fair value through profit and loss		(9.3)	(548.9)
Securities sold under repurchase agreements		831.6	(159.9)
Net change in gold investment assets	5B	245.0	208.4
Net purchase of land, buildings and equipment	10	(15.0)	(11.6)
<b>Net cash flow used in investment activities</b>		<b>(427.1)</b>	<b>(406.5)</b>

<i>SDR millions</i>	Notes	<b>2008</b>	2007 restated
<b>Cash flow used in financing activities</b>			
Dividends paid		(139.3)	(132.4)
Shares repurchased in 2001 – payments to former shareholders		(0.5)	(1.3)
<b>Net cash flow used in financing activities</b>		<b>(139.8)</b>	<b>(133.7)</b>
 <b>Total net cash flow</b>		<b>(1,294.9)</b>	<b>(633.6)</b>
 Net effect of exchange rate changes on cash and cash equivalents		101.0	(85.8)
Net movement in cash and cash equivalents		(1,395.9)	(547.8)
<b>Net decrease in cash and cash equivalents</b>		<b>(1,294.9)</b>	<b>(633.6)</b>
 <b>Cash and cash equivalents, beginning of year</b>	30	<b>2,231.0</b>	2,864.6
<b>Cash and cash equivalents, end of year</b>	30	<b>936.1</b>	2,231.0

## Movements in the Bank's equity

For the financial year ended 31 March 2008

<i>SDR millions</i>	Notes	Share capital	Statutory reserves	Profit and loss	Shares held in treasury	Other equity accounts	Total equity
<b>Equity at 31 March 2006 – as previously stated</b>		<b>683.9</b>	<b>9,071.7</b>	<b>599.2</b>	<b>(1.7)</b>	<b>1,237.9</b>	<b>11,591.0</b>
Introduction of bid-offer valuation for financial instruments – proposed transfer from reserves	3	–	(51.1)	–	–	–	(51.1)
<b>Equity at 31 March 2006 – as restated</b>		<b>683.9</b>	<b>9,020.6</b>	<b>599.2</b>	<b>(1.7)</b>	<b>1,237.9</b>	<b>11,539.9</b>
<b>Income:</b>							
Net profit for 2006/07		–	–	639.4	–	–	639.4
Change of accounting policy: introduction of bid-offer valuation for financial instruments	3	–	–	(20.2)	–	–	(20.2)
<b>Net profit for 2006/07 – as restated</b>		<b>–</b>	<b>–</b>	<b>619.2</b>	<b>–</b>	<b>–</b>	<b>619.2</b>
Net valuation movement on gold investment assets	19B	–	–	–	–	41.8	41.8
Net valuation movement on securities available for sale	19A	–	–	–	–	23.8	23.8
<b>Total recognised income</b>		<b>–</b>	<b>–</b>	<b>619.2</b>	<b>–</b>	<b>65.6</b>	<b>684.8</b>
Payment of 2005/06 dividend		–	–	(132.4)	–	–	(132.4)
Allocation of 2005/06 profit		–	466.8	(466.8)	–	–	–
<b>Equity at 31 March 2007 – as restated</b>		<b>683.9</b>	<b>9,487.4</b>	<b>619.2</b>	<b>(1.7)</b>	<b>1,303.5</b>	<b>12,092.3</b>

<i>SDR millions</i>	<i>Notes</i>	<i>Share capital</i>	<i>Statutory reserves</i>	<i>Profit and loss</i>	<i>Shares held in treasury</i>	<i>Other equity accounts</i>	<i>Total equity</i>
<b>Equity at 31 March 2007 – as restated</b>		<b>683.9</b>	<b>9,487.4</b>	<b>619.2</b>	<b>(1.7)</b>	<b>1,303.5</b>	<b>12,092.3</b>
<b>Income:</b>							
Net profit for 2007/08		–	–	544.7	–	–	544.7
Net valuation movement on gold investment assets	19B	–	–	–	–	252.8	252.8
Net valuation movement on securities available for sale	19A	–	–	–	–	352.5	352.5
<b>Total recognised income</b>		<b>–</b>	<b>–</b>	<b>544.7</b>	<b>–</b>	<b>605.3</b>	<b>1,150.0</b>
Payment of 2006/07 dividend		–	–	(139.3)	–	–	(139.3)
Allocation of 2006/07 profit		–	500.1	(500.1)	–	–	–
Introduction of bid-offer valuation for financial instruments – proposed transfer from reserves	3	–	(20.2)	20.2	–	–	–
<b>Equity at 31 March 2008 per balance sheet before proposed profit allocation</b>		<b>683.9</b>	<b>9,967.3</b>	<b>544.7</b>	<b>(1.7)</b>	<b>1,908.8</b>	<b>13,103.0</b>
Proposed dividend		–	–	(144.7)	–	–	(144.7)
Proposed transfers to reserves		–	400.0	(400.0)	–	–	–
<b>Equity at 31 March 2008 after proposed profit allocation</b>		<b>683.9</b>	<b>10,367.3</b>	<b>–</b>	<b>(1.7)</b>	<b>1,908.8</b>	<b>12,958.3</b>

At 31 March 2008 statutory reserves included share premiums of SDR 811.7 million (2007: SDR 811.7 million).

## Statement of proposed profit allocation

For the financial year ended 31 March 2008

<i>SDR millions</i>	<i>Notes</i>	<b>2008</b>
<b>Net profit for the financial year</b>		<b>544.7</b>
Transfer to legal reserve fund	17	–
<b>Proposed dividend:</b>		
SDR 265 per share on 546,125 shares		(144.7)
<b>Proposed transfers to reserves:</b>		
General reserve fund	17	(40.0)
Special dividend reserve fund	17	(6.0)
Free reserve fund	17	(354.0)
<b>Balance after allocation to reserves</b>		–

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 2008

<i>SDR millions</i>	<i>Notes</i>	<b>2008</b>				
		Legal reserve fund	General reserve fund	Special dividend reserve fund	Free reserve fund	Total statutory reserves
<b>Balance at 31 March 2007</b>		<b>68.3</b>	<b>2,959.8</b>	<b>142.0</b>	<b>6,368.4</b>	<b>9,538.5</b>
Allocation of 2006/07 profit	17	–	50.0	6.0	444.1	500.1
Change of accounting policy: Impact of introduction of bid-offer valuation for financial instruments – proposed reduction in reserves for:						
– financial years prior to 2006/07	3	–	–	–	(51.1)	(51.1)
– 2006/07	3	–	–	–	(20.2)	(20.2)
<b>Balance at 31 March 2008 per balance sheet before proposed profit allocation</b>		<b>68.3</b>	<b>3,009.8</b>	<b>148.0</b>	<b>6,741.2</b>	<b>9,967.3</b>
Proposed transfers to reserves	17	–	40.0	6.0	354.0	400.0
<b>Balance at 31 March 2008 after proposed profit allocation</b>		<b>68.3</b>	<b>3,049.8</b>	<b>154.0</b>	<b>7,095.2</b>	<b>10,367.3</b>

# 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 33.

## 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 0–1 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 accounts with banks, call and notice accounts 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 accounts with banks, and call and notice accounts) 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. Call and notice accounts**

Call and 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 "Time deposits and advances to banks".

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".

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, time deposits and advances to banks 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".

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, time deposits and advances to banks, 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".

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 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 deposit assets**

Gold deposit assets comprise fixed-term gold loans to commercial banks. Gold is considered by the Bank to be a financial instrument.

Gold deposit assets 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 deposit assets is included in interest income on an accruals basis. The treatment of realised and unrealised gains or losses on gold is described in Section 17 below.

## **16. Gold deposit liabilities**

Gold deposit liabilities comprise sight and fixed-term deposits of gold from central banks. Gold is considered by the Bank to be a financial instrument.

Gold deposit liabilities 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 deposit liabilities is included in interest expense on an accruals 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 deposit liabilities and related gold banking assets***

The Bank designates gold deposit assets in its banking portfolios as loans and receivables and gold deposit liabilities 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".

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".

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 and key inputs are periodically reviewed by qualified personnel independent of the Banking Department.

The Bank has an independent price verification unit which periodically reviews 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. 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.

## **22. 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.

## **23. 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.

## **24. 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.

### **25. 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, the Management uses available information, exercises judgment and makes assumptions.

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.

Judgment is exercised when selecting and applying the Bank's accounting policies. The judgments relating to the designation and valuation of financial instruments are another key element in the preparation of these financial statements.

Subsequent actual results could differ materially from those estimates.

### ***Significant judgments relating to 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	2008	2007
Securities purchased under resale agreements	0.5	0.4
Time deposits and advances to banks	6.2	4.8
Government and other securities	9.9	9.3
Currency deposits	30.0	23.3
Derivative financial instruments	16.2	11.1

### 3. Impact of change of accounting policy

During the financial year 2007/08 the Bank changed its valuation policy for financial instruments. All financial assets are now valued using bid prices, and all financial liabilities are now valued using offer prices. The Bank believes that this change in valuation policy better reflects the fair value of its financial instruments and brings its valuation policy into line with recent developments in global accounting frameworks. The following table shows the previous and new valuation conventions:

	Previous valuation convention	New valuation convention
Securities purchased under resale agreements	Current replacement cost (offer)	Bid prices
Time deposits and advances to banks	Current replacement cost (offer)	Bid prices
Currency deposits	Mid prices	Offer prices
Derivative financial instruments	Mid prices	Bid-offer basis

The change in the Bank's valuation policy has affected the balance sheet, profit and loss account, equity and the statement of cash flows of the Bank as presented below:

#### For the financial year ended 31 March 2008

<i>SDR millions</i>	As stated before change of accounting policy	Effect of change of accounting policy	As stated in the accounts
<b>Balance sheet</b>			
Assets			
Securities purchased under resale agreements	91,889.4	(4.8)	91,884.6
Time deposits and advances to banks	62,137.8	(41.9)	62,095.9
<b>Total effect on assets</b>		<b>(46.7)</b>	
Liabilities			
Currency deposits	236,054.2	66.7	236,120.9
Derivative financial instruments	6,194.6	32.9	6,227.7
<b>Total effect on liabilities</b>		<b>99.6</b>	
<b>Shareholders' equity</b>			
Operating profit for 2007/08	331.5	(75.0)	256.5
Statutory reserves (prior year profit)	10,038.6	(71.3)	9,967.3
<b>Total effect on shareholders' equity</b>		<b>(146.3)</b>	
<b>Statement of cash flows</b>			
Valuation movements on operating assets and liabilities	(478.7)	(75.0)	(553.7)
Net change in currency deposit liabilities	(1,503.5)	58.0	(1,445.5)
Net change in currency banking assets	(13,185.6)	10.8	(13,174.8)
Net change in derivative financial instruments	(2,197.1)	6.2	(2,190.9)
<b>Total effect on cash flows from / (used in) operating activities</b>			–

For the financial year ended 31 March 2007

<i>SDR millions</i>	As stated before change of accounting policy	Effect of change of accounting policy	As stated in the accounts
<b>Balance sheet</b>			
Assets			
Securities purchased under resale agreements	61,193.5	(3.7)	61,189.8
Time deposits and advances to banks	91,266.0	(32.2)	91,233.8
<b>Total effect on assets</b>		(35.9)	
Liabilities			
Currency deposits	221,790.1	8.6	221,798.7
Derivative financial instruments	2,816.2	26.8	2,843.0
<b>Total effect on liabilities</b>		35.4	
<b>Shareholders' equity</b>			
Operating profit for 2006/07	532.5	(20.2)	512.3
Statutory reserves (prior year profit)	9,538.5	(51.1)	9,487.4
<b>Total effect on shareholders' equity</b>		(71.3)	
<b>Statement of cash flows</b>			
Valuation movements on operating assets and liabilities	63.3	(20.2)	43.1
Net change in currency deposit liabilities	36,225.5	3.4	36,228.9
Net change in currency banking assets	(39,242.4)	9.3	(39,233.1)
Net change in derivative financial instruments	246.6	7.5	254.1
<b>Total effect on cash flows from / (used in) operating activities</b>		–	

#### 4. 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.

For the financial year ended 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Balance at beginning of year	2,306.0	2,259.5
Net change in gold investment assets		
Deposits placed	–	338.7
Disposals of gold	(414.3)	(206.7)
Maturities and other net movements	169.3	(340.4)
	(245.0)	(208.4)
Net change in transactions awaiting settlement	(182.7)	79.2
Gold price movement	546.1	175.7
<b>Balance at end of year</b>	<b>2,424.4</b>	<b>2,306.0</b>

#### 5. Gold and gold deposits

##### A. Total gold holdings

The composition of the Bank's total gold holdings was as follows:

As at 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Gold bars held at central banks	27,530.9	11,865.8
Total gold time deposits	4,006.8	3,591.8
<b>Total gold and gold deposit assets</b>	<b>31,537.7</b>	<b>15,457.6</b>
Comprising:		
Gold investment assets	2,424.4	2,306.0
Gold and gold deposit banking assets	29,113.3	13,151.6

##### 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 19 provides further analysis of the gold revaluation account. Note 28 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:

At 1 April 2007 the Bank's gold investment assets amounted to 150 tonnes of fine gold. During the financial year ended 31 March 2008 25 tonnes of fine gold (31 March 2007: 15 tonnes) were disposed of (see note 28). The balance at 31 March 2008 amounted to 125 tonnes of fine gold.

#### 6. 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 most part, the investment of the Bank's equity.

*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 and international institutions, including advances made as part of committed and uncommitted standby facilities. The balance sheet total "Time deposits and advances to banks" also includes call and notice accounts (see note 7).

*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 2008 <i>SDR millions</i>	Banking assets		Investment assets		<b>Total currency assets</b>
	Held at fair value through profit and loss	Available for sale	Held at fair value through profit and loss	Total	
Treasury bills	<b>50,708.8</b>	–	28.1	<b>28.1</b>	<b>50,736.9</b>
Securities purchased under resale agreements	<b>89,991.1</b>	1,893.5	–	<b>1,893.5</b>	<b>91,884.6</b>
Fixed-term loans and advances to banks	<b>61,196.6</b>	–	–	–	<b>61,196.6</b>
<b>Government and other securities</b>					
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
	<b>51,500.8</b>	<b>9,813.9</b>	<b>603.8</b>	<b>10,417.7</b>	<b>61,918.5</b>
<b>Total currency assets</b>	<b>253,397.3</b>	<b>11,707.4</b>	<b>631.9</b>	<b>12,339.3</b>	<b>265,736.6</b>

As at 31 March 2007 – restated <i>SDR millions</i>	Banking assets		Investment assets		<b>Total currency assets</b>
	Held at fair value through profit and loss	Available for sale	Held at fair value through profit and loss	Total	
Treasury bills	43,135.1	–	24.2	24.2	43,159.3
Securities purchased under resale agreements	60,127.3	1,062.5	–	1,062.5	61,189.8
Fixed-term loans and advances to banks	89,095.2	–	–	–	89,095.2
<b>Government and other securities</b>					
Government	3,397.3	6,717.6	–	6,717.6	10,114.9
Financial institutions	27,866.0	953.6	598.4	1,552.0	29,418.0
Other (including public sector securities)	11,601.0	1,110.1	–	1,110.1	12,711.1
	<b>42,864.3</b>	<b>8,781.3</b>	<b>598.4</b>	<b>9,379.7</b>	<b>52,244.0</b>
<b>Total currency assets</b>	<b>235,221.9</b>	<b>9,843.8</b>	<b>622.6</b>	<b>10,466.4</b>	<b>245,688.3</b>

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 16.6 million (2007: SDR 14.5 million).

#### **B. Currency assets available for sale**

The Bank's currency investment assets related 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

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Balance at beginning of year	9,843.8	9,994.0
Net change in currency assets available for sale		
Additions	20,990.3	16,800.7
Disposals	(2,195.9)	(2,265.5)
Maturities and other net movements	(17,315.0)	(14,640.7)
	1,479.4	(105.5)
Net change in transactions awaiting settlement	36.8	(41.5)
Fair value and other movements	347.4	(3.2)
<b>Balance at end of year</b>	<b>11,707.4</b>	<b>9,843.8</b>

Note 19 provides further analysis of the securities revaluation account. Note 27 provides further analysis of the net gain on sales of securities designated as available for sale.

#### **7. Time deposits and advances to banks**

Time deposits and advances to banks comprise fixed-term loans and call and notice accounts.

Fixed-term loans are designated as held at fair value through profit and loss. Call and 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

<i>SDR millions</i>	<b>2008</b>	<b>2007 restated</b>
Fixed-term loans and advances to banks	61,196.6	89,095.2
Call and notice accounts	899.3	2,138.6
<b>Total time deposits and advances to banks</b>	<b>62,095.9</b>	<b>91,233.8</b>

The amount of change in fair value recognised in the profit and loss on time deposits and advances is SDR 88.8 million (2007: SDR 58.8 million).

## 8. 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.

*Options on futures* are contractual agreements that confer the right, but not the obligation, to buy or sell a futures contract at a predetermined price during a specified period of time. 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 11 and 12). 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 <i>SDR millions</i>	2008		2007 restated			
	Notional amounts	Fair values	Notional amounts	Fair values		
	Assets	Liabilities	Assets	Liabilities		
Bond futures	1,367.8	1.4	(1.4)	809.5	0.6	(0.4)
Cross-currency interest rate swaps	3,836.0	117.6	(750.7)	5,262.3	99.4	(658.7)
Currency and gold forwards	1,095.0	21.0	(13.4)	1,830.7	9.9	(13.9)
Currency and gold options	4,669.0	64.0	(64.9)	9,180.9	42.4	(62.3)
Currency and gold swaps	127,026.0	1,372.2	(3,119.1)	62,829.9	210.7	(497.5)
Forward rate agreements	26,377.0	22.2	(27.3)	48,018.6	6.2	(6.7)
Interest rate futures	10,114.0	0.9	(0.2)	43,239.3	–	(1.3)
Interest rate swaps	360,306.4	5,824.7	(2,194.0)	406,871.3	1,480.7	(1,593.5)
Options on futures	–	–	–	396.0	0.5	–
Swaptions	6,162.7	2.4	(56.7)	4,159.1	0.4	(8.7)
<b>Total derivative financial instruments at end of year</b>	<b>540,953.9</b>	<b>7,426.4</b>	<b>(6,227.7)</b>	<b>582,597.6</b>	<b>1,850.8</b>	<b>(2,843.0)</b>
<b>Net derivative financial instruments at end of year</b>			<b>1,198.7</b>			<b>(992.2)</b>

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 16.2 million (2007: SDR 11.1 million).

## 9. Accounts receivable

As at 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Financial transactions awaiting settlement	5,301.1	5,449.5
Other assets	10.7	24.1
<b>Total accounts receivable</b>	<b>5,311.8</b>	<b>5,473.6</b>

"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.

## 10. Land, buildings and equipment

<i>SDR millions</i>	For the financial year ended 31 March			<b>2008</b>	<b>2007</b>
	Land	Buildings	IT and other equipment	Total	Total
<b>Historical cost</b>					
Balance at beginning of year	41.2	186.6	106.6	334.4	324.5
Capital expenditure	–	2.8	12.2	15.0	11.6
Disposals and retirements	–	–	(0.3)	(0.3)	(1.7)
<b>Balance at end of year</b>	<b>41.2</b>	<b>189.4</b>	<b>118.5</b>	<b>349.1</b>	<b>334.4</b>
<b>Depreciation</b>					
Accumulated depreciation at beginning of year	–	80.5	65.9	146.4	136.1
Depreciation	–	4.2	8.4	12.6	12.0
Disposals and retirements	–	–	(0.3)	(0.3)	(1.7)
<b>Balance at end of year</b>	<b>–</b>	<b>84.7</b>	<b>74.0</b>	<b>158.7</b>	<b>146.4</b>
<b>Net book value at end of year</b>	<b>41.2</b>	<b>104.7</b>	<b>44.5</b>	<b>190.4</b>	<b>188.0</b>

The depreciation charge for the financial year ended 31 March 2008 includes an additional charge of SDR 1.1 million for IT and other equipment following an impairment review (2007: SDR 0.8 million).

## 11. 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 <i>SDR millions</i>	<b>2008</b>	<b>2007 restated</b>
<b>Deposit instruments repayable at one to two days' notice</b>		
Medium-Term Instruments (MTIs)	99,372.5	76,112.0
Callable MTIs	8,024.2	7,740.5
FIXBIS	44,403.4	50,513.2
	<b>151,800.1</b>	134,365.7
<b>Other currency deposits</b>		
FRIBIS	4,218.1	3,465.2
Fixed-term deposits	39,606.2	59,314.0
Sight and notice deposit accounts	40,496.5	24,653.8
	<b>84,320.8</b>	87,433.0
<b>Total currency deposits</b>	<b>236,120.9</b>	221,798.7
Comprising:		
Designated as held at fair value through profit and loss	195,624.4	197,144.9
Designated as financial liabilities measured at amortised cost	40,496.5	24,653.8

*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 2008 and December 2009 (2007: April 2007 and May 2008).

*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. The Bank also takes 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 (dual currency deposits). The amount of dual currency deposits included in the balance sheet at 31 March 2008 was SDR 161.4 million (2007: SDR 6,654.9 million). These deposits all matured in April 2008 (2007: between April and June 2007).

*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 2008, is SDR 234,822.0 million (2007: SDR 224,059.0 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 30.0 million (2007: SDR 23.3 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.

## 12. Gold deposit liabilities

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. The amount of gold dual currency deposits within gold deposit liabilities at 31 March 2008 was SDR 54.1 million (2007: none). All of these deposits matured in April 2008.

## 13. 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.

As at 31 March 2008 and 2007 all of the securities sold under repurchase agreements were associated with the management of currency assets available for sale. They are therefore all designated as financial liabilities measured at amortised cost.

## 14. 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.

## 15. Other liabilities

As at 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Post-employment benefit obligations (see note 20)		
Directors' pensions	4.8	4.3
Health and accident benefits	185.4	152.1
Short positions in currency assets	115.6	142.4
Other	20.1	73.9
Payable to former shareholders	0.6	1.1
<b>Total other liabilities</b>	<b>326.5</b>	<b>373.8</b>

## 16. Share capital

The Bank's share capital consists of:

As at 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
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
<b>Paid-up capital (25%)</b>	<b>683.9</b>	<b>683.9</b>

The number of shares eligible for dividend is:

As at 31 March	<b>2008</b>	<b>2007</b>
Issued shares	547,125	547,125
Less: shares held in treasury	(1,000)	(1,000)
<b>Outstanding shares eligible for full dividend</b>	<b>546,125</b>	<b>546,125</b>
<b>Dividend per share (in SDR)</b>	<b>265</b>	<b>255</b>

## 17. 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.

## 18. Shares held in treasury

For the financial year ended 31 March	2008	2007
Balance at beginning of year	1,000	1,000
Movements during the year	-	-
<b>Balance at end of year</b>	<b>1,000</b>	<b>1,000</b>

The shares held in treasury consist of 1,000 shares of the Albanian issue which were suspended in 1977.

## 19. 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 6 and 5 respectively.

Other equity accounts comprise:

As at 31 March

SDR millions	2008	2007
Securities revaluation account	272.0	(80.5)
Gold revaluation account	1,636.8	1,384.0
<b>Total other equity accounts</b>	<b>1,908.8</b>	<b>1,303.5</b>

### 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	2008	2007
Balance at beginning of year	(80.5)	(104.3)
<b>Net valuation movement</b>		
Net loss on sales	5.1	27.0
Fair value and other movements	347.4	(3.2)
	352.5	23.8
<b>Balance at end of year</b>	<b>272.0</b>	<b>(80.5)</b>

The tables below analyse the balance in the securities revaluation account:

<b>As at 31 March 2008</b>	<b>Fair value of assets</b>	<b>Historical cost</b>	<b>Securities revaluation account</b>	<b>Gross gains</b>	<b>Gross losses</b>
<i>SDR millions</i>					
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)
<b>Total</b>	<b>11,707.4</b>	<b>11,435.4</b>	<b>272.0</b>	<b>305.4</b>	<b>(33.4)</b>

<b>As at 31 March 2007</b>	<b>Fair value of assets</b>	<b>Historical cost</b>	<b>Securities revaluation account</b>	<b>Gross gains</b>	<b>Gross losses</b>
<i>SDR millions</i>					
Securities purchased under resale agreements	1,062.5	1,062.5	–	–	–
Government and other securities	8,781.3	8,861.8	(80.5)	37.2	(117.7)
<b>Total</b>	<b>9,843.8</b>	<b>9,924.3</b>	<b>(80.5)</b>	<b>37.2</b>	<b>(117.7)</b>

#### **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

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Balance at beginning of year	<b>1,384.0</b>	1,342.2
<b>Net valuation movement</b>		
Net gain on sales	(293.3)	(133.9)
Gold price movement	546.1	175.7
	<b>252.8</b>	<b>41.8</b>
<b>Balance at end of year</b>	<b>1,636.8</b>	1,384.0

## 20. 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	2008	2007	2006
Present value of obligation	(709.7)	(653.7)	(606.4)
Fair value of fund assets	714.3	648.6	602.2
Funded status	4.6	(5.1)	(4.2)
Unrecognised actuarial losses	41.2	47.3	46.8
Unrecognised past service cost	(45.8)	(42.2)	(42.6)
<b>Liability at end of year</b>	<b>–</b>	<b>–</b>	<b>–</b>

SDR millions	As at 31 March		
	2008	2007	2006
Present value of obligation	(5.4)	(4.6)	(4.6)
Fair value of fund assets	–	–	–
Funded status	(5.4)	(4.6)	(4.6)
Unrecognised actuarial losses	0.6	0.3	0.3
Unrecognised past service cost	–	–	–
<b>Liability at end of year</b>	<b>(4.8)</b>	<b>(4.3)</b>	<b>(4.3)</b>

SDR millions	As at 31 March		
	2008	2007	2006
Present value of obligation	(208.0)	(186.3)	(183.8)
Fair value of fund assets	–	–	–
Funded status	(208.0)	(186.3)	(183.8)
Unrecognised actuarial losses	30.3	42.0	57.2
Unrecognised past service cost	(7.7)	(7.8)	(8.6)
<b>Liability at end of year</b>	<b>(185.4)</b>	<b>(152.1)</b>	<b>(135.2)</b>

**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 <i>SDR millions</i>	Staff pensions		Directors' pensions		Post-employment health and accident benefits	
	2008	2007	2008	2007	2008	2007
Present value of obligation at beginning of year	653.7	606.4	4.6	4.5	186.3	183.8
Current service cost	30.5	28.3	0.2	0.2	8.2	7.9
Employee contributions	3.7	3.4	–	–	–	–
Interest cost	21.3	19.8	0.1	0.1	6.1	6.1
Actuarial (gain) / loss	(55.7)	3.5	–	–	(13.9)	(13.9)
Benefit payments	(23.1)	(21.8)	(0.3)	(0.3)	(1.8)	(1.9)
Exchange differences	79.3	14.1	0.9	0.1	23.1	4.3
<b>Present value of obligation at end of year</b>	<b>709.7</b>	653.7	<b>5.4</b>	4.6	<b>208.0</b>	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

<i>SDR millions</i>	2008	2007
Fair value of fund assets at beginning of year	648.6	602.2
Expected return on fund assets	33.1	30.6
Actuarial gain / (loss)	(44.8)	4.1
Employer contributions	17.3	15.9
Employee contributions	3.7	3.4
Benefit payments	(23.1)	(21.8)
Exchange differences	79.5	14.2
<b>Fair value of fund assets at end of year</b>	<b>714.3</b>	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	2008	2007	2008	2007	2008	2007
Current service cost	30.5	28.3	0.2	0.2	8.2	7.9
Interest cost	21.3	19.8	0.1	0.1	6.1	6.1
Less: expected return on fund assets	(33.1)	(30.7)	–	–	–	–
Less: past service cost	(1.5)	(1.5)	–	–	(1.0)	(1.0)
Net actuarial losses recognised in year	–	–	–	–	1.6	2.6
<b>Total included in operating expense</b>	<b>17.2</b>	<b>15.9</b>	<b>0.3</b>	<b>0.3</b>	<b>14.9</b>	<b>15.6</b>

The Bank expects to make a contribution to its post-employment arrangements of CHF 31.9 million in 2008/09.

**E. Major categories of fund assets as a percentage of total fund assets**

As at 31 March

Percentages	2008	2007
European equities	12.8	16.4
Other equities	17.4	28.4
European fixed income	32.2	25.8
Other fixed income	27.1	26.6
Other assets	10.5	2.8
Actual return on fund assets	(1.7%)	5.4%

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

	2008	2007
<b>Applicable to all three post-employment benefit arrangements</b>		
Discount rate – market rate of highly rated Swiss corporate bonds	3.75%	3.25%
<b>Applicable to staff and Directors' pension arrangements</b>		
Assumed increase in pensions payable	1.50%	1.50%
<b>Applicable to staff pension arrangement only</b>		
Expected return on fund assets	5.00%	5.00%
Assumed salary increase rate	4.10%	4.10%
<b>Applicable to Directors' pension arrangement only</b>		
Assumed Directors' pensionable remuneration increase rate	1.50%	1.50%
<b>Applicable to post-employment health and accident benefit arrangement only</b>		
Long-term medical 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 2008 (2007: 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 2007/08 calculation would have the following effects:

For the financial year ended 31 March

<i>SDR millions</i>	2008	2007
Increase / (decrease) of the total service and interest cost		
6% medical inflation	7.5	4.6
4% medical inflation	(4.9)	(3.3)

As at 31 March

<i>SDR millions</i>	2008	2007
Increase / (decrease) of the benefit obligation		
6% medical inflation	45.5	47.0
4% medical inflation	(34.5)	(35.4)

## 21. Interest income

For the financial year ended 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
<b>Currency assets available for sale</b>		
Securities purchased under resale agreements	71.1	59.2
Government and other securities	380.9	328.9
	<b>452.0</b>	<b>388.1</b>
<b>Currency assets held at fair value through profit and loss</b>		
Treasury bills	861.6	816.0
Securities purchased under resale agreements	2,480.9	811.4
Time deposits and advances to banks	4,147.8	4,179.3
Government and other securities	2,301.2	1,727.2
	<b>9,791.5</b>	<b>7,533.9</b>
<b>Assets designated as loans and receivables</b>		
Sight and notice accounts	38.4	108.3
Gold investment assets	11.2	15.4
Gold banking assets	5.4	6.7
	<b>55.0</b>	<b>130.4</b>
<b>Derivative financial instruments held at fair value through profit and loss</b>		
	<b>882.7</b>	<b>805.6</b>
<b>Total interest income</b>	<b>11,181.2</b>	<b>8,858.0</b>

## 22. Interest expense

For the financial year ended 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
<b>Liabilities held at fair value through profit and loss</b>		
Currency deposits	<b>8,963.7</b>	7,596.9
<b>Liabilities designated as financial liabilities measured at amortised cost</b>		
Gold deposits	3.9	5.2
Sight and notice deposit accounts	1,171.7	581.6
Securities sold under repurchase agreements	68.5	57.5
	<b>1,244.1</b>	<b>644.3</b>
<b>Total interest expense</b>	<b>10,207.8</b>	<b>8,241.2</b>

### 23. Net valuation movement

The net valuation movement arises entirely on financial instruments designated as held at fair value through profit and loss.

SDR millions	For the financial year ended 31 March			2008			2007 restated		
	Valuation movement excluding bid-offer adjustment	Impact of bid-offer valuation	Total net valuation movement	Valuation movement excluding bid-offer adjustment	Impact of bid-offer valuation	Total net valuation movement			
<b>Currency assets held at fair value through profit and loss</b>									
Unrealised valuation movements on currency assets	29.6	(10.8)	18.8	(6.8)	(9.3)	(16.1)			
Realised gains / (losses) on currency assets	(11.7)	–	(11.7)	(30.2)	–	(30.2)			
	<b>17.9</b>	<b>(10.8)</b>	<b>7.1</b>	<b>(37.0)</b>	<b>(9.3)</b>	<b>(46.3)</b>			
<b>Currency liabilities held at fair value through profit and loss</b>									
Unrealised valuation movements on financial liabilities	(2,774.2)	(58.0)	(2,832.2)	(510.6)	(3.4)	(514.0)			
Realised gains on financial liabilities	(257.2)	–	(257.2)	132.4	–	132.4			
	<b>(3,031.4)</b>	<b>(58.0)</b>	<b>(3,089.4)</b>	<b>(378.2)</b>	<b>(3.4)</b>	<b>(381.6)</b>			
<b>Valuation movements on derivative financial instruments</b>									
	<b>2,534.8</b>	<b>(6.2)</b>	<b>2,528.6</b>	<b>478.5</b>	<b>(7.5)</b>	<b>471.0</b>			
<b>Net valuation movement</b>	<b>(478.7)</b>	<b>(75.0)</b>	<b>(553.7)</b>	<b>63.3</b>	<b>(20.2)</b>	<b>43.1</b>			

### 24. Net fee and commission income

For the financial year ended 31 March

SDR millions	2008	2007
Fee and commission income	6.8	6.1
Fee and commission expense	(6.0)	(4.8)
<b>Net fee and commission income</b>	<b>0.8</b>	<b>1.3</b>

### 25. Net foreign exchange gain / (loss)

For the financial year ended 31 March

SDR millions	2008	2007
Net transaction gain	4.5	6.7
Net translation loss	(14.0)	(5.8)
<b>Net foreign exchange gain / (loss)</b>	<b>(9.5)</b>	<b>0.9</b>

## 26. 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

<i>CHF millions</i>	<b>2008</b>	<b>2007</b>
<b>Board of Directors</b>		
Directors' fees	1.9	1.9
Pensions to former Directors	0.6	0.6
Travel, external Board meetings and other costs	1.7	1.7
	<b>4.2</b>	<b>4.2</b>
<b>Management and staff</b>		
Remuneration	111.8	106.6
Pensions	34.3	32.5
Other personnel-related expense	43.1	45.6
	<b>189.2</b>	<b>184.7</b>
<b>Office and other expense</b>	<b>63.5</b>	64.6
<b>Administrative expense in CHF millions</b>	<b>256.9</b>	253.5
Administrative expense in SDR millions	141.9	137.8
Depreciation in SDR millions	12.6	12.0
<b>Operating expense in SDR millions</b>	<b>154.5</b>	149.8

The average number of full-time equivalent employees during the financial year ended 31 March 2008 was 542 (2007: 530).

## 27. Net loss on sales of securities available for sale

For the financial year ended 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Disposal proceeds	2,195.9	2,265.5
Amortised cost	(2,201.0)	(2,292.5)
<b>Net loss</b>	<b>(5.1)</b>	<b>(27.0)</b>
Comprising:		
Gross realised gains	51.8	63.0
Gross realised losses	(56.9)	(90.0)

## 28. Net gain on sales of gold investment assets

For the financial year ended 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Disposal proceeds	414.3	206.7
Deemed cost (see note 19B)	(121.0)	(72.8)
<b>Net realised gain</b>	<b>293.3</b>	<b>133.9</b>

## 29. Earnings per share

For the financial year ended 31 March	<b>2008</b>	<b>2007</b> restated
Net profit for the financial year (SDR millions)	544.7	619.2
Weighted average number of shares entitled to dividend	546,125	546,125
<b>Basic and diluted earnings per share (SDR per share)</b>	<b>997.4</b>	1,133.8

The dividend proposed for the financial year ended 31 March 2008 is SDR 265 per share (2007: SDR 255).

### 30. Cash and cash equivalents

For the purposes of the cash flow statement, cash and cash equivalents comprise:

As at 31 March

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Cash and sight accounts with banks	36.8	92.4
Call and notice accounts	899.3	2,138.6
<b>Total cash and cash equivalents</b>	<b>936.1</b>	<b>2,231.0</b>

### 31. 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.

### 32. 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	
	<b>2008</b>	<b>2007</b>	<b>2008</b>	<b>2007</b>
USD	<b>0.609</b>	0.660	<b>0.643</b>	0.673
EUR	<b>0.960</b>	0.883	<b>0.910</b>	0.863
JPY	<b>0.00610</b>	0.00562	<b>0.00564</b>	0.00576
GBP	<b>1.208</b>	1.300	<b>1.291</b>	1.274
CHF	<b>0.612</b>	0.544	<b>0.556</b>	0.544
Gold	<b>557.8</b>	438.3	<b>490.2</b>	422.8

### 33. 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

<i>SDR millions</i>	<b>2008</b>	<b>2007</b>
Nominal value of securities held under:		
Safe custody arrangements	11,308.0	11,189.6
Collateral pledge agreements	158.9	223.6
Portfolio management mandates	6,093.9	5,535.4
<b>Total</b>	<b>17,560.8</b>	<b>16,948.6</b>

The financial instruments held under the above arrangements are deposited with external custodians, either central banks or commercial institutions.

### 34. Commitments

The Bank provides a number of committed standby facilities for its customers. As at 31 March 2008 the outstanding commitments to extend credit under these committed standby facilities amounted to SDR 6,767.7 million (2007: SDR 7,211.8 million), of which SDR 304.6 million was uncollateralised (2007: SDR 336.0 million).

### 35. 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 2008**

<i>Percentages</i>	USD	EUR	GBP	JPY	Other currencies
<b>Assets</b>					
<b>Gold deposits</b>					
Gold deposits	–	–	–	–	0.76
Treasury bills	0.73	4.02	–	0.58	–
Securities purchased under resale agreements	1.90	2.69	5.15	0.71	–
Time deposits and advances to banks	3.87	4.18	5.71	0.85	3.24
Government and other securities	3.21	4.10	4.19	0.98	7.39
<b>Liabilities</b>					
<b>Currency deposits</b>					
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	–	–	–	–

**As at 31 March 2007**

<i>Percentages</i>	USD	EUR	GBP	JPY	Other currencies
<b>Assets</b>					
<b>Gold deposits</b>					
Gold deposits	–	–	–	–	0.85
Treasury bills	5.27	3.48	–	0.52	–
Securities purchased under resale agreements	5.23	3.75	–	–	–
Time deposits and advances to banks	5.44	3.92	5.46	0.49	4.14
Government and other securities	5.13	3.83	5.36	0.78	6.41
<b>Liabilities</b>					
<b>Currency deposits</b>					
Currency deposits	5.04	3.79	5.21	0.36	6.56
Gold deposits	–	–	–	–	0.54
Securities sold under repurchase agreements	5.42	3.88	5.36	0.54	–
Short positions in currency assets	5.51	–	–	–	–

## 36. Geographical analysis

### A. Total liabilities

As at 31 March

SDR millions	2008	2007 restated
Africa and Europe	132,229.9	99,765.6
Asia-Pacific	102,353.8	99,335.5
Americas	54,810.3	51,776.2
International organisations	8,642.0	7,919.7
<b>Total</b>	<b>298,036.0</b>	258,797.0

### B. Credit commitments

As at 31 March

SDR millions	2008	2007
Africa and Europe	496.6	328.0
Asia-Pacific	6,109.7	6,817.8
Americas	161.4	66.0
<b>Total</b>	<b>6,767.7</b>	7,211.8

Note 34 provides further analysis of the Bank's credit commitments.

### C. Off-balance sheet items

As at 31 March

SDR millions	2008	2007
Africa and Europe	2,341.6	1,892.1
Asia-Pacific	14,695.6	14,325.4
Americas	523.6	731.1
<b>Total</b>	<b>17,560.8</b>	16,948.6

Note 33 provides further analysis of the Bank's off-balance sheet items. A geographical analysis of the Bank's assets is provided under "Risk Management" Section, note 3D below.

## 37. 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 20 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	2008	2007
Salaries, allowances and medical cover	6.7	6.7
Post-employment benefits	1.9	1.8
<b>Total compensation in CHF millions</b>	<b>8.6</b>	8.5
SDR equivalent	4.8	4.6

Note 26 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	2008	2007
Balance at beginning of year	15.6	13.3
Deposits taken including interest income (net of withholding tax)	3.8	3.5
Withdrawals	(1.4)	(1.2)
<b>Balance at end of year in CHF millions</b>	<b>18.0</b>	<b>15.6</b>
SDR equivalent	11.0	8.5
Interest expense on deposits in CHF millions	0.6	0.4
SDR equivalent	0.3	0.2

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 2008 was SDR 20.8 million (2007: SDR 18.9 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	2008	2007
Balance at beginning of year	53,240.1	53,280.0
Deposits taken	130,847.9	184,721.8
Maturities, repayments and fair value movements	(129,656.6)	(182,058.0)
Net movement on call / notice accounts	(433.1)	(2,703.7)
<b>Balance at end of year</b>	<b>53,998.3</b>	<b>53,240.1</b>
Percentage of total currency deposits at end of year	22.9%	24.0%

#### *Gold deposit liabilities from related party central banks and connected institutions*

For the financial year ended 31 March

SDR millions	2008	2007
Balance at beginning of year	10,123.8	6,267.3
Deposits taken	600.2	83.3
Net movement on gold sight accounts	16,161.2	3,875.5
Net withdrawals and gold price movements	(549.1)	(102.3)
<b>Balance at end of year</b>	<b>26,336.1</b>	<b>10,123.8</b>
Percentage of total gold deposits at end of year	90.5%	77.1%

#### *Securities purchased under resale transactions with related party central banks and connected institutions*

For the financial year ended 31 March

SDR millions	2008	2007
Balance at beginning of year	470.2	3,198.5
Collateralised deposits placed	776,745.9	680,101.7
Maturities and fair value movements	(773,944.2)	(682,830.0)
<b>Balance at end of year</b>	<b>3,271.9</b>	<b>470.2</b>
Percentage of total securities purchased under resale agreements at end of year	3.6%	0.8%

*Other balances with related party central banks and connected institutions*

The Bank maintains eight accounts in currencies with related party central banks and connected institutions, the total balance of which was SDR 539.3 million as at 31 March 2008 (2007: SDR 144.7 million). Gold held in eight accounts with related party central banks and connected institutions totalled SDR 27,499.7 million as at 31 March 2008 (2007: SDR 11,837.7 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 2008 was SDR 43,655.5 million (2007: SDR 17,005.8 million).

### **38. Contingent liabilities**

The Bank is indirectly involved in legal proceedings in France arising out of the mandatory repurchase in 2001 of the shares in the BIS held by private shareholders.

A damages claim was initiated in September 2004 before the Commercial Court in Paris by a group of claimants who allegedly sold BIS shares in the market during the period between the announcement of the proposed mandatory share repurchase on 11 September 2000 and the resolution on 8 January 2001 by the Extraordinary General Meeting effectuating the repurchase. The claim was brought not against the BIS, but rather against JP Morgan & Cie SA and Barbier Frinault, who advised the Bank on the appropriate compensation for the repurchase. That notwithstanding, the Bank faces indirect liability through an indemnification clause in its contract with JP Morgan & Cie SA with respect to litigation and costs that might arise in connection with the advisory services performed. No provision has been made for this claim.

In its judgment of 9 October 2006, the Commercial Court in Paris rejected the claim. A number of claimants have, however, requested review of this decision by the Paris Court of Appeals.

The BIS is not currently involved in any other significant legal proceedings.

# Capital adequacy

## 1. Capital

The Bank's capital components consist of share capital, statutory reserves, net profit for the year and other equity accounts, comprising the gold and securities revaluation accounts, less any shares held in treasury.

The table below shows the composition of the Bank's Tier 1 and total capital as at 31 March 2008.

As at 31 March

SDR millions	2008	2007 restated
Share capital	683.9	683.9
Statutory reserves per balance sheet	9,967.3	9,487.4
Less: shares held in treasury	(1.7)	(1.7)
Less: negative revaluation reserves	–	–
<b>Tier 1 capital</b>	<b>10,649.5</b>	10,169.6
Profit and loss account	544.7	619.2
Other equity accounts	1,908.8	1,303.5
<b>Total capital</b>	<b>13,103.0</b>	12,092.3

The Bank assesses its capital adequacy continuously. The assessment is supported by an annual capital planning process. The Bank's business planning supports this capital 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.

The Tier 1 capital for 31 March 2007 has been reduced by SDR 51.1 million following a change of accounting policy for bid-offer accounting of financial instruments.

## 2. 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 2008**

<i>SDR millions</i>	<i>Approach used</i>	<i>Risk-weighted assets</i>	<i>Minimum capital requirement</i>
<b>Credit risk</b>			
Exposure to sovereigns, banks and corporates	Advanced internal ratings-based approach, where (B) is derived as (A) x 8%	Amount of exposure 281,560.2	(A) 11,715.2 (B) 937.2
Securitisation exposures, externally managed portfolios and other assets	Standardised approach, where (B) is derived as (A) x 8%	4,048.3	1,349.1 107.9
<b>Market risk</b>			
Exposure to foreign exchange risk and gold price risk	Internal models approach, where (A) is derived as (B) / 8%	–	8,197.5 655.8
<b>Operational risk</b>	Advanced measurement approach, where (A) is derived as (B) / 8%	–	1,962.5 157.0
<b>Total</b>		<b>23,224.3</b>	<b>1,857.9</b>

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.

### 3. 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

<i>SDR millions</i>	<b>2008</b>
Tier 1 capital	10,649.5
Less: expected loss	(30.9)
<b>Tier 1 capital net of expected loss (A)</b>	<b>10,618.6</b>
Total risk-weighted assets (B)	23,224.3
<b>Tier 1 capital ratio (A) / (B)</b>	<b>45.7%</b>

As required by the Basel II Framework, expected loss is calculated for credit risk exposures subject to the advanced internal ratings-based approach. Since the BIS does not hold any provisions due to the high credit quality of its credit exposures, the Bank deducts the expected loss from Tier 1 capital consistent with 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 Basel Capital Accord of 1988 was 34.6% as at 31 March 2008 (2007 restated: 29.7%). 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.

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.

## 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 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 regular reports from the Risk Control unit and the Banking Department. The preparation of these 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 and operational risk, 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 a portfolio 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, a counterparty's 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, assuming a one-year time horizon and 99.995% confidence interval. 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 by asset class and issuer type**

The following table represents the exposure of the Bank to default risk at 31 March 2008, without taking account of any collateral held or other credit enhancements available to the Bank. 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. Gold and gold deposits 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. Commitments are shown at their notional amounts.

**Exposure to default risk as at 31 March 2008**

Asset class / issuer type <i>SDR millions</i>	Sovereign and central banks	Public sector	Banks	Corporate	Securitisation	Total
<b>On-balance sheet</b>						
Cash and sight accounts with banks	22.4	–	14.4	–	–	36.8
Gold and gold deposits	–	–	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
Time deposits and advances to banks	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	0	0	7,426.4
Accounts receivable	–	–	424.7	10.7	–	435.4
<b>Total on-balance sheet exposure</b>	<b>82,316.5</b>	<b>11,563.7</b>	<b>172,040.4</b>	<b>9,359.8</b>	<b>3,292.2</b>	<b>278,572.6</b>
<b>Commitments</b>						
Undrawn unsecured facilities	304.6	–	–	–	–	304.6
Undrawn secured facilities	6,463.1	–	–	–	–	6,463.1
<b>Total commitments</b>	<b>6,767.7</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>6,767.7</b>
<b>Total exposure</b>	<b>89,084.2</b>	<b>11,563.7</b>	<b>172,040.4</b>	<b>9,359.8</b>	<b>3,292.2</b>	<b>285,340.3</b>

Exposure to default risk as at 31 March 2007

Asset class / issuer type <i>SDR millions</i>	Sovereign and central banks	Public sector	Banks	Corporate	Securitisation	Total
<b>On-balance sheet</b>						
Cash	80.7	–	11.7	–	–	92.4
Gold and gold deposits	–	–	3,337.8	282.0	–	3,619.8
Treasury bills	43,159.3	–	–	–	–	43,159.3
Securities purchased under resale agreements	470.1	–	60,719.7	–	–	61,189.8
Time deposits and advances to banks	133.1	3,445.8	87,654.9	–	–	91,233.8
Government and other securities	10,616.2	9,243.6	25,550.2	2,887.6	3,946.4	52,244.0
Derivatives	23.4	0.1	1,827.3	–	–	1,850.8
Accounts receivable	–	–	466.1	24.1	–	490.2
<b>Total on-balance sheet exposure</b>	<b>54,482.8</b>	<b>12,689.5</b>	<b>179,567.7</b>	<b>3,193.7</b>	<b>3,946.4</b>	<b>253,880.1</b>
<b>Commitments</b>						
Undrawn unsecured facilities	336.0	–	–	–	–	336.0
Undrawn secured facilities	6,875.8	–	–	–	–	6,875.8
<b>Total commitments by issuer type</b>	<b>7,211.8</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>7,211.8</b>
<b>Total exposure</b>	<b>61,694.6</b>	<b>12,689.5</b>	<b>179,567.7</b>	<b>3,193.7</b>	<b>3,946.4</b>	<b>261,091.9</b>

The vast majority of the Bank's assets are invested in securities issued by G10 governments and financial institutions rated A– or above. Limitations on the number of high-quality counterparties in these sectors mean that the Bank is exposed to single-name concentration risk.

#### D. Default risk by geographical exposure

The following tables show the Bank's exposure to default risk, as categorised by geographical region. For these tables, the Bank has allocated exposures to regions based on the country of incorporation of each legal entity. Gold and gold deposits 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 exposures set out are at fair value with the exception of gold and very short-term financial instruments (sight and notice accounts), which are shown at amortised cost.

**As at 31 March 2008**

**Geographical exposure**

<i>SDR millions</i>	Africa and Europe	Asia-Pacific	Americas	International institutions	Total
<b>On-balance sheet</b>					
Cash and sight accounts with banks	25.6	1.2	10.0	–	36.8
Gold and gold deposits	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
Time deposits and advances to banks	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
<b>Total on-balance sheet exposure</b>	<b>196,712.2</b>	<b>48,187.2</b>	<b>27,173.4</b>	<b>6,499.8</b>	<b>278,572.6</b>
<b>Commitments</b>					
Undrawn unsecured facilities	304.6	–	–	–	304.6
Undrawn secured facilities	192.0	6,110.1	161.0	–	6,463.1
<b>Total commitments by region</b>	<b>496.6</b>	<b>6,110.1</b>	<b>161.0</b>	<b>–</b>	<b>6,767.7</b>
<b>Total exposure by region</b>	<b>197,208.8</b>	<b>54,297.3</b>	<b>27,334.4</b>	<b>6,499.8</b>	<b>285,340.3</b>

**As at 31 March 2007**

**Geographical exposure**

<i>SDR millions</i>	Africa and Europe	Asia-Pacific	Americas	International institutions	Total
<b>On-balance sheet</b>					
Cash	72.2	10.0	10.2	–	92.4
Gold and gold deposits	2,484.5	344.6	790.7	–	3,619.8
Treasury bills	22,477.1	18,021.4	2,660.8	–	43,159.3
Securities purchased under resale agreements	59,918.2	272.0	999.6	–	61,189.8
Time deposits and advances to banks	73,284.4	6,060.6	11,765.7	123.1	91,233.8
Government and other securities	32,827.1	9,141.6	8,831.3	1,444.0	52,244.0
Derivatives	1,435.2	34.5	381.1	–	1,850.8
Accounts receivable	24.1	–	466.1	–	490.2
<b>Total on-balance sheet exposure</b>	<b>192,522.8</b>	<b>33,884.7</b>	<b>25,905.5</b>	<b>1,567.1</b>	<b>253,880.1</b>
<b>Commitments</b>					
Undrawn unsecured facilities	138.0	198.0	–	–	336.0
Undrawn secured facilities	190.0	6,619.8	66.0	–	6,875.8
<b>Total commitments by region</b>	<b>328.0</b>	<b>6,817.8</b>	<b>66.0</b>	<b>–</b>	<b>7,211.8</b>
<b>Total exposure by region</b>	<b>192,850.8</b>	<b>40,702.5</b>	<b>25,971.5</b>	<b>1,567.1</b>	<b>261,091.9</b>

**E. Credit risk mitigation and collateral**

As at 31 March	2008		2007	
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	91,884.6	92,167.7	61,193.0	61,481.0
Interest rate swaps	2,979.3	2,429.7	(128.5)	26.8
<b>Total collateral obtained</b>	<b>94,863.9</b>	<b>94,597.4</b>	<b>61,064.5</b>	<b>61,507.8</b>
Collateral provided for				
Securities sold under repurchase agreements	1,894.1	1,898.2	1,062.5	1,055.9
<b>Total collateral provided</b>	<b>1,894.1</b>	<b>1,898.2</b>	<b>1,062.5</b>	<b>1,055.9</b>

The above table shows the collateral obtained and provided by the Bank. The Bank obtains collateral as part of reverse repurchase agreements and collateral agreements for certain interest rate swaps. 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 interest rate swaps comprises US treasuries. No collateral was repledged or sold during the financial year 2007/08.

The Bank grants facilities which are secured against either deposits made with the Bank or units held by customers in funds managed by the Bank. As of 31 March 2008 the total amount of undrawn facilities which could be drawn down subject to collateralisation by the counterparty was SDR 6,463.1 million (2007: SDR 6,875.8 million).

The Bank provides collateral for securities sold under repurchase agreements. This collateral consists of government or agency securities.

#### **F. Credit quality per class of financial asset**

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 of 31 March 2008 and 2007 the Bank had no financial assets which were considered past due and no adjustment for impairment was necessary.

The following table shows the credit quality of the Bank's on-balance sheet financial instruments. The ratings shown reflect the Bank's internal ratings expressed as equivalent external ratings. Gold and gold deposits 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 Bank's holdings of financial instruments are included in the table below at fair values, with the exception of gold deposits and very short-term financial instruments (cash and sight and notice accounts), which are shown at amortised cost. The table shows that the vast majority of the Bank's exposure is rated equivalent to A– or above.

**As at 31 March 2008**

Asset class / counterparty rating	AAA	AA	A	BBB	BB and below	Unrated	Fair value totals
<i>SDR millions</i>							
On-balance sheet exposures							
Cash and sight accounts with banks	22.7	12.0	1.6	0.5	–	–	36.8
Gold and gold deposits		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
Time deposits and advances to banks	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
<b>Total on-balance sheet exposures</b>	<b>46,309.2</b>	<b>176,723.4</b>	<b>54,389.9</b>	<b>49.0</b>	<b>1,090.4</b>	<b>10.7</b>	<b>278,572.6</b>
<i>Percentages</i>							
	17%	63%	20%	–	–	–	100%
Commitments							
Unsecured	304.6	–	–	–	–	–	304.6
Secured	180.0	531.0	4,087.1	713.0	952.0	–	6,463.1
<b>Total commitments by counterparty rating</b>	<b>484.6</b>	<b>531.0</b>	<b>4,087.1</b>	<b>713.0</b>	<b>952.0</b>	<b>–</b>	<b>6,767.7</b>
<b>Total exposure by counterparty rating</b>	<b>46,793.8</b>	<b>177,254.4</b>	<b>58,477.0</b>	<b>762.0</b>	<b>2,042.4</b>	<b>10.7</b>	<b>285,340.3</b>

## G. 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 model 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 own default experience. In the absence of internal default data, 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 of 31 March 2008 includes SDR 5,998.3 million for interest rate contracts and SDR 2,823.1 million for FX and gold contracts.

**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	0.01	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
<b>Total</b>	<b>281,560.2</b>				<b>11,715.2</b>

### H. Securitisation exposures

The Bank holds only highly rated securitisation exposures. 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' risk weights are used to determine the relevant risk weights. External credit assessment institutions used for determining the risk weights assigned to those exposures 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 2008**

SDR millions	External rating	Amount of exposures	Risk weight	Risk-weighted assets
Asset-backed commercial papers	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
<b>Total</b>		<b>3,374.0</b>		<b>674.8</b>

#### 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 incurs market risk primarily through the assets relating to the management of its equity. 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 125 tonnes (2007: 150 tonnes). These gold investment assets are held in custody or placed on deposit with commercial banks. At 31 March 2008 the Bank's gold position was SDR 2,247.0 million (2007: SDR 2,115.2 million), approximately 17% of its equity (2007: 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.

The Bank is exposed to interest rate risk principally through the interest bearing assets relating to the management of its equity. These assets are managed using a fixed duration benchmark of bonds. Limited interest rate risk also arises from accepting and reinvesting customer deposits.

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 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)	–
<b>Total</b>	<b>(6.7)</b>	<b>(29.0)</b>	<b>(69.0)</b>	<b>(45.9)</b>	<b>(60.7)</b>	<b>(71.2)</b>	<b>(175.1)</b>

**As at 31 March 2007**

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	(10.7)	5.8	(24.9)	(23.1)	(18.1)	(19.6)	(52.9)
Japanese yen	(0.3)	0.2	(4.8)	(5.7)	(6.7)	(6.3)	(13.3)
Pound sterling	(8.0)	8.3	(5.7)	(5.6)	(7.5)	(8.5)	(17.8)
Swiss franc	(0.8)	(0.6)	(0.4)	(0.7)	(0.6)	(0.9)	2.0
US dollar	(25.6)	(2.6)	(29.1)	(14.5)	(13.2)	(26.1)	(68.7)
Other currencies	(0.7)	(6.5)	(13.9)	(10.1)	(2.7)	(13.9)	(0.4)
<b>Total</b>	<b>(46.1)</b>	<b>4.6</b>	<b>(78.8)</b>	<b>(59.7)</b>	<b>(48.8)</b>	<b>(75.3)</b>	<b>(151.1)</b>

**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 2008**

<i>SDR millions</i>	SDR	USD	EUR	GBP	JPY	CHF	Gold	Other currencies	Total
<b>Assets</b>									
Cash and sight accounts with banks	–	9.3	14.5	2.1	–	4.7	–	6.2	36.8
Gold and gold deposits	–	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
Time deposits and advances to banks	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
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
<b>Total</b>	<b>860.2</b>	<b>81,645.9</b>	<b>119,002.1</b>	<b>22,069.9</b>	<b>42,546.7</b>	<b>1,046.6</b>	<b>31,520.5</b>	<b>5,020.7</b>	<b>303,712.6</b>
<b>Liabilities</b>									
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)
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)
<b>Total</b>	<b>(2,238.8)</b>	<b>(161,076.9)</b>	<b>(67,789.8)</b>	<b>(18,389.6)</b>	<b>(3,601.3)</b>	<b>(1,195.8)</b>	<b>(29,092.5)</b>	<b>(8,423.6)</b>	<b>(291,808.3)</b>
Net derivative financial instruments	71.6	84,238.4	(46,363.2)	(2,340.1)	(37,560.1)	(49.2)	(181.0)	3,382.3	1,198.7
<b>Net currency and gold position</b>	<b>(1,307.0)</b>	<b>4,807.4</b>	<b>4,849.1</b>	<b>1,340.2</b>	<b>1,385.3</b>	<b>(198.4)</b>	<b>2,247.0</b>	<b>(20.6)</b>	<b>13,103.0</b>
Adjustment for gold investment assets	–	–	–	–	–	–	(2,247.0)	–	(2,247.0)
<b>Net currency position</b>	<b>(1,307.0)</b>	<b>4,807.4</b>	<b>4,849.1</b>	<b>1,340.2</b>	<b>1,385.3</b>	<b>(198.4)</b>	<b>–</b>	<b>(20.6)</b>	<b>10,856.0</b>
SDR neutral position	1,307.0	(4,683.0)	(4,788.5)	(1,327.0)	(1,364.5)	–	–	–	(10,856.0)
<b>Net currency exposure on SDR neutral basis</b>	<b>–</b>	<b>124.4</b>	<b>60.6</b>	<b>13.2</b>	<b>20.8</b>	<b>(198.4)</b>	<b>–</b>	<b>(20.6)</b>	<b>–</b>

As at 31 March 2007

<i>SDR millions</i>	SDR	USD	EUR	GBP	JPY	CHF	Gold	Other currencies	Total
<b>Assets</b>									
<b>Cash and sight accounts with banks</b>									
–	10.0	56.0	1.1	–	2.5	–	22.8	–	92.4
Gold and gold deposits	–	–	–	–	–	–	15,434.3	23.3	15,457.6
Treasury bills	–	2,658.4	22,479.5	–	18,021.4	–	–	–	43,159.3
Securities purchased under resale agreements	–	1,087.2	54,235.8	5,594.7	272.1	–	–	–	61,189.8
Time deposits and advances to banks	73.4	72,844.2	724.7	15,419.0	2.8	936.6	–	1,233.1	91,233.8
Government and other securities	–	18,185.0	23,361.5	3,476.6	1,993.2	61.6	–	5,166.1	52,244.0
Accounts receivable	–	4,657.2	213.6	458.7	28.0	115.8	–	0.3	5,473.6
Land, buildings and equipment	188.0	–	–	–	–	–	–	–	188.0
<b>Total</b>	<b>261.4</b>	<b>99,442.0</b>	<b>101,071.1</b>	<b>24,950.1</b>	<b>20,317.5</b>	<b>1,116.5</b>	<b>15,434.3</b>	<b>6,445.6</b>	<b>269,038.5</b>
<b>Liabilities</b>									
<b>Currency deposits</b>									
Currency deposits	(2,006.3)	(138,444.1)	(46,372.0)	(22,781.6)	(3,381.4)	(1,068.0)	–	(7,745.3)	(221,798.7)
Gold deposits	–	(12.8)	–	–	–	–	(13,122.1)	–	(13,134.9)
Securities sold under repurchase agreements	–	(889.2)	(173.3)	–	–	–	–	–	(1,062.5)
Accounts payable	–	(1,118.8)	(17,772.5)	(132.2)	(280.6)	–	(182.7)	(97.3)	(19,584.1)
Other liabilities	–	(145.0)	(48.5)	–	–	(173.2)	–	(7.1)	(373.8)
<b>Total</b>	<b>(2,006.3)</b>	<b>(140,609.9)</b>	<b>(64,366.3)</b>	<b>(22,913.8)</b>	<b>(3,662.0)</b>	<b>(1,241.2)</b>	<b>(13,304.8)</b>	<b>(7,849.7)</b>	<b>(255,954.0)</b>
<b>Net derivative financial instruments</b>									
Net derivative financial instruments	118.5	46,066.1	(32,435.9)	(730.3)	(15,366.3)	(40.5)	(14.3)	1,410.5	(992.2)
<b>Net currency and gold position</b>	<b>(1,626.4)</b>	<b>4,898.2</b>	<b>4,268.9</b>	<b>1,306.0</b>	<b>1,289.2</b>	<b>(165.2)</b>	<b>2,115.2</b>	<b>6.4</b>	<b>12,092.3</b>
Adjustment for gold investment assets	–	–	–	–	–	–	(2,115.2)	–	(2,115.2)
<b>Net currency position</b>	<b>(1,626.4)</b>	<b>4,898.2</b>	<b>4,268.9</b>	<b>1,306.0</b>	<b>1,289.2</b>	<b>(165.2)</b>	<b>–</b>	<b>6.4</b>	<b>9,977.1</b>
SDR neutral position	1,626.4	(4,819.0)	(4,214.7)	(1,363.0)	(1,206.8)	–	–	–	(9,977.1)
<b>Net currency exposure on SDR neutral basis</b>	<b>–</b>	<b>79.2</b>	<b>54.2</b>	<b>(57.0)</b>	<b>82.4</b>	<b>(165.2)</b>	<b>–</b>	<b>6.4</b>	<b>–</b>

#### **D. Market risk VaR by risk type and in total**

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. Key figures of the Bank's exposure to market risk in terms of economic capital over the past two financial years are highlighted in the tables below:

**For the financial year ended 31 March**

SDR millions	2008				2007			
	Average	High	Low	At 31 March	Average	High	Low	At 31 March
Gold price risk	1,399.7	2,163.9	958.1	<b>2,116.1</b>	1,844.1	2,690.7	1,250.9	1,278.5
Interest rate risk	1,294.4	2,200.6	623.4	<b>2,187.0</b>	682.4	937.8	553.6	654.8
Foreign exchange risk	289.0	574.0	169.9	<b>519.3</b>	336.2	461.0	230.9	233.3
Correlation and diversification effects	(1,227.6)	(1,988.5)	(571.9)	<b>(2,132.7)</b>	(992.0)	(1,526.9)	(734.4)	(777.5)
<b>Total VaR</b>	1,755.5	2,950.0	1,179.5	<b>2,689.7</b>	1,870.7	2,562.6	1,301.0	1,389.1

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 Bank's minimum capital requirement for market risk and the related risk-weighted assets as of 31 March 2008 are shown in the table below:

**As at 31 March 2008**

SDR millions	Relevant VaR	Risk-weighted assets (A)	Minimum capital requirement (B)
Market risk (A) is derived as (B) / 8%	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 89% (2007: 91%) of its total liabilities. At 31 March 2008 currency and gold deposits originated from 152 depositors (2007: 152). Within these deposits, there are significant individual customer concentrations, with four customers each contributing in excess of 5% of the total on a settlement date basis (2007: 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 2008**

<i>SDR millions</i>	<i>Up to 1 month</i>	<i>1 to 3 months</i>	<i>3 to 6 months</i>	<i>6 to 12 months</i>	<i>1 to 2 years</i>	<i>2 to 5 years</i>	<i>5 to 10 years</i>	<i>Over 10 years</i>	<i>Total</i>
<b>Assets</b>									
Cash and sight accounts with banks	36.8	–	–	–	–	–	–	–	36.8
Gold and gold deposits	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 repurchase agreements	53,803.9	14,279.9	2,079.3	–	–	–	–	–	70,163.1
Time deposits and advances to banks	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
<b>Total</b>	<b>129,210.8</b>	<b>75,287.3</b>	<b>23,969.1</b>	<b>11,605.2</b>	<b>11,786.5</b>	<b>16,671.0</b>	<b>12,695.1</b>	<b>923.7</b>	<b>282,148.7</b>
<b>Liabilities</b>									
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)
<b>Total</b>	<b>(91,855.6)</b>	<b>(38,261.7)</b>	<b>(27,974.9)</b>	<b>(31,598.3)</b>	<b>(36,238.3)</b>	<b>(33,760.1)</b>	<b>(10,090.9)</b>	<b>(84.4)</b>	<b>(269,864.2)</b>
<b>Derivatives</b>									
<i>Net settled</i>									
Interest rate contracts	(59.6)	87.8	43.6	1,711.3	1,223.9	741.4	34.4	–	3,782.8
<i>Gross settled</i>									
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)
<b>Subtotal</b>	<b>(1,060.7)</b>	<b>(611.5)</b>	<b>13.7</b>	<b>64.0</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>(1,594.5)</b>
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)
<b>Subtotal</b>	<b>(19.2)</b>	<b>(36.3)</b>	<b>(40.1)</b>	<b>(143.5)</b>	<b>(76.0)</b>	<b>(195.0)</b>	<b>(282.8)</b>	<b>–</b>	<b>(792.9)</b>
<b>Total derivatives</b>	<b>(1,139.5)</b>	<b>(560.0)</b>	<b>17.2</b>	<b>1,631.8</b>	<b>1,147.9</b>	<b>546.4</b>	<b>(248.4)</b>	<b>–</b>	<b>1,395.4</b>
<b>Total future undiscounted cash flows</b>	<b>36,215.7</b>	<b>36,465.6</b>	<b>(3,988.6)</b>	<b>(18,361.3)</b>	<b>(23,303.9)</b>	<b>(16,542.7)</b>	<b>2,355.8</b>	<b>839.3</b>	<b>13,679.9</b>

As at 31 March 2007

<i>SDR millions</i>	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
<b>Assets</b>									
Cash and sight accounts with banks	92.4	–	–	–	–	–	–	–	92.4
Gold and gold deposits	12,011.9	115.5	60.4	205.3	1,008.6	1,609.0	333.2	–	15,343.9
Treasury bills	13,913.7	16,142.5	7,616.5	5,513.1	–	2.4	–	–	43,188.2
Securities purchased under repurchase agreements	32,709.7	4,553.5	6,750.3	–	–	–	–	–	44,013.5
Time deposits and advances to banks	29,884.2	23,350.6	22,574.6	15,926.7	534.9	–	–	–	92,271.0
Government and other securities	2,315.2	6,133.8	4,278.1	8,291.5	11,156.9	13,387.8	12,371.4	972.1	58,906.8
<b>Total</b>	<b>90,927.1</b>	<b>50,295.9</b>	<b>41,279.9</b>	<b>29,936.6</b>	<b>12,700.4</b>	<b>14,999.2</b>	<b>12,704.6</b>	<b>972.1</b>	<b>253,815.8</b>
<b>Liabilities</b>									
Currency deposits									
Deposit instruments repayable at 1–2 days' notice	(8,073.2)	(11,707.8)	(23,952.7)	(34,078.5)	(25,290.4)	(28,253.5)	(7,997.8)	–	(139,353.9)
Other currency deposits	(48,814.3)	(11,830.0)	(11,050.30)	(15,528.1)	(4.7)	–	–	–	(87,227.4)
Gold deposits	(11,965.5)	(28.3)	(56.7)	(73.2)	(14.3)	(889.4)	(120.1)	–	(13,147.5)
Securities sold under repurchase agreements	(961.7)	(103.7)	–	–	–	–	–	–	(1,065.4)
Securities sold short	(0.3)	–	–	–	–	(41.5)	(7.9)	(92.8)	(142.5)
<b>Total</b>	<b>(69,815.0)</b>	<b>(23,669.8)</b>	<b>(35,059.7)</b>	<b>(49,679.8)</b>	<b>(25,309.4)</b>	<b>(29,184.4)</b>	<b>(8,125.8)</b>	<b>(92.8)</b>	<b>(240,936.7)</b>
<b>Derivatives</b>									
<i>Net settled</i>									
Interest rate contracts	78.6	(350.3)	(263.3)	(132.9)	269.6	291.2	50.4	(4.3)	(61.0)
<i>Gross settled</i>									
Exchange rate and gold price contracts									
Inflows	45,092.9	17,810.5	920.4	3,349.8	239.1	134.5	–	–	67,547.2
Outflows	(45,324.5)	(17,824.2)	(906.4)	(3,270.3)	(238.4)	(134.5)	–	–	(67,698.3)
<b>Subtotal</b>	<b>(231.6)</b>	<b>(13.7)</b>	<b>14.0</b>	<b>79.5</b>	<b>0.7</b>	<b>0</b>	<b>–</b>	<b>–</b>	<b>(151.1)</b>
Interest rate contracts – gross settled									
Inflows	223.6	144.8	578.4	637.9	967.2	1,297.5	1,454.2	–	5,303.6
Outflows	(307.4)	(159.5)	(649.7)	(771.0)	(1,031.0)	(1,336.1)	(1,559.5)	–	(5,814.2)
<b>Subtotal</b>	<b>(83.8)</b>	<b>(14.7)</b>	<b>(71.3)</b>	<b>(133.1)</b>	<b>(63.8)</b>	<b>(38.6)</b>	<b>(105.3)</b>	<b>–</b>	<b>(510.6)</b>
<b>Total derivatives</b>	<b>(236.8)</b>	<b>(378.7)</b>	<b>(320.6)</b>	<b>(186.5)</b>	<b>206.5</b>	<b>252.6</b>	<b>(54.9)</b>	<b>(4.3)</b>	<b>(722.7)</b>
<b>Total future undiscounted cash flows</b>	<b>20,875.3</b>	<b>26,247.4</b>	<b>5,899.6</b>	<b>(19,929.7)</b>	<b>(12,402.5)</b>	<b>(13,932.6)</b>	<b>4,523.9</b>	<b>875.0</b>	<b>12,156.4</b>

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:

<b>Written options</b> <i>SDR millions</i>	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
<b>As at 31 March 2008</b>	(0.9)	(11.3)	(9.7)	(94.3)	(5.3)	–	–	–	(121.5)
As at 31 March 2007	(8.5)	(9.7)	(3.1)	(46.5)	(0.1)	–	–	–	(67.9)

The table below shows the contractual expiry date of the credit commitments as at the balance sheet date:

<b>Contractual expiry date</b> <i>SDR millions</i>	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
<b>As at 31 March 2008</b>	243.7	466.3	–	4,212.7	–	–	–	1,845.0	6,767.7
As at 31 March 2007	66.0	330.4	–	4,815.4	–	–	–	2,000.0	7,211.8

## 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, the Bank has adopted an approach that is consistent with the advanced measurement approach proposed under the Basel II Framework for the calculation of operational risk-weighted assets and the measurement of operational risk economic capital. 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.

In line with the assumptions and key parameters of the Basel II Framework, the calculation of the minimum capital requirement for operational risk does not take reputational risk into account and is determined assuming a 99.9% confidence interval and a one-year time horizon. In quantifying its operational risk the Bank does not take potential protection it may obtain from insurance into account.

Consistent with the parameters used in the calculation of economic capital for financial risk, the Bank also measures economic capital for operational risk to the 99.995% confidence interval assuming a one-year holding period.

The table below shows the minimum capital requirement for operational risk and the related risk-weighted assets as of 31 March 2008:

### As at 31 March 2008

SDR millions	VaR	Risk-weighted assets (A)	Minimum capital requirement (B)
Operational risk, where (A) is derived as (B) / 8%	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 (pages 192–249) of the Bank for International Settlements. These financial statements incorporate the balance sheet as at 31 March 2008, profit and loss account for the year then ended as required by the Bank's Statutes, and the 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 2008 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

Dr Philip Göth

Zurich, 5 May 2008

Pavel Nemecek

## Five-year graphical summary

