G-20 STUDY GROUP
ON GLOBAL CREDIT MARKET DISRUPTIONS

Paper Prepared by Australia
1 EXECUTIVE SUMMARY

The period of financial turmoil that began in August 2007 has been marked by ongoing credit market strains in the developed economies. At the time of writing, more than a year on from the start of these events, financial markets were facing renewed stress and many governments were taking unprecedented steps to stabilise the financial system. In response to the financial turmoil, G-20 Deputies, at their meeting in March 2008, set up a Study Group to report on the global credit market disruptions. This report brings together the contributions of Study Group members and draws on important work undertaken in other international fora, including, among others, the work of the Financial Stability Forum (FSF), the International Monetary Fund (IMF), the European Union (EU), the Japan Financial Services Agency and agencies of other G-20 member countries. It is differentiated from these other reports in a number of respects, most particularly in providing a more global perspective of the crisis, taking advantage of the broader composition of the G-20 Group. Greater attention is given in this report to the transmission of the effects of the financial crisis around the world, and in particular providing some perspective on the effects on emerging market and newly industrialised economies (EMEs used as the abbreviation for both).

The Unfolding of Financial Turmoil in Developed Economies

The background to the recent financial turmoil was a period of relatively low interest rates around the world (in both nominal and real terms) associated with abundant global savings, a global ‘search for yield’ in financial markets, and what is now recognised to have been a general underpricing of credit risk. In a number of countries, these conditions provided the impetus for very strong credit growth and led to some domestic imbalances, most notably in housing markets. Financial market developments, particularly the growing importance of the ‘originate and distribute’ mortgage model and of structured finance products, facilitated a general increase in risk-taking. Lending standards fell and credit quality deteriorated. In the United States (US) subprime housing market, banks lent on easy terms, while borrowers, for their part, were lured by low ‘teaser’ interest rates. When these teaser rates were reset, poor credit histories started to be exposed, particularly when the housing market stalled and house prices began to flatten and fall. This led to rising defaults in this segment of the market. As losses began to accumulate, it operated to uncover more broad-based and deep-seated problems in developed economy financial systems around the globe.

In the first part of 2007, financial institutions and other entities involved in the securitisation of subprime housing loans came under financial pressure. Liquidity in the mortgage-related securities markets largely dried up. Financial institutions, notably investment banks, not all of which were domiciled in the US, were exposed through lines of credit extended to the securitisation entities. By mid year, problems arising from subprime loans were starting to intensify and negative news appeared to be accumulating. Increasing global integration of credit markets had meant that there were significant offshore exposures to subprime housing loans, particularly in Europe. The negative news – coming from both the US and Europe – included announcements of substantial losses by large investment firms, downgrades of speculative-grade securities with exposures to subprime loans and rising concerns about the future viability of some financial institutions. In early August, these culminated in a marked adverse shift in investor sentiment.

The already difficult conditions in mortgage-related securities markets intensified, and some of these markets seized up entirely. Losses started to be revealed in unexpected places, and the crisis started to spill across credit markets, affecting commercial mortgage and leveraged buyout deals as well. A key driver of market developments was that there was a lot of uncertainty about the size and the location of exposures and market participants became concerned about counterparty risk. This uncertainty was a product of the lack of clear disclosure by banks of their exposures to affected assets, and

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1 This report was finalised on 31 October, with data up to 30 October 2008.
was compounded by the complexity of some of these securities, which meant that underlying exposures were often obscured. Banks were faced with an unexpected expansion of their balance sheets as loans previously held in off-balance sheet entities were brought back onto balance sheets. As a result, conditions in interbank credit markets became strained, and banks turned to their central banks for liquidity. These strains initially reached a peak in September 2007, but there has since been a number of further waves where tensions have risen as more losses have been revealed. Over the past two months, these tensions have reached new heights, prompting large-scale government intervention from a number of countries in a coordinated effort to stabilise financial markets.

In 2008, the financial turmoil has been weighing on real activity in the major developed economies and, more recently, has been spilling over to EMEs. These real effects have become more broad-based, and the standard feedback mechanisms between the real and financial sectors as an economy starts to slow are becoming evident. Lending standards have been tightened and credit is being rationed. At the same time, many borrowers still face elevated interest rates despite monetary policy easings. In turn, banks face concerns about further deterioration in credit quality of their borrowers in a slowing economy.

From September 2008, global financial markets have faced further significant upheaval. In early September, the two large US Government Sponsored Entities (GSEs), Fannie Mae and Freddie Mac, were taken into conservatorship by the US government. A number of large financial institutions in the US and Europe collapsed or nearly collapsed, denting market confidence. This led to a rise in global risk aversion, with contagion effects to equity markets across the globe. Concerns about counterparty risk were reignited, once again leading to dislocation in interbank markets, particularly for term funding. Further weakness in financial institutions, notably in the US and Europe, resulted in some nationalisations. In at least one case, this led to sharp downward pressure on the currency and forced the government to seek funding from external sources. By early October, a large number of governments – primarily among developed economies – had undertaken substantive measures in an attempt to restore market confidence and provide market liquidity where it was needed. In mid October, EU leaders agreed on a coordinated framework for national interventions. The measures included provisions for the purchase of granting of guarantees for refinancing instruments of banks, purchases of equity stakes in financial institutions and of troubled assets, as well as increased depositor protection. Some central banks undertook coordinated rate cuts and some governments employed macroeconomic policy measures to bolster their real economy in response to slowing global growth.

**Causes of the Financial Turmoil in Developed Economies**

In understanding the causes of the crisis, it is useful to distinguish between those factors that contributed to rising defaults in the US subprime sector and those that saw losses amplified and spread more widely. In the first category are: regulatory gaps that encouraged the increased use of securitisation and the spread of the ‘originate and distribute’ mortgage model and the consequent adverse incentives that resulted in insufficient attention being paid to credit quality; and weaknesses in risk management systems and regulatory oversight that saw these lending practices continue even as credit quality continued to decline and risk exposures build.

The factors that contributed to these losses being amplified and/or spread more widely include high levels of leverage in the system, including insufficient capital held against loans that were being originated. This in turn was partly a product of failings in the regulatory system to apply adequate risk capital to the off-balance sheet entities that securitise loans on behalf of the banks. There were serious weaknesses in risk management systems, including weaknesses in aggregating exposures across all business activities, inadequacies in bank stress testing and insufficient appreciation of the importance of market liquidity risk. Another source of weakness was a lack of transparency inherent in complex structured finance products, and in the over-the-counter market, that contributed to market liquidity drying up. The complex nature of structured finance products also resulted in some investors having an over-reliance on
credit ratings instead of undertaking adequate due diligence. This complexity also meant that exposures to subprime lending were difficult to determine, which contributed to difficulties in assessing counterparty risks. In addition, as markets deteriorated, concern regarding estimates of the fair value of assets rose. In the absence of market trades, financial institutions had to employ models to estimate the fair value of assets. In cases where markets were still functioning, significant drops in asset values led to concerns that paper losses being realised on the books of financial institutions were far steeper than the adjusted expected income stream of the underlying assets. Furthermore, weaknesses in accounting rules meant that off-balance sheet entities did not require clear and transparent disclosure. Finally, there was an array of shortcomings in credit rating agencies and weakness in monoline insurers.

**Transmission to Emerging Market Economies**

There were initially few spillovers to EMEs from the financial turmoil occurring in developed economies. They had only very limited exposure to subprime mortgages, and with most EME economies growing strongly, they were able to retain the confidence of international investors. Some spillover effects were evident in EME financial markets, reflecting the relative integration of such markets in the global financial system. Initially, these effects were relatively modest; however, as financial market upheaval in developed economies has persisted, EME financial markets have come under more significant pressure, and volatility has increased. There have been four principal developments in EME financial markets over this period: a rise in the price of risk, along with a rise in risk aversion; a sell-off in equity markets; pressure on currencies and some reduction in external financing. These developments have not generally been uniform across countries, with markets recognising differences among EMEs. However, these effects have generally become more severe since financial turmoil intensified in developed economies in September.

Other potential financial transmission channels of the financial turmoil in developed economies have been identified. EMEs may have some direct exposures to losses from investments in financial institutions in developed economies, but at this stage they do not seem to have affected EMEs in any significant way. Also, many of these countries have a significant foreign bank presence and therefore might be vulnerable to financial stress faced by a parent bank. Some EMEs are also significant recipients of remittances from migrants in developed economies, which might be scaled back in an economic slowdown. Furthermore, while banking sectors in most EMEs remain sound, a decline in investor confidence has led to fears of bank vulnerability in some EMEs.

EMEs are also being affected through real channels as well as through financial channels. Most EMEs retain substantial trade linkages with developed economies. For example, in Asia, while intra-regional trade has been growing rapidly over recent years, much of this activity is still driven by developed economies as a major destination for final goods. Accordingly, export growth in the region, and elsewhere, has slowed.

In response to these developments, a range of policy measures are being implemented by EMEs to address slowing growth and ease emerging strains in their financial markets. These measures include central banks easing monetary policy settings, and in some cases, injecting liquidity into interbank markets and broadening domestic market operations, where needed. Other measures include deposit guarantees.

Some country-specific concerns exist among EMEs, particularly among countries that have a heavy reliance on external financing. Furthermore, a small number of, generally smaller, EMEs facing potential or actual financing difficulties have approached the IMF for a Stand-by Arrangement or are exploring other financing options.

In understanding these effects on EMEs, it is also important to consider that the effects of the recent financial turmoil on EMEs have been rather diverse. Sometimes the examination of regional EME aggregates can be somewhat misleading and further effort might be required to correctly identify the important differences.

EMEs have overall shown greater resilience, thus far, to the recent financial turmoil than they have during previous crisis episodes. This may in part be a testimony to the reforms
that have been undertaken since the Asian financial crisis in the 1990s. Among other things, these reforms include more credible policy frameworks, better structuring of banking sector debt and improvements in fiscal positions. Some EMEs also hold large foreign reserves, particularly in Asia, that provide a degree of protection against risks of a sudden withdrawal of capital.

**Policy Issues**

The financial crisis has presented unforeseen and difficult circumstances, requiring innovative and decisive action by governments. Governments in many developed economies are now faced with the challenge of addressing weaknesses in financial institutions, stresses in financial markets and a slowing global economy. Bold steps have been taken by governments and further innovative steps may be required as new challenges emerge.

The financial turmoil has provided an opportunity for all countries to reassess the robustness of their financial and economic systems. A range of recommendations have been formulated for addressing these identified weaknesses, particularly over the short to medium term, such as those found in recent reports of the FSF and other national and international bodies.

Recommendations have been put forward to improve: regulation and prudential oversight; risk management practices; standards for valuations and disclosures; market structures and products; credit ratings and the practices of credit rating agencies; the response of central banks and government authorities to weak and failing banks; and international cooperation and coordination. Implementation of the various recommendations will be an important challenge in the period ahead. At this stage, this broad set of recommendations is of most immediate relevance to developed economies, with recommendations related to good prudential regulation of the banking sector likely to figure most prominently for EMEs. However, more of these other issues are likely to be of increasing relevance for EMEs in the future. In turn, this may pose some broader questions for EMEs, particularly for those seeking to liberalise their capital markets, such as how to best benefit from financial liberalisation while safeguarding domestic financial systems. While some of these questions are posed briefly in the body of the report, addressing these complex matters in any depth was beyond the scope of the Study Group.

The financial crisis has tested the ability of central banks and other relevant authorities in responding to financial stress and in addressing weak or failing banks. Central banks have needed to develop new tools to effectively provide liquidity to the market where it has been most needed. They have found it necessary to work in concert at times. The procedures for dealing with weak and failing banks have come under review across a range of countries.

**International Cooperation and Coordination**

As financial institutions and markets are becoming more global in nature, international authorities – both policy makers and supervisors – are increasingly required to take a coordinated approach in order to deal effectively with episodes of financial stress. Some aspects that have been highlighted by recent events include the provision of liquidity across international markets, and the potential cross-border issues that may arise when financial institutions with international operations come under financial stress or fail. Other forms of international cooperation aimed at providing support to the financial system and bolstering economic growth have included coordinated rate cuts and fiscal packages.

A further question arising from recent events is how the relevant international bodies such as the FSF, IMF and G-20 should coordinate their efforts. The FSF and IMF have agreed to closer coordination of their efforts. The IMF has agreed to report its findings on financial stability risks to FSF meetings, and in turn will seek to incorporate relevant FSF findings into its surveillance work. The G-20, which brings together systemically important economies, is also well positioned to play an important role in promoting global financial stability.
2. GLOBAL CREDIT MARKET DISRUPTIONS: CAUSES AND SPILLOVERS

2.1 Introduction

In mid 2007, the financial system in most developed economies came under significant stress. Now more than a year later, financial markets are facing renewed stress and many governments are taking unprecedented action to stabilise the financial system. At the centre of the initial financial turmoil were rising defaults in the United States (US) subprime housing market, which ultimately provided the trigger for financial upheaval across a broader range of markets, as more deep-seated weaknesses in the financial system were uncovered.

Initially, the fallout from rising subprime loan defaults was mainly confined to those financial markets and institutions most directly exposed to subprime loans. The mortgage-backed securities market stopped operating effectively, as liquidity dried up and pricing became difficult. However, in August 2007, after a string of negative news announcements, investor sentiment deteriorated markedly and financial turmoil, very rapidly, became widespread and more severe. Risk was reassessed and repriced across a broader range of assets. Asset-backed security and commercial paper markets faced difficult conditions and some seized up entirely. High leverage further exacerbated pressures within the system and losses were amplified. Uncertainty about the extent and location of subprime losses led to funding liquidity becoming scarce in interbank markets, particularly in the US and Europe, as banks became concerned about counterparty risks.

A broader set of weaknesses within financial markets was now being recognised, including difficulties in risk management structures, problems in valuing assets during financial stress, inadequacies in disclosure requirements, in stress testing and supervision, and further contagion effects through the operations of credit rating agencies and ‘monoline’ insurers.

Global losses arising from US loans and related securities were estimated by the International Monetary Fund (IMF), in the October 2008 Global Financial Stability Report, to reach US$1.4 trillion (Figure 1), with around US$725-820 billion expected to be borne by the global banking system. An alternative estimate produced by the Bank of England (BoE) suggests combined mark-to-market losses across the US, the euro area and the UK have reached US$2.8 trillion. At the end of October 2008, US$690 billion

Figure 1

<table>
<thead>
<tr>
<th>Country/Period</th>
<th>Bank losses (LHS)</th>
<th>Other financials (LHS)</th>
<th>Percent of GDP (RHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US savings and loans (1986-95)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan banking crisis (1990-99)</td>
<td>500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia banking crisis (1998-99)</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-prime crisis (2007-present)</td>
<td>1200</td>
<td>1000</td>
<td>35%</td>
</tr>
</tbody>
</table>

All costs are in real 2007 dollars. Asia includes Indonesia, Korea, the Philippines, and Thailand.

Source: IMF

2 The IMF estimates are based on market prices and therefore may be affected by any liquidity or uncertainty discounts included in these prices.
of losses to the global banking system had been realised, although, offsetting this, around the same amount of new capital had been raised, including that provided by governments. These overall losses are large in dollar terms when compared to some previous financial crises, but more modest as a per cent of GDP, particularly when it is recognised that a significant proportion of these losses will be borne by participants located outside of the US.

The emerging market and newly industrialised economies (EMEs used as the abbreviation for both) initially showed substantial resilience to the recent financial turmoil and the rise in global risk aversion, up until around mid 2008. Their direct exposures to subprime losses and complex financial instruments were limited, and with most EME economies growing strongly, they were able to retain the confidence of international investors. Some spillover effects were evident in EME financial markets, reflecting the relative integration of such markets in the global financial system. Initially, these effects were relatively modest; however, as financial market upheaval in developed economies has persisted, EME financial markets have come under more significant pressure, and volatility has increased. With financial turmoil in developed economies becoming more protracted, the potential for its effects to spread more widely to EMEs is rising, through both financial channels (such as tighter external funding conditions and direct exposures to financial institutions in developed economies facing financial stress) and real channels (i.e., slower global growth). There is growing evidence that both of these effects are having an impact on EME growth. Furthermore, in an environment of slowing growth and deepening financial stress, both EMEs and developed economies face a more challenging policy environment in the period ahead.

This section of the report outlines a broad chronology of events with a view to identifying the causes of this financial turmoil. In understanding these causes, it is useful to distinguish the factors that contributed to rising defaults in the US subprime housing market and those that saw these effects amplified and spread more widely, resulting in broader dislocation in financial markets. Previous work has already been undertaken in other international fora, identifying causes and potential solutions to the crisis. Most prominently, the FSF undertook work on these issues, commissioned by G7 Finance Ministers and Central Bank Governors, and published a 'Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience' in April this year (and a follow-up report was published in October). Similar work has also been undertaken by the EU Commission, which has outlined a roadmap for work to be undertaken in response to the crisis.3 The IMF has analysed these issues in much detail in their many reports. The discussion in this report draws on the findings in these and other documents.

2.2 The Unfolding of Events

The global environment

The 2007-08 financial crisis followed a run of years where macroeconomic and financial volatility was low, and growth was strong and relatively stable. Interest rates were at low levels, in both nominal and real terms, and credit became widely available on easy terms. Risk appeared to be in retreat. There was an overconfidence that good times could continue, and this played out in a loosening in the loan underwriting standards of mortgage originators and banks, in the ratings of the credit rating agencies and in a general underpricing of risk. In this environment, investors, which included a growing pool of institutional funds, engaged in a search for yield. Their strategies included investing in riskier assets and increasing the effective leverage on their investments. New structured credit products became available to satisfy this search for yield. These

3 The FSF reports can be found at:
The EU roadmaps can be found at:
structured products seemingly offered up higher returns without a need to accept higher risk. However, the presumption that such a ‘free lunch’ might be on offer was ultimately shown to be flawed. The factors discussed here – low interest rates, a search for yield and freely available credit – worked together in the US (and elsewhere) to feed an asset boom in housing associated with declining credit quality and rising leverage, setting the scene for the events that were to follow.

While the US subprime housing market appears as a centrepiece in this crisis, it was by no means the only source of vulnerability to result from these factors. An increased appetite for risk was evident in a variety of activities, for which leveraged buyouts and carry trade activities are some other examples. In the global context, a build-up in global imbalances may have also made the global financial environment more fragile, contributing to the factors that brought about the crisis (such as by contributing to low global interest rates) and potentially making dealing with the after-effects of this financial turmoil more difficult.

**US subprime housing market**

The trigger for the financial turmoil was rising defaults in the US subprime housing market. Traditionally, the bulk of housing loans in the US mortgage market were made to prime borrowers, who had good credit histories and were able to meet other specific lending criteria, such as good income documentation and modest loan-to-valuation ratios. However, over recent years, lending to subprime borrowers – typically borrowers with an impaired credit history – expanded at a rapid pace. By 2006, subprime loans had reached around one-fifth of annual mortgage originations and represented an estimated 15 per cent of all outstanding mortgages.

Both demand and supply factors were important in producing the boom in subprime lending. On the demand side, housing affordability had improved, primarily reflecting low interest rates and a change in federal US taxation law that had increased the attractiveness of home equity loans. On the supply side, funds available for lending to the subprime market expanded reflecting two significant developments around this time: 1) a shift in the business model in the mortgage market, whereby loans, and the associated risks, were increasingly taken off the balance sheet and securitisation increasingly used to tap funds in the wholesale market; and 2) rapid financial innovation in products that enhanced the attractiveness of home loans to a broader range of investors. As a result, many households who had not previously been eligible for a home loan were now able to access credit.

The new mortgage model fundamentally changed the US mortgage market (Figure 2). Securitisation itself wasn’t new, since up to this point, most prime loans in the US were being onsold to Government Sponsored Entities (GSEs) – Fannie Mae and Freddie Mac – which would securitise the loans (and indeed had pioneered this process). However, what was new was the extension of securitisation to subprime loans and the more intimate involvement of the financial institution in the process. This stood in contrast to the traditional ‘originate and hold’ mortgage model, whereby loans that were not suitable to be onsold to the GSEs were then held on the banks’ books. It applied mainly to subprime loans, but also to a greater share of prime loans from around 2003 when GSEs faced some constraints in their ability to purchase these loans. At the time, this was regarded as a welcome development, on the basis that credit risk was effectively transferred in the process and dispersed to a broader range of investors willing to hold that risk.

The originate and distribute mortgage model entailed an important shift in incentives facing financial institutions. Financial institutions became engaged in operating a volume-based, fee-based business, and became less concerned about the quality of the loans they originated, with that risk now seemingly borne by outside investors. These trends were reinforced by increased competition in the mortgage market as mortgage brokers became more active, and thinly capitalised mortgage originators became more prevalent. Accordingly, loan quality and underwriting standards deteriorated. Many subprime borrowers were enticed by low ‘teaser’ interest rates that expired after two years, at which time rates were reset, typically to a much higher adjustable rate. ‘Risk layering’
was also a common feature, whereby poor credit history would be combined with a high loan-to-valuation ratio or low income documentation.

**Figure 2**

**Traditional Mortgage Model**

![Traditional Mortgage Model Diagram]

**Originate and Distribute Mortgage Model**

![Originate and Distribute Mortgage Model Diagram]

Source: Reserve Bank of Australia

The second key development in the mortgage market was rapid financial innovation in products that could attract additional demand from investors, most particularly structured finance products (see Box A). These products were developed particularly to comply with the investment rules of some large institutional funds that restricted investment in sub-investment grade securities. It involved carving the debt up into various risk segments, and adding credit enhancements as required (such as subordination and over-collateralisation) to achieve a desired rating. Credit rating agencies became closely involved with firms in the structuring of their debt, raising questions about conflicts of interest. By this process, at least 80 per cent of subprime mortgages could be resold to institutional investors, while the higher risk tranches proved attractive to some hedge funds and other investors seeking higher yields. Securities that weren’t met with significant investor interest could be further rebundled, restructured, credit re-enhanced and reoffered up to the market.

As the credit quality of loans deteriorated, lending continued, in part because investors were somewhat insulated from losses while housing prices were still on the rise. Also, as the securities had become increasingly complex, the underlying exposures became more opaque and some risks went underappreciated. Instead of undertaking due diligence, some investors relied too heavily on credit ratings. The assumptions standing behind these credit ratings would turn out to have been too optimistic. In addition, some investors had little appreciation of the steep loss profiles some of these products entailed in the event of increased defaults on the underlying loans (see Box A for details). The compensation schemes of employees in investment firms often rewarded short-term returns, with little downside when future losses were realised. Some blame has also been attributed to risk management systems. For financial institutions and many investors, they underestimated their exposures to the subprime market and their stress testing exercises proved to be inadequate.

During 2006, defaults on subprime mortgages started to pick up and by mid 2007, the default rate had reached its previous peak and was still on the rise. Delinquency rates were rising in each successive origination year, primarily reflecting a substantive weakening in standards over 2005-2007 (Figure 3). Poor quality risk was exposed as
Increasingly over recent years, securitisation has been used to finance residential mortgages and other loans. In the US, the Government Sponsored Entities (GSEs), Freddie Mac and Fannie Mae, have traditionally dominated this market, having pioneered the securitisation process in the 1970s. However, over more recent years, growth in the US has been driven to a large part by increased use of securitisation by private financial firms. Securitisation has also expanded as new products have been brought onto the market. These products have been designed to more effectively tap the potential pool of funds available to be invested by better tailoring products to match the risk profiles of various investors. This has seen securitisation products expand from the standard mortgage-backed securities (MBS) or, more generally, asset-backed securities (ABS), to include a range of structured finance products, including structured MBS and ABS and collateralised debt obligations (CDOs). This box outlines the main features of these structured finance products.

In the simplest case, an MBS is a security that represents a claim on a pool of mortgages, where payments to investors are made out of the loan repayments being made. In more complex cases, MBS are structured into risk tranches. This division into subordinated tranches, along with other credit enhancements, enables the upper tranches to obtain high ratings. This in turn attracts funds from large institutional investors, who are often required to purchase securities with high ratings in order to satisfy internal investment rules. The lower tranches have proven appealing to some other investors, such as hedge funds seeking out higher yields. The strategy, then, is to find the right way to carve up the debt, and as necessary apply other ‘credit enhancements’ in order to achieve desired credit ratings. Credit rating agencies became intimately involved in helping financial firms to do this, and this led to concerns that credit rating agencies may face significant conflicts of interest. Concerns were also raised about the methodologies used by credit rating agencies in providing this advice.

In a simple three-tranche example, the structure for the security might include (in order of increasing risk) a senior, a mezzanine and an equity tranche. Risk and returns are lowest for the senior tranche, and accordingly, it has the highest credit rating. The lower risk for the higher tranches is achieved in part through subordination, whereby losses are first absorbed by the lowest tranches. This means that the lower tranches must be entirely wiped out before any losses are incurred on more senior tranches. For example, if a senior tranche benefits from 20 per cent subordination, no losses would be incurred on the senior tranche until losses exceeded 20 per cent. This level of subordination was not uncommon and, since such losses exceed recent historical experience, these senior tranches were considered to be almost risk free. Other credit enhancements often included overcollateralisation (where the asset backing exceeds the MBS issuance) or excess spread (where the expected income stream exceeds the payments committed under the MBS contract and is retained to meet future losses). Further protection could be obtained through bond insurance from a monoline insurer (so-called credit wrapping).

If some of these securities weren’t met with sufficient investor interest, MBS were bundled up again, along with other securities and loans, into a CDO. The debt was once again carved up and further credit enhancements were applied and, with the right structure, high-rated debt was once again created from seemingly low quality collateral. However, in the process, the underlying asset exposures became more opaque and investors increasingly relied on credit ratings to assess credit quality. The process of rebundling and restructuring could be repeated multiple times to produce CDO squared, CDO cubed and even higher. This created the so-called Matryoshka or ‘Russian Doll’ structure shown in Figure A1. Another development was synthetic CDOs, whereby exposures were created synthetically by the use of derivates (such as credit default

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1. Asset-backed commercial paper (ABCP) is another means by which funds can be raised to finance mortgages and other loans. ABCP is primarily short-dated paper and is typically backed by a broad range of loan assets, including loan receivables, but in the US at least, it is less significant in terms of raising financing for mortgages. The ABCP market was significantly affected in the fallout from the crisis (as discussed in the text).
swaps) written on the assets rather than physically holding the assets themselves. This meant that exposure to subprime risk could be created in an almost unlimited way.

**Figure A1: Structured Finance Products: Matryoshka ‘Russian Doll’ Structure**

<table>
<thead>
<tr>
<th>AAA (80%)</th>
<th>Collateralised debt obligations (CDOs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA (11%)</td>
<td>High Grade CDO</td>
</tr>
<tr>
<td>A (4%)</td>
<td>Senior AAA (6%)</td>
</tr>
<tr>
<td>BBB (3%)</td>
<td>Junior AAA (6%)</td>
</tr>
<tr>
<td>Unrated</td>
<td>AA (1%)</td>
</tr>
<tr>
<td></td>
<td>BBB (1%)</td>
</tr>
<tr>
<td></td>
<td>Unrated (1%)</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>BBB (3%)</th>
<th>Mezzanine CDO</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBB (2%)</td>
<td>Junior AAA (7%)</td>
</tr>
<tr>
<td>A (3%)</td>
<td>AA (6%)</td>
</tr>
<tr>
<td>BBB (2%)</td>
<td>Unrated (10%)</td>
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</tbody>
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<table>
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<tr>
<th>CDO Squared</th>
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<tbody>
<tr>
<td>Senior AAA (6%)</td>
</tr>
<tr>
<td>Junior AAA (6%)</td>
</tr>
<tr>
<td>A (3%)</td>
</tr>
<tr>
<td>BBB (2%)</td>
</tr>
<tr>
<td>Unrated (10%)</td>
</tr>
</tbody>
</table>

While higher-rated tranches are relatively protected from rising default rates, the lower-rated tranches can face very steep loss profiles, once losses start to be incurred. As explained above, this reflects the fact that each tranche fully absorbs all losses above a particular default rate until the tranche is entirely wiped out. When the CDO (or CDO squared) is in turn itself underpinned by structured debt, this effect compounds and the loss profiles become very steep indeed. Steep profiles are possible even for the highest rated products, depending on the composition of the structured debt backing the CDOs. (Figure A2 shows some stylised examples of loss profiles broadly reflecting the structure shown in Figure A1, but assuming no other credit enhancements were in place.)

**Figure A2**

<table>
<thead>
<tr>
<th>Losses on underlying portfolio - %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Furthermore, the ratings assigned by credit rating agencies to the various tranches of debt proved to be very sensitive to assumptions made about the events that might affect default and loss rates and the extent to which these events might be correlated. Small changes in assumptions about these correlations could significantly affect credit rating agencies’ assessments of the probability of default. This made these products particularly sensitive to multiple notch downgrades in credit ratings, which is what occurred when losses started to mount. In this context, various concerns have been raised about the credit ratings assigned to these products, including the models used to arrive at the ratings and the use of the corporate bond ratings scale, which is not subject to issues of such sensitivities. See Section 3.1 for further discussion of the issues related to credit rating agencies.
house prices started to flatten and fall in some regions and teaser rates were reset, lifting mortgage repayments for the affected households by 50 per cent or more. Falls in house prices eroded collateral values, further exposing lenders to the risk of loss, limiting further housing equity withdrawal for consumption, and marking an end to the cycle of refinancing mortgages whenever an interest rate reset was due to occur. Interest resets will remain high through the second half of 2008, though they will decline substantially in 2009 (Figure 4).

**Figure 3**

US Subprime Delinquencies by Vintage

<table>
<thead>
<tr>
<th>Percentage of issuance, by date of loan tranche (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>Months from origination</td>
</tr>
</tbody>
</table>

Source: BIS

**Figure 4**

US - Mortgages to Reset Interest Rate

<table>
<thead>
<tr>
<th>Monthly US$bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>M</td>
</tr>
</tbody>
</table>

Source: Thomson Financial

### 2.3 Spillovers in Developed Economies

As defaults rose on US subprime mortgages, liquidity in the market for mortgage-related securities started to dry up, starting in the first half of 2007. The cost of insuring against default risk for subprime mortgage debt using credit default swaps (CDS) rose sharply on lower-rated securities (Figure 5); credit ratings on a range of subprime products were downgraded. As markets became illiquid, price discovery became difficult, particularly as these securities were traded in over-the-counter markets where information on volumes and prices is not usually disclosed. Stock prices for affected institutions fell.

**Figure 5**

Subprime Mortgage Default Spreads*

<table>
<thead>
<tr>
<th>Spread to benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>M</td>
</tr>
</tbody>
</table>

* Spreads refer to issuance for 1st half of 2006 from Jan-06, 2nd half of 2006 from Jul-06, 1st half of 2007 from Jan-07, and 2nd half of 2007 from Jul-07

Source: JP Morgan

**Figure 6**

Expected Bank Losses

<table>
<thead>
<tr>
<th>As of October 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>US$b</td>
</tr>
</tbody>
</table>

* Includes, among others, losses from trading, structured investment vehicles and monolines

Source: IMF
Institutions and other entities involved in the securitisation process started to come under financial pressure. Balance sheets were placed under pressure as entities found themselves holding loans that had been intended for securitisation. Some entities were required to repurchase bad loans because of conditions attached to early default. Financial institutions, notably investment banks, not all of which were domiciled in the US, were also exposed through lines of credit extended to the securitisation entities. Many other thinly capitalised housing lending firms went into bankruptcy.

In mid to late June 2007, problems arising from subprime loans began to intensify, around the time that Bear Stearns, a large US investment bank, announced significant losses in two of its hedge funds. Negative news about subprime loans appeared to be accumulating. In mid July, credit rating agencies announced a large number of downgrades on speculative-grade securities with exposures to subprime loans. Concerns were also starting to emerge regarding the exposures of European banks to subprime loans. In early August, concerns deepened about the risks associated with subprime loans and uncertainties as to which financial institutions would bear the main losses. This ultimately led to a marked shift in market sentiment. The issues that had been hereto largely confined to US mortgage-related securities now spilt across country borders and into other markets, and funding conditions in the banking sectors in these countries tightened sharply. Most particularly, Europe, with its significant exposures to losses from subprime assets (Figure 6) was affected concurrently with the US. (For further details on the chronology of events see Box B.)

Risk was now being more widely repriced across asset classes in the US and Europe, after a run of years when risk, in hindsight, was underpriced. It was soon realised that asset-backed commercial paper (ABCP) was also exposed to subprime losses, with investment-grade tranches of subprime-related securities included as part of the asset pool backing these securities. As investors became less willing to hold these securities, it created a pressure point in the market (Figure 7). Funds became less available for the purchase of mortgage-related securities, and when short-dated ABCP could no longer be rolled over, mortgage-related securities needed to be sold into a falling market. In Europe, ABCP markets were described as being virtually closed in mid to late August last year, while in the US, conditions were very tight. However, in the US, some borrowers with good reputations were still able to place paper, albeit at shorter maturities and with much higher spreads.

The pressures in the ABCP market quickly led to a shutdown in the market for mortgage-related securities. From August onwards, it became increasingly difficult to issue mortgage-backed securities (MBS), let alone the more complex structured finance...
### Box B: Credit Turmoil Timeline – Some Key Dates

#### 2007

**Feb-July**
Large losses from subprime lending start to emerge and some lenders go into receivership. In June, Bear Stearns bails out two of its hedge funds exposed to subprime lending. In July, ratings agencies downgrade their assessment of subprime mortgage-backed securities. Share prices fall on 27 July and 3 August as concerns about subprime losses mount.

**August**
French bank BNP Paribas suspends three funds investing in US subprime mortgage-related securities worth €2 billion. Major central banks undertake liquidity operations to ease pressures in funding markets. US cuts discount rate by half a percentage point. American mortgage lender Countrywide receives capital injection from private commercial bank and German banks, Sachsen Landesbank and IKB, are bailed out.

**September**
Bank run on Northern Rock, after its request for emergency liquidity support is revealed. Overnight bank lending dries up as banks fear defaults from each other. Further liquidity operations from ECB to ease pressures. US cuts Federal Funds rate by 50 basis points. The Bank of England (BoE) offers additional reserves. Mark-to-market losses of US$200 billion predicted on US mortgage-related securities.

**Oct-Nov**
A string of global investment banks reveal writedowns, including UBS, Deutsche Bank, Merrill Lynch, Nomura and Citigroup. US cuts Federal Funds rate again. In October, the three biggest US banking groups – Citigroup, Bank of America and JPMorgan Chase – agree to create a US$75 billion superfund to restore confidence. Abu Dhabi investment fund provides US$7.5 billion to Citigroup.

**December**
Federal Reserve, ECB, BoE, Bank of Canada and Swiss National Bank (SNB) announce coordinated action to address pressures in short-term funding markets associated with year-end funding. Temporary reciprocal currency arrangements established between Federal Reserve, ECB and SNB to alleviate pressure in (offshore) US dollar funding markets. BoE cuts interest rates for the first time, while US cuts Federal Funds rate for the third time. UBS, Morgan Stanley and Merrill Lynch all announce new investment from sovereign wealth funds to offset writedowns.

#### 2008

**Jan-Feb**
Large losses and writedowns reported by a range of banks, including Citigroup, JP Morgan Chase, and Merrill Lynch. Citigroup and Merrill Lynch announce further investments by sovereign wealth funds. Global stock markets record biggest one day losses since 11 September 2001 on 21-22 January, with contagion to emerging economy share markets. US cuts Federal Funds rate by 125 basis points in two steps in just nine days.

**March**
Central banks announce another coordinated attempt to ease conditions in interbank markets. US cuts Federal Funds rate by further 75 basis points. Bear Stearns is acquired by JPMorgan Chase for a fraction of its share price. US Treasury announces reform to regulation of US financial markets to prevent future crises. Total subprime-related losses estimated at slightly under US$1 trillion.

**April-May**
Further losses/writedowns recorded across US and European banks (UBS writedowns double to US$34 billion), although generally a quieter news period. US cuts Federal Funds rate again. BoE introduces Special Liquidity Scheme.

**June-Aug**
In June, ratings of 3 major US investment banks (Lehmann Brothers, Merrill Lynch and Morgan Stanley) downgraded, as well as those of the two largest monoline insurers (MBIA and Ambac). Increased credit concerns regarding large US financial institutions, including Fannie Mae and Freddie Mac.

**Sep-Oct**
Fannie Mae and Freddie Mac taken into conservatorship by the US government. Lehman Brothers files for bankruptcy while other large financial institutions in both the US and Europe come under severe distress or face insolvency. The largest remaining US investment banks apply to become bank holding companies. Major central banks undertake further coordinated injections of liquidity. Some countries introduce temporary bans on short-selling of financial stocks. Equity markets come under severe pressure. Central banks undertake coordinated 50 basis point rate cut. Various countries introduce programs to purchase troubled assets or equity stakes in financial institutions or to extend depositor protection. This included the launch of the US$700 billion Troubled Asset Relief Program (TARP) to take illiquid assets off the balance sheets of financial institutions and provide capital injections. EU leaders agree on a coordinated framework for national interventions in mid October. IMF assistance sought by a number of countries. Total subprime-related losses estimated at US$1.4 trillion by IMF and US$2.8 trillion by BoE.
products, in most developed economies, even for countries where significant subprime lending had not occurred or where the securities were backed by prime debt (such as Australia) (Figure 8, note the recent spikes in MBS in some countries represents self-securitisation\(^4\)). Uncertainty surrounding the exposures underlying many of the more complex products made it difficult to ration by price and, therefore, in this environment, investors rationed by quantity instead. In turn, as the securitisation market started to stall and the provision of loans to US subprime borrowers started to dry up, this further compounded the difficulties of subprime borrowers who were facing financial difficulty, as they now had few options in terms of refinancing to avoid default.

As the distribution chain for mortgages seized up, funding pressures reintensified on the banking sector. When some securitisation entities faced the prospect of bankruptcy, affiliated banks sometimes took these loans back onto their balance sheets because of concerns about reputation risk, even when there was no legal obligation to do so. Since some of these US banks also invested in subprime-related securities (usually the most senior tranches), they ended up with a dual exposure to subprime loans, which was not always recognised in assessing the concentration of risk in their books. The exposure to subprime loans, and particularly the potential for off-balance sheet exposures to come back on balance sheet during periods of financial stress, had been underestimated. Supervisory oversight of these risks had also proven inadequate.

A number of factors operated to amplify losses at this stage. A lack of market liquidity made price discovery difficult. As losses rose and prices fell, leveraged investors faced margin calls, and faced a need to sell assets, adding to downward pressures in mortgage markets. Price falls led to mark-to-market losses, leading to further margin calls and contributing to an adverse downward spiral. High leverage in off-balance sheet entities also compounded funding pressures on financial institutions providing financial support. Similarities in the accounting and regulatory standards in the US and Europe – such as the treatment of off-balance sheet entities in terms of disclosure and the use of fair value accounting – saw losses and market dislocations amplified in similar ways.

A number of features for financial market conditions were common across the most affected economies after the initial onset of the financial crisis. These were: a broad repricing of risk, severe shortages of market liquidity in many security and commercial paper markets, a shortage of funding liquidity in the interbank market, and, for some European financial institutions, a shortage of US dollar funding.

A repricing of risk has occurred across a range of markets and has been one of the most pervasive features of this episode. Movements in the CDS index – which provides a measure of the cost of insurance against default – indicate five periods, so far, in the current financial turmoil where concerns about risk have increased (Figure 9 shows the CDS index for investment-grade corporate bonds). The first was at the start of the turmoil and the second was when a large volume of rollovers were scheduled and there were concerns about meeting year-end liquidity requirements. The third occurred in early 2008 as more large subprime losses were revealed, estimates of ultimate losses were being revised up and a US recession and a global credit crunch both started to appear more likely. The fourth was from May to July this year, reflecting renewed concerns about credit quality, particularly with regards to some large US financial institutions (including the GSEs), and concerns that the crisis was starting to have a broad-based effect across the US economy. The fifth episode occurred in September as the financial turmoil appeared to enter a new phase, starting around the time some large US and European financial firms faced insolvency and concerns rose about a potential domino effect on the viability of other financial firms. Confidence in the financial system was severely shaken and concerns about global recession deepened.

\(^4\) Self-securitisation by banks has occurred as a result of MBS becoming an eligible asset for raising liquidity with the central banks in these respective countries. It is a means by which banks can increase their holdings of eligible collateral.
It is useful to keep these stages in mind in tracking when and where the various spillovers occurred. A perception of increased systemic financial risk in the first part of the year, leading up to when Bear Stearns was rescued in March 2008, is seen in rising implied default correlation measures (Figure 10). These measure the (implied) expected correlation of default across the underlying assets of a security, in this case, a US investment-grade structured finance product. Concerns about a potential cascading of defaults saw this measure spike higher again in September.

In line with rises in the CDS index, bond spreads have also widened. Up until mid September, the widening in spreads in the US largely reflected falls in yields on 10-year government bonds, with the latter reflecting investors’ increased preference for liquid, ‘safe-haven’ assets and significant cuts in the US Federal Funds rate. Over this period, highly rated corporate bond yields were relatively stable. However, renewed credit market disruptions in mid September led to a sharp rise in funding costs across developed countries, reflecting heightened concerns about default risk.

Multi-notch credit rating downgrades also contributed to the contagion across markets, particularly to other structured finance products. At the time when the financial turmoil began, credit ratings for structured finance products were often misunderstood and problems existed with the methodologies being used in compiling ratings. Around this time, credit rating agencies announced that they planned to change the assumptions and methodologies they used. These issues cast doubt on the ratings of other structured finance products, such as collateralised loan obligations (CLOs) (which are securities used to package up leveraged loan corporate financing), and investor interest in these other types of products waned or in many cases, disappeared altogether.

One of the most notable and persistent features of the financial crisis has been a severe tightening in funding conditions in the interbank credit market. This arose early in the crisis as banks became concerned about counterparty risk, which came on the back of increased pressures on bank balance sheets. As a result, banks increased their demand for liquid funds and became more reluctant to lend to one another. The perceived increase in counterparty risk, at the time, was a by-product of increasingly complex securities, with underlying exposures that could be hard to determine, and inadequate disclosure requirements that left exposures obscured. These concerns started to emerge slightly ahead of the more widespread turmoil, with CDS spreads for bank debt trending upwards from late July 2007. The concerns intensified, however, with the onset of the broader financial turmoil in August. Overnight interest rates departed from the targets set by a number of central banks. Central banks responded by injecting liquidity and

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5 Some central banks, such as the ECB, conduct their liquidity operations to achieve balance over a maintenance period. Therefore, injections of liquidity should be understood to be temporary,
some made changes to their liquidity arrangements (such as broadening the range of collateral that could be accepted and increasing the term of loans), which worked to ease these strains in overnight markets. Pressures in interbank credit markets for term funding have persisted since the start of the turmoil last year. In recent months, overnight interest rates have once again departed from targets. Term funding rates have spiked higher, particularly for US dollar funding. Central banks in a number of developed economies have once again injected significant liquidity to ease strains, including forming or expanding swap arrangements to facilitate the provision of US dollar liquidity.

An indicator of the severity of these pressures is the spread between the interest rate in the London interbank market (Libor) and the overnight indexed swap (OIS) rate at corresponding maturity (Figure 11). In principle, this spread provides a measure of the risk premium, which includes both credit and liquidity factors. This spread increased significantly in early August last year, and remained elevated despite unprecedented intervention by central banks. In September this year, these spreads widened further and are now well above levels reached earlier in the crisis. This sharp rise reflected heightened concerns about liquidity risks, particularly for term US dollar funding, and concerns about an increase in the credit risk of the banking sector, following the collapse or near collapse of some large financial institutions. These interbank spreads are now around historically high levels (Figure 12).

Market commentary suggests that European financial institutions faced difficulties raising US dollar funding after the onset of the financial crisis. European financial institutions needed to raise US dollar funds during this period as US securitisation entities called upon back-up credit lines established with these institutions. US dollars can often be raised by borrowing directly from US financial institutions; however, concerned about their own liquidity needs and potential counterparty risk, US financial institutions may have been reluctant to lend. Alternatively, necessary funds can be raised in domestic (or another) currency and converted into US dollars using a foreign exchange swap.

In the period immediately following the onset of the crisis, some pressures were evident in foreign exchange swap markets. Covered interest parity usually holds fairly closely in these markets. However, after the onset of financial turmoil, there was a divergence resulting in only a shift in the timing of liquidity provision over the maintenance period, but with a balanced liquidity position being achieved by the end of the period. The Bank of England also generally seeks to achieve targeted reserve balances over a maintenance period, but it has the option to oversupply or widen the ranges around target balances.
between actual US dollar Libor rates and the implied US dollar rate from the Libor of the euro, pound and yen, converted by the relevant foreign exchange swap, suggestive of pressures in obtaining US dollar funding (Figure 13). Over time, spillovers emerged in the longer-term cross-currency basis swap markets as well (these are generally used for foreign currency obligations of one year or more), as it was perceived that dollar funding requirements were likely to persist. Over the past few months US dollar funding has once again become scarce in markets outside of the US, particularly in Europe, as shown by the significant widening of the spread in Graph 13. To alleviate the demand for dollars from overseas, the Federal Reserve has significantly expanded its swap operations with other global central banks.

**Figure 13**

![FX Swap-implied USD Interest Rates & LIBOR](image)

Monoline insurers (more formally known as Finance Guaranty Insurers) have also been a conduit for contagion across markets during the crisis. The protection that they offer is dependent on their maintaining a high credit rating (usually AAA). However, as losses have mounted, most monolines have had their credit ratings downgraded. Bond insurance provided by monolines was used fairly extensively for structured finance products as a form of credit enhancement. As monolines have had their ratings downgraded, it has placed downward pressure on the ratings of all the debt that they have had insured, reflecting the higher probability that investors will face losses.

The winding up of securitisation vehicles and more difficult conditions in bond markets more generally has led to some reintermediation of lending back into the core banking sector in most developed economies. This has occurred particularly for lending for housing. Banks have in turn tightened their lending standards. As already mentioned, banks have faced increased pressures on their balance sheets, most particularly in the US but also in Europe. Bank balance sheets have needed to absorb losses related to subprime lending and reabsorb some loans that had previously been held in off-balance sheet entities. In turn, banks have needed to expand risk capital holdings against an expanded balance sheet and better cater for potential liquidity pressures during the current crisis conditions. In part, these funds have been supplied by sovereign wealth funds from emerging Asia and the Middle East. The partial recapitalisation of the banking sector has aided the adjustment process for the US economy, a testimony to confidence placed in their financial system that they have been able to attract capital during a period of financial turmoil (Figure 14). More recently, governments have been a significant source of new capital.

Disruptions to non-financial corporate bond markets have been much less severe than those seen in the housing market (Figure 15). There has been some volatility in issuance, particularly during periods of increased uncertainty or widening bond spreads. However, US corporate bond issuance has been much less affected than the US mortgage market. There are some reports that lower-rated firms have faced some difficulties in raising
Funds in bond markets during the crisis. Falling equity prices suggest that raising funds through new equity issuance has also become more costly. Equity prices have also become more volatile. In September, volatility in the S&P 500 spiked to levels not seen since the 1987 stock market crash (Figure 16).

Financial turmoil is contributing to a slowdown in the US and European economies, with spillovers to the global economy. Significant falls in asset prices, the end of a housing construction boom in a number of countries and falls in consumer and business sentiment are weighing on activity. Signs of weakening in the corporate sector are emerging, particularly for those exposed to consumption or housing construction or for those with significant exposures to energy prices. Standard feedback mechanisms between the real and financial sectors have come into play as the US economy has slowed (that is, standard credit cycle effects). Credit rationing, in particular, is having its effects on real activity, and is amplified by the decrease in the value of collateral.

Furthermore, mortgage rates remain high in several major countries despite monetary policy easings. In both the US and the United Kingdom (UK), mortgage-related credit growth has slowed from its rapid expansion in 2007 (Figure 17). While it remains

\[^6\] An increase in three-month-ended US housing credit growth in October 2008 is likely to be temporary, largely reflecting refinancings following a cut to fixed mortgage rates in September.
difficult to separate the extent to which the slowing in mortgage credit is attributable to supply-side factors or a decline in the demand for funds, both elements are likely to have played a role.

**Figure 17**

**Mortgage Credit and Lending Rates**

The slowing US economy and rising loan defaults exacerbated the stresses facing a weakened US financial sector. In July, speculation about the creditworthiness and solvency of the two largest GSEs (Fannie Mae and Freddie Mac) increased, leading to sharp falls in their share prices in August. In early September, the US government took the GSEs into conservatorship, placing them under the control of the Federal Housing Finance Agency and changing their mandate from maximising shareholder returns to meeting identified public objectives. A number of other complementary measures were taken, including provisions for the US Treasury to purchase mortgage-backed securities issued by the GSEs, in order to improve liquidity in the mortgage-backed securities market.

In September, the collapse or near-collapse of a number of large US and European financial institutions led to a sharp rise in concerns about counterparty risk. Short-term funding became more expensive and, for a time, markets at longer maturities ceased to operate. A wave of mergers occurred on both sides of the Atlantic as financial institutions scrambled to shore up their financial positions. Concerns about predatory short-selling leading to further collapses resulted in a number of regulators placing temporary bans on short-selling of financial stocks and/or take other related measures. Money market mutual funds also came under significant pressure owing to their exposure to ABCP issued by newly failed institutions. In an effort to bolster money market funds (which hold a sizeable percentage of issued commercial paper and bank acceptances), the US Federal Reserve introduced a program to extend loans to US depository institutions to purchase high quality ABCP and the US Treasury announced an insurance scheme for holdings of money market mutual funds. In order to address the underlying problem of financial institutions holding impaired assets, the US Treasury announced the US$700 billion Troubled Asset Relief Program (TARP) to acquire distressed mortgage-related assets and, as appropriate, inject capital into the banking system (it was renamed the Emergency Economic Stabilisation Act 2008 (EESA) following its passage through the US Congress).

As European banks came under renewed pressure in early October, governments took measures to reinstate market confidence. In early October, Ireland extended its depositor protection to include all deposits at a number of Irish banks. Many other governments have now extended similar guarantees for deposits and, in some cases, senior debt. In response to the worsening situation, the UK introduced a suite of measures, including purchasing shares in systemically important financial institutions in an effort to improve the balance sheets of its banks. Some countries have been forced to nationalise systemically important financial institutions (see Table 5 in Section 3.2 for an overview of recent measures). To improve the coordination of measures taken by individual Member States, European Union (EU) heads of state and government
reinforced their commitment to preserve financial stability at their meeting on 15 – 16 October and endorsed the common principles set out by the concerted action plan of the euro area countries of 12 October. They also announced that Member States’ responses have been consistent with the coordinated strategy.

At the time of writing, the near-term outlook was highly uncertain. One question is how extensive and protracted will the adjustment process be, as balance sheets undergo necessary restructuring and financial markets, and the mortgage market in particular, undergo some reshaping. This is occurring in an environment where house prices are still declining, financial turmoil has become more severe and the global economy is entering a downturn.

2.4 A Summary of Causes

In understanding the causes of the financial market turmoil, it is helpful to distinguish between those factors that contributed to rising defaults in the US subprime housing loan market and those factors that amplified these losses and resulted in major market dislocation in developed financial markets. These distinctions are useful in terms of determining the appropriate policy responses to these events, although such distinctions can be somewhat artificial as a number of factors have been important for both.

The key factors that led up to rising losses in subprime housing were: the low interest rate/benign economic environment that encouraged lending and encouraged the search for yield by investors among more complex financial products; regulatory structures that encouraged the increased use of securitisation and the expansion of the ‘originate and distribute’ mortgage model; adverse incentives in the financial sector that resulted in less attention to credit quality; lack of investor due diligence; and weaknesses in risk management systems and regulatory oversight that saw these lending practices continue even as credit quality continued to decline and risk exposures were building.

A broad range of factors have been involved in contributing and exacerbating the more severe financial turmoil that resulted. These include: lack of transparency inherent in complex structured finance products and in the over-the-counter market; difficulties and inexperience in using fair value accounting during periods of stress; weaknesses in risk management systems across all financial market participants, particularly with regards to liquidity risk; insufficient disclosure about exposures and risks; high degrees of leverage; overreliance on credit ratings and shortcomings in the credit ratings of structured products; and weaknesses in monolines. More broadly, high leverage has been a significant factor amplifying losses and leading to some financial institutions needing to sell securities into falling markets as they faced margin calls on earlier price falls, thereby contributing to downward price spirals.

2.5 Spillovers to Emerging Market Economies

There were initially few spillovers to EMEs from the financial turmoil occurring in developed economies. Some spillovers were evident in financial markets, particularly associated with the rise in global risk aversion. However, EMEs were initially much less affected than during previous crisis episodes, and the effects seen have taken longer to eventuate, which may in part be in recognition of their increased resilience compared to previous occasions. However, as financial market upheaval in developed economies has persisted, EME financial markets have come under more significant pressure, and volatility has increased. The effect of slowing global growth is also spilling over now to their real economies. As the financial crisis in developed economies becomes more protracted, the risk of further spillovers to EMEs is rising. Conditions in EMEs are currently evolving rapidly.

In the discussion that follows, it is important to recognise there has been considerable diversity in the experiences of EMEs in responding to the recent financial turmoil, which can at times mean regional EME aggregates can be somewhat misleading.
Some key spillovers

There are four main spillovers that have been evident across most EME financial markets: a rise in the price of risk, along with a rise in global risk aversion; a sell-off in equity markets; pressure on currencies; and some reduction in external financing. Pressures on currencies entail both an increase in volatility and depreciation pressures across a range of EME exchange rates, which includes effects from unwinding of carry trade positions. These developments have generally not moved one-for-one with developments in the advanced countries, with some differences evident particularly in the timing, but also in the scale of the effects. At least until relatively recently, markets have generally recognised the very different circumstances of most EMEs to the developed economies. However, there has been a closer correspondence between movements over the past few months than during the early part of the crisis. These four areas of spillover are discussed briefly below.

As part of the global repricing of risk, international investors also repriced risk in EME markets (Figure 18, Table 1). Initially, the rise in CDS spreads on sovereign debt for most EMEs was relatively modest and, as was the case for developed economies, these rises followed a period where risk was considered to have been underpriced. Generally, CDS spreads tended to rise earlier in countries with some external vulnerabilities or where governments are reliant on external debt financing or have lost some market confidence. It is only since September this year that spreads have risen sharply, reflecting a rise in global risk aversion stemming in part from concerns that slowing growth and financial turmoil in developed economies will increasingly spillover into EMEs. However, in contrast to developed economies, risk spreads for many EMEs currently remain below levels previously reached during periods of financial crisis in these economies. Yet, among EMEs, some country-specific concerns are apparent.

Up until August 2008, sovereign debt bond spreads generally rose proportionately with CDS spreads, which might suggest that a repricing of risk was an important factor driving the rise in bond spreads over this period. Widening bond spreads had primarily reflected lower US 10-year bond yields, while EME bond yields, and therefore the actual cost of finance, had remained relatively flat (Figure 19). However, EME bond yields and therefore, the cost of finance have now risen markedly.

**Figure 18**

Emerging Market Spreads

**Figure 19**

Emerging Market Bond Yields

There have been significant sell-offs in most EME equity markets since around October 2007, and like elsewhere, EME equity markets have shown increased volatility and have fallen steeply since September this year (Figure 20). During periods of recent volatility, some EMEs have temporarily halted trading on their stock exchanges. The fall in equity prices over the past year follows substantial rises over recent years, which, in many countries, have now been largely unwound. Up until mid year, equity markets in Latin
America appeared to have been less affected than other markets, with their total stock index being supported by the strong performance of commodity-related stocks. However, like elsewhere, Latin American equity markets have fallen recently. Risk aversion, a repatriation of foreign capital and, in some cases, falls in commodity prices have weighed down on equity markets in EMEs. Such effects have also weighed down on a range of EME currencies against the US dollar.

Table 1

<table>
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<th>Region</th>
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<td><strong>Emerging Europe</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>393</td>
<td>311</td>
</tr>
<tr>
<td>Poland</td>
<td>340</td>
<td>164</td>
</tr>
<tr>
<td>Russia</td>
<td>556</td>
<td>671</td>
</tr>
<tr>
<td>Turkey</td>
<td>479</td>
<td>379</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>442</td>
<td>381</td>
</tr>
</tbody>
</table>

Source: Thomson Reuters

Figure 20

Since the start of this period of financial turmoil, regional factors appear to have been important in determining movements in regional EME stock market indices. However, there are episodes where the correlation between market movements between developed economies and EMEs appears to rise, such as in the lead up to year-end last year, around
March this year, from mid May, and particularly during the turmoil since September this year (where the correlation appears to have been strongest). There appears to have been greater initial contagion effects across financial stocks than total stocks in EMEs, perhaps reflecting the reliance of some of these financial institutions on external funding, with the main falls coinciding with increased concerns about global credit conditions.

A feature of the recent financial turmoil has been a rise in the volatility of markets, including foreign exchange, and this has in turn reduced the attractiveness of carry trade positions. Up until early September 2008, the volatility of the currencies of the G7 has been greater than that of EME currencies, according to JP Morgan’s VXY Index. Carry trades involve investors borrowing in a low-yielding currency and using the proceeds to invest in a high-yielding one. The strategy implicitly relies on expectations that exchange rate movements will not fully compensate for the interest differential. However, volatility in markets raises the riskiness and reduces the rewards of carry trades. Carry trade positions have been partially unwound since the onset of the financial turmoil, and may have been a factor for some share market movements or currency movements for the destination countries. Destination countries for carry trades have included EMEs which have had relatively high nominal interest rates – for example, Brazil, Colombia, Hungary, Iceland, Indonesia, Turkey and South Africa. On the other side of the ledger, appreciation pressures have been seen, at times, in some funding currencies (which are primarily developed economy currencies), most notably, on certain occasions, the Japanese yen. This, of course, to some extent reverses the opposing pressures on exchange rates when the carry trade positions were first put in place.

Many EMEs have reduced their overall external financing to some extent since the onset of the financial crisis. Early in 2008, this appears to have reflected a reduction in demand from EMEs as funding costs rose, but also some tightening in lending conditions, particularly among private sector firms. However, most EMEs were able to access international funding markets and roll over debt, albeit at a higher price, when needed. As the financial turmoil has continued, some more vulnerable, generally smaller, EMEs have faced some increased difficulty in accessing international financing markets. This has reflected some increased concern about the outlook for these economies, but also a more general reluctance to lend given the broader reassessment of risk and often the need by firms in developed economies to hold more liquid assets.

Since the financial turmoil reintensified in September, more EMEs have faced some difficulties in raising funds in international markets. A few EMEs are being offered shorter maturities when debt is being rolled over, and concerns about the sustainability of their external financing requirements have risen in some cases. Some EMEs, particularly in emerging Europe, have large external financing needs and some countries have significant holdings of external debt in foreign currency, increasing their vulnerability. At the time of writing, some countries facing expected or actual financing difficulties have recently agreed Stand-by Arrangements with the IMF (subject to Board approval), namely Belarus, Hungary, Iceland and Ukraine. Other countries, including Pakistan, are in discussion with the IMF, while some other countries are exploring other options, including with other lending agencies or neighbouring countries.

Many EMEs are undertaking policy measures to support their domestic economies as slowing global growth starts to have an effect. A range of countries have eased monetary policy. In some countries, liquidity in interbank markets has become more restricted, particularly in relation to a rise in counterparty risk. In response, some central banks have been injecting liquidity and broadening domestic market operations as needed. At the end of October, the US Federal Reserve established temporary swap lines with Brazil, Korea, Mexico and Singapore to help alleviate US dollar funding pressures in these economies. In some EMEs, efforts by central banks to resist currency depreciations have led to some losses in foreign reserves. Some countries have also eased restrictions on foreign capital inflow. Some other measures being implemented are similar to those being implemented in developed economies, such as deposit insurance or guarantee of bank debt. The Korean government, for example, has recently announced a package of measures designed to increase investor confidence and alleviate some funding pressures, which included a government guarantee on the external debt of domestic banks. It has
also been noted that measures undertaken by governments in developed economies to support their economies and restore stability to their financial systems have important spillover effects to many EMEs.

**Other financial channels**

The financial turmoil has the possibility of affecting EMEs through a broader range of transmission mechanisms, which are discussed here. To date, not all of these effects have been particularly potent, although there are exceptions and some of these channels may continue to present risks to future performance, particularly as the crisis continues.

**Direct exposures.** The direct exposure of EME participants to losses from US subprime housing loans and to structured finance products has generally been limited. As at April 2008, losses on US subprime loans for EMEs were estimated to be less than US$1 billion (according to the IMF (2008a)), although it was also noted that in such circumstances, outcomes often turn out to be largely than initially indicated. These losses are expected to accrue mainly to emerging Asia, where there were a small number of cases of large exposures by individual institutions. EME exposures to structured finance products have been in part limited by regulation. The low exposures may also have reflected the availability of high returns on alternative investments in domestic markets.

**Overall capital flows.** As mentioned above, an increase in risk aversion and some repatriation of capital from developed countries has led to an outflow of capital from some EMEs over the past few months. Up until recently, EMEs had been faced with strong net inflows of private capital over recent years (Figure 21). EMEs located in Asia, which had strongly growing economies, and in Latin America and sub-Saharan Africa, which had strong investment opportunities in commodity and oil-related industries, had been attractive destinations for foreign investors. Into the early part of this year, even while developed economies were experiencing financial turmoil, the authorities within most EMEs had been faced with difficulties in managing capital inflows rather than capital flight. However, these trends now appear to be reversing.

![Figure 21](image)

A number of EMEs have some vulnerability to a sudden stop in capital flows. Some of these economies have a heavy reliance on external debt financing, most have large current account deficits and, at the end of last year, some were showing signs of domestic overheating. Some emerging European countries appear to have been vulnerable. Many of these countries are on a speedy path of convergence with euro area economies, and have relied on external funds to finance strong credit growth, in part because growth in the domestic deposit base has not kept pace with their rapid pace of credit expansion over recent years. If external funds were to become less available in some of these economies, there are unlikely to be good alternative domestic sources of funds to fill the gap, and a costly adjustment process could ensue. The composition of the capital inflows also points to potential problems, as there is a high proportion of...
short-term external debt and some exposures to exchange rate risk through borrowing in foreign currency.

Some EME countries, particularly in emerging Asia, have large current account surpluses that provide some protection against a sudden stop in capital flows. However, Study Group members have emphasised caution in taking a too sanguine view for these economies. Some current account surpluses have recently been eroded by rising commodity prices in their imports and, more recently, a reduction in exports as the world economy slows. Some countries that have benefited greatly from recent strength in commodity prices might be vulnerable to falls in these prices (as mentioned below).

Also, firms located within EMEs that have large current account surpluses can still face constraints in raising finance in international markets. In emerging Asia, the official sector is a net exporter of capital, which it directs primarily towards safe, liquid assets, whereas the private sector is a net importer of risk capital. These flows are not ready substitutes for each other. Hence, while a current account surplus ultimately provides strong protection against a sudden stop in flows, a change in foreign investor sentiment could still have significant macroeconomic effects.

A question of interest to the Study Group has been the extent to which EMEs may have been recipients of ‘safe haven’ flows during the initial period of financial turmoil. It appears unlikely that this has been a significant phenomenon. Safe haven assets during this financial crisis are likely to be those with strong liquidity characteristics, given that liquidity has been a particular source of stress, including cash, developed-economy government bonds and some commodities, most notably gold. Many EME markets do not have strong liquidity characteristics and therefore may not provide sufficient liquidity protection for international investors in this regard. Hence, while international private capital flows tended to favour EMEs up until the first half of this year, this seems to have been mainly a reflection of expectations about their relative economic performance. However, as discussed above, private capital is now tending to be withdrawn from EMEs. More generally, there appears to be no evidence of large-scale capital flight from the advanced countries most affected by the turmoil. Instead, a notable feature has been the ability of the US to attract foreign capital to assist in recapitalising its banking sector, although this might now be less likely to continue.

Study Group members have suggested for possible further work a more thorough investigation of the composition of capital flows in relation to both type and maturity. This would be useful for a better understanding of the nature of spillovers from developed economies into EMEs and, in particular, the role played by foreign investors.

**Bank and corporate funding.** Despite the upward repricing of risk and the associated rises in bond spreads, bond yields in EMEs were relatively unaffected up until September this year. In September, EME bond yields rose sharply. During the period of financial turmoil, there has been some discrimination across credit quality, with some lower-rated corporates and banks facing a relatively higher cost of funds and greater difficulty in obtaining finance in external markets.

Since the onset of the financial turmoil, international bond issuance from EMEs has fallen, particularly with regards to corporate bond issuance (Figure 22). Both demand and supply factors have been at work. Demand is likely to have been reduced in response to higher spreads and, earlier in the year, firms may have decided to delay issuance in the hope of a return to more normal conditions in the coming months. Firms may have had access to other funds, and may have also been reluctant to issue bonds into a relatively illiquid market. At the same time, on the supply side, there may have been some reluctance to lend, as there was a desire by lenders to hoard liquidity in the face of uncertainty. Lower-rated firms are the most likely to be vulnerable to the global reassessment of risk. They often rely on raising funds in external markets where investors are more generally willing to bear the risk, and when such funding is withdrawn, they may face few options in terms of raising funds in domestic markets.
For corporates, new share issuance has been an important means of raising finance over recent years. Cross-border Initial Public Offerings (IPOs) from some EMEs – most notably China, Brazil and Russia – has rivalled developed economies in terms of their scale (Table 2). This could be a source of spillover in the face of a significant adverse shift in sentiment. International bank lending to corporates and households has also risen sharply in recent years. The latest data from the BIS suggest that, in the Asian region at least, the turmoil has seen a pullback in bank lending to these sectors, which may in part reflect liquidity tightness in developed economy banks (Figure 23).

### Table 2

<table>
<thead>
<tr>
<th>Category</th>
<th>Value (US$ billions)</th>
<th>Share of total (per cent)</th>
<th>Number of issues</th>
<th>Average issue value (US$ millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>373.6</td>
<td></td>
<td>2397</td>
<td>16</td>
</tr>
<tr>
<td>Top 10 countries</td>
<td>276.2</td>
<td>73.9</td>
<td>1504</td>
<td>18</td>
</tr>
<tr>
<td>United States</td>
<td>88.3</td>
<td>23.6</td>
<td>300</td>
<td>29</td>
</tr>
<tr>
<td>China</td>
<td>65.5</td>
<td>17.5</td>
<td>249</td>
<td>26</td>
</tr>
<tr>
<td>Brazil</td>
<td>32.1</td>
<td>8.6</td>
<td>67</td>
<td>48</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>18.4</td>
<td>4.9</td>
<td>18</td>
<td>102</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>18.2</td>
<td>4.9</td>
<td>129</td>
<td>14</td>
</tr>
<tr>
<td>Spain</td>
<td>15.6</td>
<td>4.2</td>
<td>11</td>
<td>141</td>
</tr>
<tr>
<td>Canada</td>
<td>10.4</td>
<td>2.8</td>
<td>333</td>
<td>3</td>
</tr>
<tr>
<td>Germany</td>
<td>10.0</td>
<td>2.7</td>
<td>46</td>
<td>22</td>
</tr>
<tr>
<td>India</td>
<td>9.4</td>
<td>2.5</td>
<td>112</td>
<td>8</td>
</tr>
<tr>
<td>Australia</td>
<td>8.3</td>
<td>2.2</td>
<td>239</td>
<td>3</td>
</tr>
<tr>
<td><strong>Memorandum item</strong></td>
<td><strong>125.4</strong></td>
<td><strong>33.6</strong></td>
<td><strong>446</strong></td>
<td><strong>28</strong></td>
</tr>
</tbody>
</table>

*BRICs = Brazil, Russia, India and China

Source: World Bank (2008b); Dealogic DCM Analytics

Although banking sectors in most EMEs remain sound, a decline in investor confidence has led to fears of bank vulnerability in some EMEs. This has prompted some authorities to take measures such as implementing deposit guarantees and making liquidity available to domestic banks to reassure depositors and counterparties.

Among EME banking systems, concerns about potential vulnerability appear most prominent in emerging Europe. As noted above, these banking systems are characterised by a significant reliance on funding from external banks and from bond issuance, with the lower-rated banks generally the most exposed to a drying up of external finance. Russia, for example, has reported a substantial rise in the interest rate cost and tightening in availability of external funds for major Russian banks. External funding markets are now...
closed altogether for smaller banks. Moreover, foreign creditors are choosing to make use of early redemption offers on bonds of Russian issuers. Contracting banking liquidity in Russia, along with increased concerns about counterparty risk, led to substantial increases in the level and volatility of money market rates. Higher funding costs for Russian banks have been passed onto its customers and lending conditions have been tightened.

Further evidence of some tightening in funding conditions for EME banks is evident in the (albeit small) syndicated loan market, where lending to EMEs has contracted in 2008 (Figure 24).

![Emerging Market Bank Syndicated Loans](image)

Interestingly, instability in markets and greater uncertainty have fostered activity in some derivative markets, such as in Russia, allowing market players to hedge risks in underlying assets. For example, turnover of stock market trade in derivatives has been at record highs in Russia since August last year.

**Common lender channel or foreign bank presence.** The significant foreign bank presence within many EMEs, particularly in Europe and Latin America, raises a further potential source of contagion during periods of financial stress. The parent bank may be under some financial stress, may be inclined to hoard liquidity and may face difficulties raising funding in wholesale markets, restricting its ability to finance credit expansion in EMEs. This may lead them to restrict lending in their international operations, to scale down these operations, or to repatriate capital. This raises particular questions for emerging Europe owing to its heavy reliance on external financing, with the foreign banking sector being an important conduit for these funds (Figure 25). The parent banks involved are well capitalised and do not appear to have had large exposures to subprime debt or structured finance products; however, it seems likely that some European parent banks may be restricting lending in their cross-border subsidiaries.

Even without more severe contagion effects, parent banks are likely to undertake a broad reassessment of their risk exposures, and hence may still tighten lending standards in both home and host countries. Parent banks may raise concerns about credit quality in those countries where credit has grown very rapidly in recent years. Furthermore, the need to restructure balance sheets in the home country may have some protracted effects on the availability of credit from foreign banks.

Some Latin American EMEs also have a large foreign bank presence. Mexico has a concentrated exposure with around 40 per cent of its banking assets held by just two foreign banks. In contrast to emerging Europe, many of these foreign banks are locally funded, highly profitable and contribute to overall group income.
**Remittances.** There are some indications that remittances to EMEs are being affected by the recent financial crisis. Among EMEs, the three largest recipients in 2007 were India, China and Mexico, representing 2-3 per cent of GDP in India and Mexico, while less than 1 per cent of GDP in China. Remittances are not an inconsequential source of international income in many EMEs (Table 3), and can often be as significant a source of funds as foreign direct investment or tourism income. The Philippines is particularly vulnerable to changes in their remittances as the fourth largest recipient in the world, with remittances representing around 12 per cent of GDP and around 2½ times the size of their current account deficit. More generally, remittance flows are primarily sourced from high income countries that were affected by the recent financial turmoil, including the US and some European countries (Switzerland, Germany and Spain the top three). Other countries, such as Saudi Arabia and Russia, are also important sources of remittances.

Table 3

<table>
<thead>
<tr>
<th>Category</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007e*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>84.5</td>
<td>95.6</td>
<td>115.9</td>
<td>143.6</td>
<td>161.3</td>
<td>191.2</td>
<td>221.3</td>
<td>239.7</td>
</tr>
<tr>
<td><strong>By region</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>16.7</td>
<td>20.1</td>
<td>29.5</td>
<td>35.4</td>
<td>39.1</td>
<td>46.6</td>
<td>52.8</td>
<td>58.0</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>13.1</td>
<td>12.7</td>
<td>14.0</td>
<td>16.7</td>
<td>21.1</td>
<td>29.5</td>
<td>35.1</td>
<td>38.6</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>20.0</td>
<td>24.2</td>
<td>27.9</td>
<td>34.8</td>
<td>41.3</td>
<td>48.6</td>
<td>56.5</td>
<td>59.9</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>12.9</td>
<td>14.7</td>
<td>15.3</td>
<td>20.4</td>
<td>23.1</td>
<td>24.2</td>
<td>26.7</td>
<td>28.5</td>
</tr>
<tr>
<td>South Asia</td>
<td>17.2</td>
<td>19.2</td>
<td>24.1</td>
<td>30.4</td>
<td>28.7</td>
<td>33.1</td>
<td>39.8</td>
<td>43.8</td>
</tr>
<tr>
<td><strong>Sub-Saharan Africa</strong></td>
<td>4.6</td>
<td>4.7</td>
<td>5.0</td>
<td>6.0</td>
<td>8.0</td>
<td>9.3</td>
<td>10.3</td>
<td>10.8</td>
</tr>
</tbody>
</table>

*e = estimate
Source: World Bank (2008b)

By region, the largest remittances go to Latin America and the Caribbean, and there are indications that the flows of remittances to these countries are starting to slow in response to slower growth in the US economy. It is expected that remittance flows may be more seriously constricted if the US economy experiences a deeper or more protracted downturn. These countries may be particularly affected by a slowdown in the construction sector in the US, where many immigrants are employed. On the other hand, there are signs that remittance flows have increased to emerging Europe and central Asia, at least earlier in the year, benefiting from increases in incomes from higher oil prices.
**Commodity price channel.** During the initial stages of the financial turmoil, commodity prices may have been pushed higher as investors sought to hedge against a depreciating US dollar (itself one of the outworkings of the financial crisis) and possibly also as a hedge against higher inflation. Commodity prices have since fallen substantially from their peaks, and as global growth continues to slow, further falls in commodity prices are possible. This represents a downside risk to commodity-exporting EMEs, particularly Latin American EMEs. In an extreme scenario, where commodity prices fell dramatically, this could have significant implications for economies that have had a heavy reliance on the performance of commodities in recent years, including posing risks to the financial stability of these countries. The outlook for commodity prices is highly uncertain; however, it is reasonable to suggest that fundamental factors have shifted so as to support higher prices than were seen a few years ago.

**Role of institutional investors and hedge funds.** A possible further channel of financial transmission is the effect that institutional investors and hedge funds might have on the volatility of capital flows to and from EMEs, particularly during any period of market stress. These concerns have been raised again recently, as some movements in EME equity markets and currencies have been attributed to such firms unwinding their positions. It is acknowledged that institutional investors and hedge funds have been an important source of funds for EMEs, and have been instrumental in the development of local markets. Hedge funds, in particular, have been important for providing liquidity to financial markets in EMEs and facilitating genuine hedging activities. However, concerns are raised about some investment strategies, such as momentum trading, as well as pressures that leveraged hedge funds might face to unwind positions during periods of market stress. Since these institutions operate globally, such effects may arise even if the crisis is not located within EMEs. A related concern is that these investors may have significant impacts within EMEs simply because of their size relative to the markets in which they are operating, though the evidence on whether or not these areas of concern have added to market instability is inconclusive. One partial response to these concerns is for regulators within EMEs to be mindful of these risks, with a particular focus on ensuring that systemically important financial institutions manage their risk exposures to hedge funds and have some understanding of the nature of their exposures.

**Real channels**

Spillovers have been occurring through real channels, particularly as the crisis has become more protracted. A slowdown in growth in developed economies – as part of the outworking of the financial crisis – is having real effects on EMEs, primarily through the trade channel. Not surprisingly, trade-exposed EMEs have been, to date, relatively more affected. A secondary real channel is through confidence effects. If domestic consumers and businesses take on a more pessimistic perspective about both the global and domestic economic outlook, they would tend to be less willing to spend and invest.

In the early stages of the turmoil, there was much debate as to whether or not trade linkages with developed economies were likely to be less significant for EME growth than they were in the past, and more broadly, how resilient EME growth would be in the face of a US-led downturn in world growth. This is commonly referred to as the ‘decoupling debate’, and often has a particular emphasis on the East Asian economies.

The proponents for resilience argued that strong growth within EMEs, such as China and India, is driven by underlying long-run trends which rely on improvements in productivity, innovation, and skills and are therefore independent of year-to-year fluctuations in world demand. Strong momentum in the Chinese economy has provided an engine of growth for other EMEs over recent years, particularly those within the same region or those supplying the Chinese economy with commodities, and has been largely internally generated. They point to a decline in the relative importance of trade with developed economies, while intra-regional trade has expanded. It is argued that even as economies across the globe have become more inter-connected, this does not necessarily lead to the conclusion that these economies should become more synchronised. Finally, in the event of a significant downturn, spending patterns around the world may shift
down the value chain towards cheaper items, lending support to EMEs that produce these goods.

On the other side of the argument, the prime area of contention is the interpretation of trade data, particularly for the East Asian region. It is argued that an increase in intra-regional trade in East Asia masks the extent to which these goods are ultimately destined for export to developed economies. Firstly, higher intra-regional trade may be driven by greater trade in intermediate goods, with the production chain increasingly being split across country borders, even where the final goods are intended for export out of the region. Data from the IMF show that once these third-country effects are taken into account, export exposures to the US and Europe have increased over the past decade or so and by more than direct exports would suggest (Table 4). Also, higher intra-regional trade can also reflect the process whereby some final goods pass through ‘export-platform’ countries (such as Hong Kong and Singapore) before being exported out of the region. At this stage, trade spillovers to EMEs are becoming apparent, and the longer the current slowdown of industrialised economies persists, the more significant these spillovers are likely to be.

Table 4

<table>
<thead>
<tr>
<th>Export Exposure to Industrial Countries</th>
<th>Per cent of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposure to the US</td>
</tr>
<tr>
<td></td>
<td>Direct Total1</td>
</tr>
<tr>
<td>Japan</td>
<td>2.5 3.4</td>
</tr>
<tr>
<td>Australia</td>
<td>0.9 1.1</td>
</tr>
<tr>
<td>New Zealand</td>
<td>2.8 3.0</td>
</tr>
<tr>
<td>China</td>
<td>5.6 9.6</td>
</tr>
<tr>
<td>India</td>
<td>1.7 2.4</td>
</tr>
<tr>
<td>Hong Kong SAR</td>
<td>16.7 14.8</td>
</tr>
<tr>
<td>Korea</td>
<td>4.9 5.1</td>
</tr>
<tr>
<td>Singapore</td>
<td>23.9 17.3</td>
</tr>
<tr>
<td>Taiwan POC</td>
<td>10.4 9.9</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3.3 3.5</td>
</tr>
<tr>
<td>Malaysia</td>
<td>18.0 22.7</td>
</tr>
<tr>
<td>Philippines</td>
<td>8.8 8.0</td>
</tr>
<tr>
<td>Thailand</td>
<td>7.0 10.5</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1.4 15.2</td>
</tr>
<tr>
<td>Asia2</td>
<td>7.7 9.0</td>
</tr>
<tr>
<td>Industrial Asia2</td>
<td>2.1 2.5</td>
</tr>
<tr>
<td>Emerging Asia2</td>
<td>9.2 10.8</td>
</tr>
</tbody>
</table>

1 Includes indirect exposure through exports of intermediate and capital goods via third countries.
2 Arithmetic non-weighted average.
Source: IMF (2008f); UN COMTRADE Database

Summary: transmission to emerging markets

The ultimate impact on EMEs will depend on the relative strength and severity of each channel. Research suggests that, in the past, real economy spillovers have dominated financial spillovers in EMEs. Some Study Group members emphasise that real channels are likely to remain significant, as they have in the past, and it is important to recognise that these effects generally take longer to materialise. At the time of writing, both real and financial spillovers were evident.

At the present conjuncture, it is argued that the increased financial integration of EMEs into global financial markets could see an increase in the importance of financial channels. Moreover, the financial channels are likely to contain some of the more severe risks. Early analysis indicated that disturbances in advanced economy markets had resulted in heightened volatility in EME financial markets, although this had not at that time translated into a fall in real activity (unlike previous crisis episodes) and the decline
in EME asset values had been smaller than in the past. These factors point to increased EME resilience to financial shocks, which may help offset their greater global integration. Analysis also points to some increased investor differentiation between EME countries, suggesting that should the most vulnerable countries succumb to crisis, this may not necessarily be transmitted across EMEs in the same way as in the past. The relative importance of these transmission mechanisms is a topic that could be further debated.

With regards to trade spillovers, research generally suggests that EMEs have become more integrated into the global economy, and that a combined slowdown in the US and Europe could have a significant impact. There is evidence emerging of a slowdown in EME activity, albeit much less pronounced at this point than in previous crisis episodes. Early reports suggest that EMEs have to some extent been able to diversify exports to ‘non-traditional’ markets.
3. MAIN ISSUES FOR DEVELOPED ECONOMIES

3.1 Structure, Operation and Governance of Financial Markets

The causes identified for the recent financial turmoil raise a number of questions about the structure, operation and governance of financial markets, and have sparked debate on a number of issues. The main issues are reviewed below. Many of the issues covered in this and the following section of the report have been investigated in considerable detail by some of the international bodies, including in particular those that contributed to the recent FSF reports produced in response to the financial turmoil.⁷

**Originate and distribute mortgage model.** The benefits and costs of the ‘originate and distribute’ model are receiving close scrutiny. A significant claimed benefit was an expansion of credit availability to sound household borrowers who may have been previously unable to obtain a loan. Another purported benefit was a transfer of credit risk away from banks across a broader base of investors. Recent events, however, have brought to light a number of costs associated with this business model. The ‘originate and distribute’ model undermined bank incentives to effectively monitor the credit quality of the loans they were originating, it led to a decline in the relative amount of regulatory capital held throughout the system against the amount of credit that was being extended, and it produced a funding chain that could seize up in times of crisis. In addition, the credit risk transfer from the banks was not always complete, and under conditions of stress a surprising amount of credit risk was returned to the banking sector. A range of questions have been raised about appropriate future regulation and possible deficiencies in past regulations that contributed to these costs (more on this below).

There has been some debate as to whether the ‘originate and distribute’ model can survive, given that modifications designed to address the above-mentioned costs might be expected to wear away many of the benefits as well. Others suggest there is likely to remain a large market for securitised mortgages given appropriate repricing and suitable modification of incentives. Some have suggested that mortgage originators should be required to retain a portion of the risk exposure to loans that they have originated on their own balance sheet. Others have called for tighter supervision and oversight of all mortgage originators. The US has moved rapidly to impose federal regulatory oversight on all mortgage originators, including mortgage brokers.

**Structured finance products.** Structured finance products were the primary means by which funding was delivered to the subprime market. These products have been identified in many quarters as being overly complex, relatively illiquid (in good times, let alone bad) and difficult to understand, to price and to value. In particular, aspects that were not well understood included the severity of losses that might be generated or the multiple notch downgrades on credit ratings that could arise during a downturn in market. There have been some calls for structured finance products to become more standardised and to be placed on organised exchanges (rather than being traded in the over-the-counter market), in order to improve liquidity, transparency and pricing.

**Basel II framework.** Weaknesses have been uncovered in the existing regulatory framework governing banks, and questions have been raised as to how far these same weaknesses may be present in its replacement, the Basel II framework, which has just started to be implemented around the globe. Some of these issues are currently under review by the Basel Committee on Banking Supervision (BCBS). Key questions for regulators include: How well will a modified Basel II address the weaknesses this episode has identified? How should regulation be modified to improve liquidity risk management

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by banks (see, for example, recent work by the BCBS (2008))? Should regulation of the banking sector be intensified, or would that merely create new regulatory arbitrage opportunities? Does adequacy of capital requirements under Basel II need to be reassessed in light of recent events? How could sources of procyclicality in the financial system be mitigated? Should more financial institutions be brought under the regulatory net, particularly if they are systemically important? How well equipped are regulators to pre-empt and respond to future financial crises?

More specific issues facing regulators include: the recognition and disclosure of exposures to off-balance sheet entities (which is improved under Basel II), the valuation of bank assets (at fair value or otherwise) and the adequacy of risk management systems. As noted, many of these issues are currently under review by the BCBS.

Another broad issue for supervisors is how financial conglomeration interfaces with regulation. Issues here include the extent to which conglomerates are ‘too big to fail’, because of their systemic and social importance, or even ‘too complicated to fail’, but at the same time may be ‘too big to rescue’, because of the costs of bailout to the government. Often being global in nature, such institutions raise questions about regulatory coordination, and in the event of stress, the effect of legal jurisdiction and the ability of capital to be transferred across borders. Other issues include whether such institutions truly benefit from a diversified business base or whether, since all the businesses are within the financial sector, they are not truly diversified, but instead can be subject to common shocks.

**Bank risk management** was found particularly wanting in the area of stress testing. In a number of instances, banks failed to recognise all their potential exposures to the subprime market, particularly to off-balance sheet entities, and they underestimated the correlation between adverse events. This draws out, in part, the inherent difficulty in identifying tail risk scenarios for adequate stress testing. In coming up with stress test scenarios, organisations are required to ‘think the unthinkable’, which can in practice be a difficult task. This episode should, however, serve to refocus attention on areas that could be improved, including the management of funding liquidity risk. Most of the current defences in the supervisory framework are presumably designed to handle idiosyncratic risks to liquidity, rather than the more challenging case of a systemic problem, where everyone is scrambling for liquidity.

Concerns have also been raised that incentive structures may need to be changed for managers of financial institutions. In particular, it has been suggested that current remuneration arrangements encourage excessive risk-taking instead of promoting responsible behaviour. Various countries are now looking at drawing up codes of conduct to overcome such incentives.

**Fair value accounting.** The application of fair value accounting and its use during periods of financial stress have been much debated and, in many respects, criticised over the past year. The debate on these issues are detailed and complex. Concerns about fair value accounting include the extent to which it operates in a procyclical fashion to exacerbate financial stress. During the crisis period, there have also been concerns that fair value accounting has led to paper losses being realised on the books of financial institutions, even when prices had fallen below what was implied by the expected income stream of the underlying assets. However, among the Study Group, it has been argued that such conclusions may have been premature, and seemingly ‘too low’ prices are now seen to have been justified in some instances.

One of the key advantages of fair value accounting is that it forces institutions to recognise losses that might have otherwise been obscured. In turn, the disclosure of losses forces institutions to deal with them. Much of the current debate about fair value accounting is how to apply it during periods of market stress in a consistent and comparable manner. Difficulties in applying fair value accounting were evident in the recent period, in part reflecting inexperience in such conditions. Fair value accounting requires firms to value their assets at market prices (ie mark-to-market) or, when market prices are unavailable, firms can opt to derive a market price from market inputs
(so called mark-to-model) and failing that, derive a price using internal ‘unobservable’ inputs. Firms needed to decide when to shift between the approaches, which is meant to occur in response to the availability of information. During the crisis, such shifts were sometimes viewed adversely by the market. Some major international audit firms have joined together and produced a set of recommendations to guide firms as to when it is reasonable to move between these approaches. It is intended to stave off ‘cherry picking’ of approaches by firms.

Traditionally, banks have been largely exempt from having to adopt fair value accounting, since much of their loan book, at least until recently, was held until maturity and therefore could be valued at amortised cost under the main international accounting frameworks. An increase in bank holdings of securitised assets and derivative positions has broadened banks’ exposures to fair value accounting rules. However, it is worth noting that some supervisors have found the early recognition of losses an important element in motivating early intervention for ‘at risk’ financial institutions (such as under the Prompt Corrective Action Framework used by the US, which was introduced following the Savings and Loan Crisis in the 1980s).

In mid October, the International Accounting Standards Board (IASB) announced a change in fair value rules pertaining to the classification of some financial instruments. Companies may now value instruments on a cost basis if they both intend to and have the capacity to hold those instruments for the foreseeable future. The IASB approach to fair value accounting is now comparable to the approach taken by the US Financial Accounting Standards Board (FASB).

**Regulators.** This episode has raised some important questions about the nature and structure of the prudential regulatory bodies. Two issues have been particularly significant. The first relates to whether regulators have become quasi-legislative institutions rather than quasi-monetary institutions – that is, the extent to which regulators have confined themselves to a relatively narrow task of implementing regulations, rather than focusing on broader questions of systemic stability. In this context, it might be worth gaining a better understanding as to whether regulatory bodies had access to the information required to assess system-wide risks and the extent to which these supervisors sought to take account of these risks. A second, and not unrelated, issue is whether the quality of regulation has suffered under fragmented regulatory structures and/or high turnover of staff, with staff having a lack of hands-on experience in financial markets. There may be a case for renewed efforts to attract high quality and specialised staff to regulatory agencies. A further aspect of this debate has been a renewed focus on questions about whether responsibility for banking regulation should reside within or outside the central bank.

**Credit rating agencies** became intertwined in the structured finance market, advising firms on how products could be structured in such a way as to attract particular ratings. This combining of rating and advisory services has raised questions about the independence of the ratings attached to such products. The recent events have brought to light a number of specific concerns.

Firstly, with hindsight, ratings appear to have been too optimistic. Structured finance products, because of their complexity, are difficult to rate. They are particularly sensitive to assumptions made about how many risk factors are likely to come into play at once. In the case of mortgage-backed securities, this might include the likelihood that house prices will fall at the same time that borrowers will be required to pay a higher interest rate. These are often referred to as correlation assumptions.

Secondly, and in turn, this made the ratings susceptible to multiple notch downgrades when correlations between adverse factors turned out to be higher than first expected. This is in contrast to ratings for standard bonds, which very rarely experience multiple notch downgrades.

Thirdly, when events started to unfold, credit rating agencies appear to have been slow to reassess the value of affected products. This raised the issue of the adequacy of rating
agencies’ resources to monitor initial ratings against further market developments, but it also highlighted that structured finance ratings by their design did not focus on aspects beyond credit risk (for example, liquidity risk) or the risk of multiple downgrades.

Finally, the ratings for structured finance products were on the same scale as those for bonds, even though the characteristics of these securities, and the way the ratings needed to be interpreted, were fundamentally different. There have been widespread calls for ratings for structured finance products to be placed on a different scale to bonds, possibly by adding a measure for downgrade risk.

**Investors** don’t always appear to have understood credit ratings. The different interpretation of these ratings, their susceptibility to multiple notch downgrades and so forth went unappreciated by some investors. Some investors relied too heavily on credit ratings, in place of their own due diligence in assessing risks. It has been suggested that, in the recent episode, investors were too willing to invest in products that they did not have the capacity to assess. This in turn was related to the ‘search for yield’ discussed earlier.

Furthermore, investors have not always understood that credit ratings only measure the risk of default, and do not incorporate other risks, such as liquidity risk or volatility. During the crisis, problems in market liquidity emerged fairly early on in mortgage-related securities, presenting risks that were never intended to be summarised by its credit rating.

**Monolines** are a provider of bond insurance, which could be added to a structured finance product to lift its rating (see Figure 2 and Box A). In this way, they were another integral part of making these products viable. As events have evolved, they have also been a source of potential spillovers. Their business model relies on them maintaining a high credit rating, and as mark-to-market (even if not actual) losses have mounted, these ratings have been threatened. A decline in their ratings undermines the credit quality of all securities that they insure. Since there is high market concentration in the bond insurance industry, downgrades to the monolines can have widespread effects on the bond markets.

**Hedge funds.** Similar to other market participants, the recent market turmoil has severely tested the depth of hedge funds’ balance sheets, the robustness of their trading strategies and the integrity of their risk and liquidity management systems. While some institutions have failed, those that have exited the industry have done so in an orderly manner, suggesting that prime brokers' exposures are well collateralised, modest in relation to their capital, and well monitored. In the future, higher margin requirements might mean that hedge funds are less able to leverage themselves, something that has the potential to exacerbate market illiquidity given the increasingly important role of hedge funds in providing liquidity (in good times).

### 3.2 Dealing with Financial Crises

Recent events have tested central banks and other authorities in their ability to respond to financial crises. A few of these issues are discussed below. A key theme has been that central banks need an adequate array of tools to alleviate stresses in financial markets when and where they arise. Flexibility in arrangements has been important.

**Central bank liquidity operations.** One key challenge for central bank market operations has been to provide sufficient liquidity to the market without undermining the monetary policy setting. Many central banks around the world have faced an increased demand for cash, as banks have become less willing to lend to each other and the interbank money market has come under pressure. This reflects increased concerns among banks about counterparty risks and a tendency to hoard liquidity to meet their own ongoing funding needs under more uncertain conditions.

The need for central banks to adjust their liquidity arrangements has depended on the flexibility in their existing arrangements and the severity of the financial strains they
were facing. For example, the ECB found existing arrangements to be relatively robust and did not need to make significant changes to their framework in order to steer the overnight interest rate in line with the monetary policy stance following the onset of the financial turmoil.

To ensure adequate liquidity in the financial system, many central banks have needed to adjust their frameworks or modify existing arrangements. Such changes have included a widening in the type of collateral accepted, the range of counterparties dealt with and the term at which funds are provided. In making these changes, central banks have faced a number of issues. These included the assessment of counterparty risk and quality of collateral when accepting a broader range of instruments. Central banks have also focussed on the need to design liquidity facilities in a way that does not impart any stigma to the borrower.

An issue for central banks in the future is whether or not to make recent changes a standard part of the framework. Recent experience would suggest that, in any event, central banks need to retain the ability to quickly adjust their operating frameworks. Given potential moral hazard risks associated with these new facilities, it is important that countries have strong and flexible regulatory and supervisory frameworks to ensure that institutions have adequate incentives to effectively manage their liquidity risks.

Some examples of central bank liquidity actions during the recent crisis are provided in Box C and Table 5.

**Lender of last resort.** Recent events have provided the impetus for central banks around the world to revisit the adequacy of their lender of last resort facilities. More broadly, it has encouraged relevant authorities to revisit procedures for dealing with a failing institution.

As lender of last resort, the central bank may choose to lend to an otherwise solvent institution facing short-term funding difficulties, particularly where the institution concerned is systemically important. The first issue that arises is assessment of the solvency of the institution. In real time, such assessments are likely to be difficult, if not impossible, particularly during crisis conditions where prices may be unavailable. The second related issue is the ability of the central bank to assess the quality of the collateral it is being offered. By virtue of the bank needing to access this facility, the collateral on offer is not likely to be liquid, and the central bank is likely to be exposed to credit risk. Thirdly, there is an issue as to if and when this assistance is disclosed to the market. Immediate disclosure may often bring about the events that the assistance was intending to prevent. However, keeping assistance quiet may be very hard to achieve in practice. Finally, a loan of last resort is often likely to end up being simply bridging finance while a takeover or major restructure of the institution is organised.

These considerations suggest that when there is a need to provide support, arrangements need to be already in place between the various relevant authorities, which could include the government, the central bank, the banking supervisor (if separate from the central bank) and potentially the insurance provider covering depositors.

A further issue is the need for an adequate range of tools to ensure an orderly resolution of a failing institution. Such tools might include the ability of the authorities to take control of all or part of a failing bank, to appoint a restructuring officer and to provide appropriate financial support. It is also important to have in place the right legal and institutional structure to facilitate swift payout of depositors’ claims.

In the US, their Prompt Corrective Action Framework – designed to limit regulatory forbearance and ensure early intervention in problem banks – combined with limited deposit insurance, has been instrumental in managing bank failures in a manner that has prevented widespread panic. Typically, a failing US bank closes on Friday evening and re-opens Monday morning under new ownership or Federal Deposit Insurance Corporation
BOX C: Examples of Central Bank Liquidity Actions

Central banks have responded to the turmoil with a range of actions to provide additional liquidity to the financial system. These responses have varied, reflecting the differing impact of the turmoil across regions as well as the pre-existing framework in each region. The BIS Committee on the Global Financial System (CGFS) (2008) recently undertook a review of the different approaches taken by major central banks, and some examples of these approaches to the crisis are given below. Many of the innovations in central bank operations and facilities have been aimed at overcoming a stigma problem that led to institutions capable of borrowing from standing lending facilities choosing not to do so. In some cases, this led to them being charged higher rates of interest than would have been the case had they used the standing facility. This stigma varied in importance across countries, as did methods of combating it.1 While this is not an exhaustive list of central bank actions taken, it gives a snapshot of the cross-country variation in operations.

In order to keep short-term money market rates near their desired levels, central banks pursued a number of avenues, such as conducting operations outside the normal schedule, or in larger amounts. For example, on 9 August 2007 and the days following, exceptional operations were carried out by most major central banks. Central banks also took measures to ease pressures in term money markets. Examples include the successive increases in duration of discount window borrowing from overnight to 30 days then 90 days in the US, and the offering of the first ever six-month repurchase transactions by the Swiss National Bank (SNB). The Bank of England (BoE) conducted open market operations at three-month maturity against an extended range of collateral, while the newly created Term Auction Facility (TAF) in the US allows funds to be auctioned for either 28- or 84-day maturities against discount-window collateral.

Other measures taken to relieve liquidity pressures in money markets include some central banks expanding the range of collateral accepted in their regular market operations or newly created facilities that catered for a wider range of collateral. The expansion in eligible collateral has largely focussed on mortgage-related securities and commercial paper, aiming to restore liquidity to markets that have seized up during the market turmoil. In some instances, counterparties keenly took advantage of such provisions during the period of financial turmoil. A case in point was the European Central Bank (ECB) (whose pre-existing monetary policy framework already accepted a relatively broad range of collateral).

Another approach taken was to undertake collateral swaps. Under the Special Liquidity Scheme (SLS) in the UK or the Term Securities Lending Facility (TSLF) in the US, counterparties could swap their relatively illiquid collateral for liquid government securities. As financial markets came under renewed stress in September 2008, the Federal Reserve further expanded the range of collateral accepted under the TSLF to include all investment grade debt.

Measures have also been taken to improve liquidity in the markets for specific securities. For example, the US has introduced a number of new facilities targeting tensions in particular areas. The Commercial Paper Funding Facility (CPFF) aims to improve the liquidity of the commercial paper market by purchasing unsecured and asset-backed commercial paper directly from issuers, while the Money Market Investor Funding Facility (MMIFF) involves purchasing money market instruments of 90-day maturity or less from money market mutual funds.

A number of central banks also widened the range of counterparties they dealt with during the course of the turmoil, with a notable example being the US. The introduction of the Primary Dealer Credit Facility (PDCF) enabled non-depository institutions to borrow from the discount window for the first time since the 1930s and allowed for a wide range of collateral to be used.

As pressures rose in US dollar funding markets (particularly those operating in different time zones to the US), it became important for central banks to operate in a coordinated fashion. In particular, swap lines between the ECB, the Swiss National Bank (SNB), and the US Federal Reserve were set up in December 2007 to enable European institutions to access US dollar funds more easily, helping to relieve pressures in short-term money markets. These measures were updated as conditions required, with a significant expansion of existing swap lines and the creation of new swap lines with other countries in September 2008, and again in October.

As the credit turmoil intensified, a number of major central banks also conducted a coordinated rate cut. The Bank of Canada, BoE, ECB, Sveriges Riksbank, SNB and US Federal Reserve all lowered their reference rates by 50 basis points in an effort to provide impetus to waning economic growth.

1. For example, the US Federal Reserve attempted to attract borrowers to its standing loan facility with successive cuts to its spread to the Fed Funds rate. In the euro zone, stigma appeared to be less of a problem; institutions continued to use the marginal lending facility as often as during normal times.
(FDIC) receivership. The action is publicly announced but seamless for depositors who retain full access to their deposits of up to $250,000 (the new cap on FDIC deposit insurance).

**Government responses.** Since mid September 2008, governments in a large number of countries enacted a series of measures in an attempt to stabilise financial markets. New measures include (but are not limited to): restrictions or bans on short selling in equity markets, extensions of depositor insurance and/or guarantees for wholesale funding, provisions to take equity stakes in financial institutions, provisions to buy impaired debt from financial institutions, provisions to purchase new mortgage securities, and increases in public spending (Table 5). These responses appear to have had some positive effect on market sentiment, particularly if coordination is stepped up, as reactions to EU measures suggest. However, assessments will need to be made as to the ongoing effectiveness of these measures and whether further – and better coordinated – measures will be needed.

**Table 5**

**Recent Measures of G-20 Members**

Since mid September 2008

| Argentina | Australia | Brazil | China | Canada | Switzerland | France | Germany | Italy | Japan | Mexico | Russia | South Africa | Saudi Arabia | South Korea | Turkey | UK | US |
|-----------|-----------|--------|-------|--------|------------|--------|---------|-------|-------|--------|--------|--------------|-------------|-------------|--------|----|---|---|
| **Liquidity and monetary policy measures** |
| Liquidity injections | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Policy rate cuts | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Modifications to domestic market facilities | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Introduction or increase in foreign currency swap lines | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| **Measures to improve liquidity beyond money markets** |
| Collateral swaps | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Partial/full guarantee of bank debt | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Direct or indirect purchases of illiquid assets | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| **Other measures to improve funding** |
| Facilitated sales | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Capital injections | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Conservatorships | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Nationalisations | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Purchase of impaired assets | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| **Other measures to support financial stability** |
| Restrictions on short selling of equities | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Increased depositor protection | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

1. For example, the BoE's Special Liquidity Scheme which allows banks, for a period, to swap illiquid assets of sufficiently high quality for Treasury Bills.
2. For example, guarantees of wholesale funding of banks. Includes guarantees either by the central bank or the government.
3. For example, the US Commercial Paper Funding Facility and an Australian government agency's intended purchase of MBS.
4. Covered by the declaration on a concerted European action plan of the Euro area from 12 October 2008, which includes that "Governments remain committed to support the financial system and therefore to avoid the failure of relevant financial institutions, through appropriate means including recapitalization." This could potentially include a range of measures.
5. In Germany: On 5 October 2008, political guarantee for all private deposits. In Italy: Depositor protection up to € 103,000 backed by an inter-bank fund existed prior to mid October. This was then enhanced by creating the capacity for a state guarantee.
6. Restrictions on short selling existed prior to mid September. Enhanced disclosure from exchanges on short selling is now being sought.
7. In October, the Turkish Monetary Policy Committee decided to keep borrowing rates - the key policy rates - unchanged, while lowering the lending rates by 50 basis points.
8. On 9 October 2008, Central Bank of Turkey resumed its activities as an intermediary in the foreign exchange deposit market. Transaction limits in the Foreign Exchange and Banknotes Markets were increased, foreign exchange buying auctions suspended and foreign exchange selling auctions were started in the following days.
9. These measures were implemented prior to the European declaration.
X Measures implemented or in the process of being implemented
# New capacity created or announcements about intentions, but measures not implemented at this point

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4. MAIN ISSUES FOR EMERGING MARKET ECONOMIES

The recent financial turmoil has highlighted financial sector weaknesses in developed economies, while EMEs have been less affected, at least until relatively recently, by virtue of the fact that financial institutions in most EMEs have had very limited exposures to structured finance products. However, more recently, a number of EMEs have been faced with more immediate policy challenges (as referred to in Section 2.5). Furthermore, some important questions remain for EMEs to consider concerning the potential for EMEs to be susceptible to the weaknesses seen in developed economies, including some specific vulnerabilities that can arise. This section of the report does little more than summarise some key short- to medium-term questions that have been raised for EMEs in light of recent events.

**Improving regulatory frameworks.** The recent experience in developed economies has highlighted various weaknesses in their regulatory structures (such as liquidity assessment, stress testing and treatment of off-balance sheet entities) that suggest areas for review by EMEs. It has also highlighted that whatever the existing risks are, new risks are always going to emerge. Although, some EMEs already have sophisticated regulatory frameworks, EMEs could review their regulatory frameworks in light of these events and consider how effectively they are implemented and enforced. For example, improvements in risk management systems may matter little if bank management favour credit expansion over risk control. Also, in many EMEs in recent years, credit has grown strongly, and this can present challenges to maintaining credit quality for even well-managed banks. This is something that both regulators and financial institutions may need to be mindful of. It has raised questions about adequacy in numbers and quality of staff in regulatory institutions, as well as the overall adequacy of resourcing of these functions in developed economies. It seems a worthwhile question to be asked for EMEs also.

Another important consideration is that measures to promote capital adequacy and contain risk-taking can have implications for the efficiency of the banking sector. Hence, it is important to combine such measures with continued attention to the banking sector’s competitiveness. Some EMEs face concerns about the costs of requiring their banks to acquire the infrastructure to meet best-practice regulatory requirements, and the associated effect on bank profitability.

Russia and Brazil are notable examples of EMEs that are pursuing a number of measures to improve their regulatory frameworks. In Russia’s case, these measures include: creation of banking institutions adequate to modern trends in banking; development of risk-based supervision and reaction to problems at an early stage; improvements in liquidity management; reducing dependence on external financing, and so forth. Risk-based approaches for supervision have been introduced, examining: the nature of operations, asset quality, capital, liquidity, profitability, quality of systems of management and internal control. The Bank of Russia is currently preparing a regulation that will provide a differentiated approach to supervision of credit institutions depending on risk assessments of their individual and systemic stability. Annual stress testing is carried out by the central bank and has become integral to risk management systems at many banks.

Brazil has been intensively reviewing and updating its prudential regulatory framework since 1994, and the convergence with international recommendations and best practices is a statutory mission of the Central Bank. Risk management and internal controls regulations, as well as dynamic loan loss provisioning requirements, large exposure limits and Basel requirements have been in force for years. In 2004, the Central Bank of Brazil announced its roadmap towards implementation of Basel II, and in 2006 its schedule for implementation of the International Financial Reporting Standards (IFRS), to be completed by 2012 and 2010 respectively. The non-advanced approaches for Basel II started being applied on 1 July 2008, and the Central Bank of Brazil has used its national discretion to implement international standards in such a manner as to reflect domestic market conditions. Furthermore, the Central Bank of Brazil continues to foster improved risk management by financial institutions, and has recently issued regulation of a
qualitative and managerial focus concerning management and control of operational market risk.

Significant advances have been made to regulatory frameworks in some other EMEs also.

**Foreign banks.** Foreign banks offer benefits to the host country, including stronger competition in the banking sector, new financial products, potentially greater availability of finance to the economy and often more developed regulatory infrastructure. However, a significant foreign bank presence in many EMEs has represented a potential source of contagion during the financial crisis. Financial stress in the parent bank can potentially lead to a scaling back of lending in the host country or a repatriation of capital or even a closing down of cross-border operations. In some countries, these effects could be very large, given the host country may be a very small part of the parent bank’s global portfolio and where the host country has a concentration of risk to a couple of parent banks or where the parent banks mainly come from one or two countries. However, to date, this largely remains a risk.

Furthermore, there are some increased complexities in supervising foreign banks. The health of these banks can depend on their international operations, for which the host country has little control. It raises the importance of effectively seeking information and sharing information with the home country supervisor. In the event of a bank failure, cross-jurisdictional issues can complicate resolution strategies.

**Crisis prevention and management.** The key message to come from this and previous financial crises is that while crises are better prevented than managed, not all crises can be prevented and so many of them will need to be managed. Central banks and other government authorities in developed economies have been tested in their ability to respond to recent financial stresses. They have been tested both in terms of their ability to provide liquidity to the banking sector, and also in their ability to fulfil their lender of last resort function. These challenges suggest a good opportunity for all relevant authorities to consider their capacities in these regards. Also in terms of crisis management, as already mentioned, many Asian countries have large foreign reserves (and sovereign wealth funds) that provide a substantial source of insurance in dealing with financial crises. Within Asia, the Chiang Mai Initiative has seen the ASEAN+3 countries establish bilateral swap lines between themselves to help ease liquidity pressures in the event of financial crises. Recently, agreement was reached to expand these arrangements into a multilateral scheme. But while there are benefits to dealing with regional crises at the regional level, this may not always be possible, if shocks across the region are common, or where extra-regional spillovers occur.

**Developing and liberalising financial markets.** Financial liberalisation and global integration carries with it both benefits and risks. There is the potential for significant economic benefits through the enhancement of risk sharing, increased efficiency and competition and improvements to productivity and growth. These benefits are usually observed for developed economies and for EMEs that surpass certain thresholds on a variety of indicators that include financial market development, institutional quality, governance, macroeconomic policy frameworks and trade integration. The costs can include a wider propagation of shocks and the effects can be more severe. The current episode appears to have reinforced the message that came out of the Asian crisis, that good prudential supervision is an important prerequisite to capital liberalisation. Illustratively, in India, complex structures like synthetic securitisations have not been permitted so far. As and when such products are introduced, the Reserve Bank of India would put in place the necessary enabling regulatory framework, including calibrating the role and capacity building of the rating agencies. Issues related to sequencing financial liberalisation have been of interest to the G-20 Group before, being a topic of discussion at workshops in 2004 and 2008.

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9 See for example Kose *et al* (2006) for a discussion of these issues.
While there are costs to increased global integration, those countries best placed to benefit from global integration are also likely to be best placed to handle the risks. This has arguably been illustrated in the current episode. For example, while investor confidence for the developed economies was shaken, it did not collapse. Banking sectors have been able to recapitalise to some extent. And policy makers in developed economies have shown flexibility and capacity in using monetary and fiscal policy to mitigate the effects of financial turmoil and a slowing economy. Arguably, this reflects the operation of the factors mentioned above in providing resilience to these economies. Among the resilience factors has been exchange rate flexibility, which has borne some of the adjustment.

**Managing financial innovation.** Financial innovation also entails benefits and risks. It often appears to arrive to compound other risks; for example, occurring when economies are undertaking rapid financial liberalisation, or in the current circumstance, when credit in the US was already growing strongly. Since the benefits of innovation can be substantial, the issue is how to best manage the risks. The core questions for regulators include the extent to which you allow the core banking sector to be exposed to new financial innovations and how regulation and supervisory oversight can possibly keep pace with the new risks that these products bring. Some EME countries have tended to be cautious in this regard, which has been beneficial to them during the current financial crisis.

Recent events have also highlighted that the banking sector does not need to be directly exposed to new innovations for risks to return to the banks. This means that regulators in all countries may need to broaden the range of risks they pay attention to. Recent events have illustrated that where the innovation is designed to work around current regulation, it is likely to entail an increase in risks to the core banking sector, for example through an increase in leverage as was the case in the current crisis.

Financial innovation should, however, not be seen as necessarily destabilising or risky. Many of the innovations seen in financial markets over the past twenty years has increased the efficiency of financial markets, facilitated the allocation of capital and in many cases allowed economic agents to better manage their risks (for example, through derivatives that facilitate exchange rate hedging).

In the current episode, important lessons have been learnt about risks associated with complex structured finance products. But even here, care should be taken not to ‘throw the baby out with bath water’. Structured finance products could potentially be helpful in EMEs in more effectively structuring their requirements for debt financing with the risk profiles of domestic and international investors. The way this could be done in order to best mitigate the risks would require some careful consideration.

**Resilience.** It is argued earlier that resilience factors have assisted developed economies during this episode in mitigating the effect of the shocks hitting the economy. Most EMEs now stand in a better position than they did a decade ago to withstand shocks in financial markets and increases in global risk aversion. EMEs have, so far, been less affected compared to previous crises, which may in part be a testimony to that.

The factors that are identified as being important for resilience, and for which progress has been generally made, include more credible policy frameworks backed by more credible policy institutions, stronger fiscal positions, more flexibility in exchange rates, as well as improved performance in the banking sector together with better banking supervision and risk management, and in some cases, better structuring of banking sector debt. Some EMEs also hold large foreign reserves, particularly within Asia, that provides some protection against risks of a sudden stop in capital flows, though this can present its own difficulties. The substantive progress made in many EMEs should be recognised, and efforts to continue the reform process should be commended.

However, some EMEs still have vulnerabilities. Heavy reliance on external financing at relatively short-term maturities, and exposure to debt raised in foreign currencies, can in turn have implications for the capacity to use monetary policy effectively during financial
crises. And accumulation of foreign reserves without a flexible exchange rate can mean it is difficult to sterilise, leading at certain times to easier financial conditions than appropriate for domestic objectives.

Financial conditions. Many EMEs face a number of challenges in managing domestic financial conditions. Until recently, many EMEs faced strong capital inflows, which fed liquidity into their domestic economies and raised questions about the similarities in their domestic conditions with those that led to problems in the US market. However, concerns are now being raised regarding capital outflows for some EMEs. As is becoming apparent, some countries will need to deal with significant difficulties in raising funds in international markets or even face a sudden stop in capital flows and the challenges that presents. Strong macroeconomic policies implemented over recent years is the first line of defence in this regard, as is some build-up of foreign exchange reserves, but in some cases, it may not be sufficient. The extent to which these factors affect the domestic economy depends on the reliance of banks, firms and government on external financing, the frequency with which the debt is rolled over and the exposure to foreign currencies. Such factors mean that some EMEs are more vulnerable, such as within emerging Europe, while other EMEs have worked to make their economies less vulnerable in these respects, particularly among G-20 countries. In any event, it reaffirms one of the lessons from the recent developed economy experience that careful monitoring of credit quality and lending practices and improved prudential oversight of the banking sector (and the financial system more broadly) is called for to ensure that the financial system is robust when more difficult conditions arise. Overall, many EMEs face a difficult policy environment in the future that also includes slowing growth in developed economies and more turbulent international financial markets.

Areas for further work. Study Group members have made a number of suggestions for further work on issues for EMEs, including reasons for the initial resilience of EMEs and comparisons between this and previous financial crises. Greater understanding of how some of the various issues raised in Section 3 for developed economies might apply to EMEs would be useful. More specifically, there is interest in a further investigation into issues related to regulation – such as liquidity risk management, the comprehensiveness of the supervisory umbrella and regulation of financial conglomerates – and the management of risks associated with mortgage brokers and structured finance products, which seem to have become more important recently for a few EMEs. Finally, how EMEs can best improve their market and regulatory infrastructure to most effectively use their central banking liquidity operations during periods of financial stress may be another area for further work.
5. KEY POLICY ISSUES AND INTERNATIONAL POLICY COORDINATION

5.1 Policy Issues

There is a strong appreciation of the need to address the main underlying causes of recent financial stresses. Work on these issues has already been conducted in international fora, and is continuing. The FSF has published a series of policy recommendations in its ‘Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience’ and a subsequent ‘Follow-up Report on Implementation’. These reports are the product of a Working Group formed in response to the recent financial turmoil, comprised primarily of those countries most directly affected by the crisis. Among others, the IMF, The (US) President’s Working Group on Financial Markets, the EU, the Japan Financial Services Agency and the agencies of other G-20 member countries have also put forward a range of recommendations, many overlapping with those provided in the FSF report. In a report with a national focus, the UK authorities have published recommendations on how they should deal with banks facing financial difficulty or failure; some of these recommendations may be more broadly applicable.

It is important that all G-20 members are engaged in these efforts to improve and broaden regulation and prudential oversight of the international financial system in order to reduce the risk of future crises. While most of the attention has been to date on work being undertaken in developed economies, EMEs are also reviewing the lessons from this financial crisis and the recommendations that have been made.

The following outlines some of the key recommendations being made, drawing most heavily from the FSF report. Since the financial turmoil is not yet over, policy makers may yet need to undertake some further thinking as to how else they may need to respond to the recent financial turmoil. However, the important issue from here is not only one of making the right recommendations, but also how effectively these recommendations are implemented. Implementation is an important challenge, particularly once it is recognised that it entails much more than ticking the boxes. For example, the effectiveness of some of these recommendations can depend on the quality of supervisory staff, as they assess risks and respond in real time.

**Short-term Actions**

The FSF produced an Interim Report at the beginning of the year putting forward some recommendations about what can most usefully be done straight away to ease market stress in developed economies. The policy recommendations had a focus on rebuilding confidence in financial institutions and markets. They included: working towards better disclosure of losses and, along with it, disclosure of valuation methodologies used in determining these losses; supervisors working with institutions to ensure that their capital was sufficient to cover increasing risks; and for central banks to be positioned to respond quickly and flexibly to new developments. Despite progress having been made in these respects, at the time of writing, market pressures still remain, as authorities continue to work on addressing identified weaknesses. The main recommendations are outlined below.

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10 Refer p34, footnote 7 for list of contributors to the FSF Working Group.
11 The reports containing the recommendations can be found at the following links:


Regulation and Prudential Oversight

- Banking regulation needs to be strengthened to ensure adequate capital and liquidity buffers are in place to withstand system-wide shocks, and to ensure sufficient attention is given to risk exposures, particularly those arising in off-balance sheet entities. These measures should be forward-looking and able to adjust appropriately through the credit cycle.

- In the first instance, implementation of the Basel II regulatory framework should be progressed with priority as it addresses some of the outstanding issues under the existing framework, particularly in relation to strengthening treatment of off-balance sheet entities. In some EMEs, implementation of Basel II is likely to occur over a longer timeframe, a fact which increases the importance of early implementation of those areas that address some of the recently identified weaknesses. Brazil’s implementation of Basel II is an example of a sequenced approach which is tailored to local conditions and focuses on building capacity in local institutions as a prerequisite to implementation of some of the more sophisticated provisions of Basel II (refer Box D).

- An additional question is how Basel II should be modified to further counter the weaknesses that have been identified. These are issues that the BCBS has set about to work on. Some current recommendations include:
  
  — A higher capital charge on complex structured finance products;
  
  — Additional capital requirements for credit exposures in the banks’ and securities firms’ trading books; and
  
  — Stronger capital requirements on liquidity facilities provided to off-balance sheet entities.

Some areas for consideration include:

  — The overall adequacy of capital buffers under Basel II, particularly in light of recent experience. Basel II is expected to lead to lower capital requirements for more sophisticated institutions which supposedly should be better placed to manage their own risks. However, while recent events do not overturn this principle, some consideration should be given to the adequacy of capital buffers across the entire system.

  — The outstanding concern that Basel II might be procyclical in nature.

- Supervisors may need to use the latitude available to them under Basel II to address some of these outstanding concerns. Adjustments may be required to risk parameters or other provisions within the framework to ensure that incentives remain appropriate and to ensure the overall sufficiency of capital levels.

- Key lessons for supervisors from recent events include the need to remain attentive to the emergence of new risks, particularly in the face of rapid financial innovation. To do this, supervisors will need to ensure they have the capacity and competencies to keep pace with new financial innovations and the risks they may entail. They need to communicate at an early stage concerns they have about emerging risks and should be more pro-active in addressing these.

- Supervisors should review the role they have assigned to credit ratings in their regulatory frameworks. They should ensure that their treatment differentiates between ratings for corporate bonds and structured finance products.
• Insurance supervisors should review the capital and regulatory requirements placed on monoline insurers. These should be strengthened as necessary to ensure they are prudent and sufficient to avoid market dislocation.

**Box D: A Brazilian Case Study**

Brazil announced its roadmap to Basel II in 2004 and, in July 2008, the standardised approaches for credit, market and operational risk came into force. First Pillar 3 reports are expected in 2009. Advanced approaches will be implemented gradually: market risk in 2009, foundation internal ratings-based (IRB) approach in 2010, advanced IRB approach in 2011 and Advanced Measurement Approaches (AMA) for operational risk in 2012. In implementing Basel II, Brazil has prioritised enhancing the risk management requirements for financial institutions, prior to allowing them to move forward to internal models and methodologies. Regulation has already been issued regarding liquidity risk, market risk and operational risk, with similar qualitative regulation regarding credit risk scheduled for 2008.

In addition, some aspects of Basel II were revised before implementation, such as reduced risk weights for housing loans: in Brazil, the eligibility for such reduced risk weights is linked to the loan-to-value ratio of the transaction at the time of concession. For market risk, regulatory multipliers were applied to the standardised capital requirement for interest rate risk in the trading book, as the 1996 Amendment parameters were found to be inadequate to local and current market conditions. Exposures to some highly leveraged institutions have also been dealt with in the Basel II framework – exposures to funds, for instance, are risk weighted according to the risk of the underlying asset for all risk factors. There are specific limits for interbank business and insurance companies are considered non-financial counterparties for the effect of risk weight (100 per cent risk weight) and client-exposure limits.

Securitisation is still not significant in Brazil. However, with the partial adoption of International Accounting Standard 39 in 2009, all sorts of risk retention, including via securitisation, will require operations to be kept on balance sheet, with the respective risk requirements and provisions. In addition, all capital requirements and controls in Brazil are applied on a consolidated basis that includes non-financial subsidiaries in a banking group, so that most special purpose vehicles (SPVs) and other vehicles are consolidated for supervisory purposes. Full convergence with International Financial Reporting Standards will be concluded in 2010.

Banks in Brazil are already required to hold significant liquidity reserves. In addition, on 1 July 2008, the Central Bank issued new regulations requiring more comprehensive liquidity risk information from financial institutions, so that when new BCBS guidance is published there will be more robust data to support further decisions by the authorities. All over-the-counter derivatives must be registered, with this information being available to all stakeholders. The authorities have stressed their commitment to continuous monitoring of market developments and enhancement of regulations as needed and in line with international recommendations. For example, in May 2007, prior to the onset of the financial turmoil, the Central Bank issued regulations that sought to factor cross-border risk within conglomerates into capital requirements. These early measures are seen as having been fundamental to insulating domestic markets from the international turmoil.

**Risk Management Practices**

• Financial institutions need to improve their risk assessments and stress testing procedures. A number of areas have been identified for review. These include their assessments of concentration risks and liquidity risks, particularly in terms of how they might interact in the event of a system-wide shock. Management information systems should allow exposures across all business lines to be able to be identified and aggregated. Rigorous procedures should be in place for the valuation of instruments and exposures across the business. Compensation policies should ensure that business units do not have incentives to inappropriately build up risks.
• Financial institutions and their supervisors need to ensure the adequacy of stress testing. Unlikely but extreme situations (so called ‘tail events’) are by definition outside the range of usual experience meaning that adequate, realistic scenarios are difficult to identify. Recent events have highlighted the need to give greater consideration to adverse correlation between factors during an extreme scenario and to give greater consideration to liquidity shocks and system-wide events.

• Financial institutions and supervisors also need to cover risk exposures to off-balance sheet vehicles, and give attention to exposures that might arise because of reputational risks rather than just from contractual obligations.

• Overseers of institutional investors (for example, state treasurers for public pension funds) should require these institutions to obtain better information about the risk characteristics of the assets they are investing in. This should improve not only internal decision making but also contribute to market discipline.

**Standards for Valuations and Disclosures**

• Financial institutions should be encouraged to improve disclosures about risk exposures, risk management and accounting treatments, particularly in relation to those products that are now understood to have contained more risk than previously thought. These include, in particular, collateralised debt obligations, residential and commercial mortgage-backed securities and other special purpose entities, as well as for leveraged finance. Specific recommendations for disclosures are outlined in the FSF report. The BCBS are issuing guidance on strengthening disclosures under Pillar 3 of Basel II.

• Accounting standards need to be improved, particularly in relation to disclosures of risks associated with off-balance sheet vehicles. At present, exposures to off-balance sheet vehicles are not made plain under all accounting frameworks, and differences in international standards currently mean that there isn’t a level playing field for financial institutions on this issue. For these reasons, convergence in international standards should occur at an accelerated pace.

• Fair value accounting was tested during recent events, suggesting improvements need to be made in how it is applied during periods of market stress. Current recommendations are for fair value accounting to be improved by: ensuring best practice is employed in modelling financial product values; rigorous and timely processes in recording valuations; improved guidance on valuing when markets aren’t active; and making disclosures about methods, price verification processes and uncertainty regarding the valuations. This work is being led by the International Accounting Standards Board. As an initial step, the IASB has amended its guidelines for valuation to a ‘cost’ basis for financial instruments that a company has both the capacity and the intention of holding for the foreseeable future.

• Guidance for auditing of fair value accounting should also be reviewed, with work currently being led on this by the International Auditing and Assurance Standards Board.

• Investors, industry representatives and auditors should meet regularly to review key risks and disclosure requirements.

**Market Structure and Products**

• The over-the-counter market should be strengthened. A ‘cash settlement protocol’ should be introduced for obligations arising from a credit event, to replace the traditional requirement to physically deliver the underlying asset or instrument. When physical delivery is required, it can contribute to market dislocation since often there may exist more contracts than underlying instruments.
• The operational side of the over-the-counter market should be improved and greater progress should be made in automating the infrastructure, and the timeliness of trade confirmations. This should be done to address backlogs of unconfirmed trades, which can be particularly problematic during periods of market stress.

• The shape of structured finance products into the future requires some careful consideration, particularly with regards to improving the transparency and liquidity of these products. Industry could consider standardising structured finance products, where there is scope to do so, and consider placing them on organised exchanges, rather than in the over-the-counter market.

• Transparency could be improved throughout the securitisation chain. More information should be provided on structured finance products to investors and credit rating agencies on an initial and ongoing basis. This information should include initial underwriting standards and the evolving composition and credit risk characteristics of the pool of assets underlying the product. The industry should consider revealing post-trade information on prices and volumes of trades undertaken in the secondary market.

**Credit Ratings and Credit Rating Agencies**

• Credit rating agencies have become more integral to the operation of certain aspects of financial markets in recent years. Credit ratings were necessary for the success of structured finance products, and have been written into regulatory frameworks. Authorities need to work with credit rating agencies to ensure they are provided with the right incentives to provide high quality outputs.

• Credit rating agencies should review all aspects of producing ratings for structured finance products. This should include the methodologies used, verification of data inputs, disclosures about these methodologies and the inputs used, and the timeliness of rating reviews. Steps need to be taken to tackle potential conflicts of interest arising from the issuer-pay approach, which appear to have been more severe for structured finance products. Credit rating agencies are taking steps to improve internal governance, including the operational and legal separation of the rating and non-rating sides of their business, as well as changing employee compensation arrangements so that they are no longer linked to the performance of their business unit.

• Credit rating agencies should clearly differentiate ratings for structured finance products from ratings for other bonds, which could be done by using a different scale or additional symbols. It should convey to the investor that the risk properties of structured finance products are fundamentally different to other bonds. Credit rating agencies are currently reviewing their rating scales in this respect. They could also consider providing content with regards to the liquidity risk associated with these instruments.

• In the future, they should seek to review whether new products fit within existing scales or where new rating information needs to be developed. Furthermore, they should refrain from rating products in cases where the information could be misleading, the product is overly complex or there is insufficient underlying data.

• Credit rating agencies should publish, on a regular basis and in a timely fashion, easily comparable historical data on credit ratings to enable their performance to be assessed, enhancing competition between the agencies.

• The EU Commission has proposed a registration and external oversight regime for credit rating agencies operating in the EU, whereby regulators would supervise the policies and procedures followed by credit rating agencies and promote reforms to their internal governance.
• The International Organization of Securities Commissions (IOSCO) recently revised the code of conduct for credit rating agencies, calling for significantly more disclosure on their rating methodologies, conflicts of interest, ratings performance, and some of the underlying information used in developing a rating.

• Investors, for their part, should not substitute credit ratings for due diligence on products. Where investors do not have the resources or necessary information available to them to assess risks, they should not invest in that product.

**Tools for Dealing with Financial Stress**

• Recent financial stress has highlighted some areas where central banks and other authorities could improve their frameworks. Currently, there are significant differences in the frameworks used by different countries, although all seem to have been able to be modified successfully to deal appropriately with recent stresses. Consideration needs to be given as to how the following principles are best applied in practice in each country.

• Central banks, where appropriate, should review their operational frameworks in providing frictional liquidity to the market.
  - They should ensure they can quickly and flexibly inject substantial liquidity into the market without undermining their monetary policy settings for any significant period of time.
  - If the circumstances require it, they should have the capacity to undertake frequent operations against a wide range of collateral and across a range of maturities.
  - Frictional liquidity should be provided in a manner that does not have excessive stigma attached to it or necessitate the disclosure of counterparties. The latter may require legislative and other changes to current disclosure arrangements.
  - To assist liquidity in foreign currency, central banks should consider setting up swap lines between themselves, and broadening the range of collateral to include cross-border assets or accept foreign currency in their own liquidity operations.

• Authorities should strengthen their arrangements for dealing with institutions under financial stress.
  - Authorities should clarify the respective division of responsibilities in the event that a bank faces financial stress or fails, have procedures in place for the sharing of information and the coordination of their respective roles, and have a means by which disputes can be resolved.
  - Deposit insurance is recommended by the FSF as it can stave off a bank run and limit the need for central bank intervention. It also contains the cost of a failing institution and provides an orderly process for resolution. It requires certain features to be effective, including a quick payout of claims in the event of a bank default. However, full coverage of deposits can lead to moral hazard problems for consumers. To be effective, whatever the arrangements, they require consumers to have confidence in them. International principles should be reviewed for deposit insurance schemes.
  - Authorities should have sufficient tools at hand to ensure the orderly resolution of a failing institution. These might include the ability to appoint a restructuring officer or, if necessary, have the power to take control of some or all of a bank’s assets and liabilities. Preferably, resolution should occur in such a way that shareholders bear the main burden of adjustment.
Previous G-20 Work

In considering future work for the G-20, it is useful to understand some of the work that has been undertaken in the past. The recommendations made above once again emphasise the importance of robust institutional structures and sound prudential supervision for reducing the likelihood of financial crises and mitigating its costs. Developing and improving institutional structures and prudential supervision was a focus of G-20 work in 2003-04, and it may be timely to consider renewing this work in the light of recent events.

Ongoing Work

Work on these issues is continuing in international fora, including in all the aforementioned organisations. For example, in April, the FSF identified recommendations that should be implemented with priority within 100 days (a timeline that is now past). Work continues to progress on particular issues within member institutions of the FSF and by the FSF Working Group as well. FSF members presented its Follow-up Report on Implementation at a G7 meeting in October. In light of recent developments, the FSF has now called for the implementation of some measures to be accelerated, and will seek to address some additional issues. Some examples of implementing the FSF recommendations within the G-20 are provided in Box E.

The EU Commission is working to ensure that the ECOFIN ‘Roadmap’ is delivered on time, including concrete initiatives on enhancing transparency for investors, markets and regulators, revised capital requirements for banking groups and the regulation of credit rating agencies. In addition, the EU Commission is actively contributing to several initiatives aimed at strengthening the EU supervisory and crisis management framework. For instance the EU Commission has already proposed revisions to the Capital Requirements Directive and to strengthen the existing Deposit Guarantee Schemes Directive in October, and will table a proposal on Credit Rating Agencies in November 2008. It has also prepared modifications to accounting rules to allow for the transfer of assets from the trading book to the banking book and is committed to take forward work on the transparency of executive pay. Moreover, it has adopted an accelerated procedure when considering the compatibility of national rescue measures with EU State Aid rules. One of the Commission’s top priorities is to work on reforming and strengthening the EU regulatory and supervisory framework for financial services in the light of the current crisis. A High Level Group has been set up and the EU also strongly supports the coordination of crisis responses at the international level, including with EMEs.

Many EMEs are now taking the opportunity to review the recommendations that have been put forward, particularly those contained in the FSF report. For example, in Asia and sub-Saharan Africa, the FSF recommendations are likely to feature on the work programmes of a number of regional bodies that cover the supervision of banks and non-banks. The FSF recommendations are also being reviewed at the national level for many countries (as discussed further in Box E). Much of the EME work reviewing the FSF recommendations is yet to come. However, the following are suggested as possible items of relative priority:

• Assessing the adequacy of bank capital, particularly with regards to ensuring banks hold adequate capital against both credit and liquidity risks. Banks with relatively weak capital positions should be required to increase their capital levels.

• Supervisors should pay increased attention to credit quality, particularly in those countries that have experienced strong credit growth. They would be advised to revisit consumer protection provisions and, where appropriate, seek to harmonise the regulatory requirements imposed on bank and non-bank lenders.

• Supervisors should be attentive to risks in off-balance sheet entities and the Basel Committee’s risk-based capital standards should be adopted. Notably, many EME supervisors have been attentive to the risks that can emerge in off-balance sheet entities already.
Box E: Implementing the FSF Recommendations

This Box provides some examples of approaches being taken among G-20 members to the five areas identified by the FSF as requiring concrete actions, bearing in mind that not all measures are relevant as yet for all G-20 members.¹

In the context of the EU, a specific roadmap is being implemented, with actions to improve transparency, valuation, supervision and market functioning, that are broadly consistent with the FSF recommendations.

1. Strengthened prudential oversight of capital, liquidity and risk management

Implementation of Basel II is a key component of the response, with most developed economy G-20 members having already implemented the Basel II framework or being well advanced in their planning. In EMEs, Basel II is being phased in by a number of members, while others are still in the preparatory stages. Brazil is an example of a country where the phasing in of Basel II provides a key framework for addressing the financial turmoil (refer Box D). A focus for some members is strengthening prudential rules for structured credit and securitisation activities. In the EU, Basel II has been implemented via the Capital Requirements Directive (CRD), and its ongoing revision is a key element of the EU’s crisis reaction roadmap. In India, complex structures such as synthetic securitisations are not currently permitted, and the regulatory structure would need to be adjusted before these could be introduced. G-20 members are also continuing to explore issues regarding the procyclicality of the Basel II capital framework, an area which is being addressed at a high level by an FSF working group and may also be the subject of future work by the CGFS. In India, procyclicality has been addressed since 2005 by raising provisioning requirements in response to high credit growth. France has addressed this issue to some extent as well.

Liquidity risk management is another area of particular interest to members. In South Africa, the supervisory review process, including stress testing, has been enhanced and all relevant risks, including liquidity risk, are being stress tested. In India, liquidity risk guidelines have been refined at the short end. In Brazil, banks are already required to hold significant liquidity reserves; this has been supplemented by new regulation requiring more comprehensive liquidity risk information from financial institutions, so that when new BCBS guidance is published there will be more robust data to support further decisions by the Central Bank of Brazil. In the UK, the Financial Services Authority is currently conducting a review of its liquidity requirements for banks and building societies with a view to addressing practical shortcomings and improving standards of liquidity risk management. At the EU level, the regulatory framework for banks’ liquidity exposures to ABCP conduits and SPVs is reviewed in the context of the CRD revision. The forthcoming Basel principles on liquidity risk management will also be implemented through that revision. As well, the provisions of the European Banking Directive concerning liquidity risk management will be strengthened following the Committee of the European Banking Supervisors’ (CEBS) recommendations issued in June.

In the risk management area, the EU is exploring the need for a wider and stricter concept of concentration risk as part of its review of large exposures. In France, a working group (including both supervisory and private sector representatives) has been set up to define supervisory guidance to strengthen risk management practices. In the US, the President’s Working Group on Financial Markets supported the formation of a private sector group to reassess the implementation of the Counterparty Risk Management Policy Group II’s existing principles and recommendations; in early August,

¹. FSF member countries have provided a detailed report to the FSF on their progress in implementing these recommendations, which fed into a report presented to the G7 in October 2008. G-20 FSF members are Australia (central bank), Canada, France, Germany, Italy, Japan, UK, US and the ECB.
the group issued its recommendations. US banking regulators and the Securities and Exchange Commission (SEC) also are developing common guidance to improve risk management, including concentration risk, liquidity risk, and stress testing practices. In Russia – in the lead up to Basel II – measures are being taken to introduce standard approaches to credit risk evaluation and a basic indicator approach to assessing operational risk. There is also a strong focus on risk-based supervision, with priority areas including transparency of ownership, assessment of management quality and internal controls. In addition, improvements are being made to stress testing and monitoring capacity, supported by IMF and World Bank initiatives such as the Financial Sector Assessment Program and Financial Soundness Indicators compilation. In Brazil, regulation has been issued regarding guidance and best practice for liquidity risk, market risk, and operational risk, with credit risk regulation scheduled for 2008.

2. Enhancing transparency and valuation

Risk disclosure is a key issue for a number of members. At the EU level, for example, the CEBS issued recommended best practices which aim at comparable disclosures of European banks’ exposures for the accounting period ending on 30 June 2008. In France, a working group has been set up to translate the Senior Supervisors’ Group leading disclosures practices to the French system. In the US, the SEC, the banking regulators, and the Financial Accounting Standards Board are reviewing fair value accounting standards and guidance; the SEC held a public roundtable on valuation in July, and US authorities are engaged in efforts to enhance the disclosure of off-balance sheet entities. In Japan, Japanese deposit-taking institutions’ exposures to subprime and non-subprime-related structured products (such as CDOs, RMBS, CMBS and leveraged loans) have been published and Supervisory Guidelines revised to encourage financial institutions to make voluntary disclosures and strengthen risk management. In Russia, significant effort is being expended on improving the information available on the banking sector. In India, a working group is looking into supervisory frameworks for SPVs/Trusts set up by banks. Valuation of illiquid assets is a clear concern, and the EU has agreed on a common approach to the accounting valuation of illiquid assets in the context of the publication in June of CEBS’ recommendations on valuation practices.

3. Changes in the role and uses of credit ratings

The role and regulation of credit rating agencies is being addressed by a number of members. Examples include Australia where a formal review is being conducted. In South Africa, for the purpose of Basel II implementation, three rating agencies have been assessed and could be reassessed when deemed necessary, which is in line with FSF recommendations. At the G-10 level, a working group of the Committee on the Global Financial System (CGFS) has been set up on credit rating agencies. At the EU level, a regulation which foresees European registration and oversight of rating agencies by the Committee of European Securities Regulators will be proposed in November. Work is also being undertaken on the use of ratings by investors and regulators, such as in Canada, France, India and the US. India has put in place detailed processes for the use of ratings by banks which, inter alia, prevent ‘cherry picking’ of the assessments provide by different agencies. In the US, the SEC issued three sets of proposed rules to: address conflicts of interest of credit rating agencies; increase disclosure by credit rating agencies of the assets underlying products they rate, their ratings actions and performance measures; and encourage the differentiation of ratings for structured products.

4. Strengthening the authorities’ responsiveness to risks

Supervision of cross-border financial groups is a common concern among members, with strong interest shown in the use of ‘supervisory colleges’. South Africa has already hosted and participated in several supervisory colleges and India has established a working group on cross-border supervision and supervisory cooperation with overseas regulators (also looking at supervisory colleges). As part of this process, India is
consulting widely with other regulators. In the EU, measures to reinforce financial stability arrangements and the supervision of cross-border financial groups are key initiatives set out in separate roadmaps and a High Level Group has been set up to further reform and strengthen the EU regulatory and supervisory framework. In the US, the banking regulators and the SEC are participating in the work of the international Senior Supervisors Group to exchange information on the risk practices of large global financial institutions and in the efforts to develop colleges of supervisors under the auspices of the FSF. Australian banks have a dominant presence in New Zealand and accordingly, Australian authorities are continuing to strengthen cooperation with their New Zealand counterparts on crisis management arrangements.

Work is also underway on enhancing cooperation at the international level. The IMF and the FSF are enhancing their interactions: other initiatives included a meeting between the IMF and FSF with G-20 and other key countries in October. The UK has called for joint delivery by the FSF and IMF of an early warning system report, as part of a global early warning system on the threats to financial stability and the global economy from the international financial system. Against the background of the UK proposal, the G8 is discussing how to further strengthen cooperation between the IMF and the FSF on reinforcing early warning capabilities. Australia supports improved early warning capabilities, including through enhancing cooperation between the IMF, FSF and the G-20.

5. Robust arrangements for dealing with stress in the financial system

The financial turmoil has seen concerted intervention by developed economy central banks to maintain system liquidity. For example, in the US, since August the Federal Reserve has implemented a series of changes to its lending facilities, including, but not limited to, the introduction of the Term Auction Facility, the Term Securities Lending Facility, the Primary Dealer Credit Facility, the Commercial Paper Funding Facility and the Money Market Investor Funding Facility to help improve market liquidity and overall market functioning. In Russia, the central bank employed a range of measures to maintain system-wide liquidity, which included extending the range of collateral, lowering the reserves ratio and enhancing existing refinancing instruments.

At the EU level, Finance Ministers and Central Bank Governors agreed a new Memorandum of Understanding in April 2008 on cooperation in financial crisis situations, which included enhanced cooperation in the undertaking of regular stress testing and crisis exercises and a commitment to set up frameworks for the management of a cross-border crisis. Moreover, the mid October European Council has installed a ‘financial crisis cell’ to facilitate the exchange of information at the highest level.

In the UK, the deposit compensation scheme is being enhanced, with the EU also looking at possible enhancements to existing Deposit Guarantee Schemes. In Australia, a Financial Claims Scheme is being established to enable timely access to depositors’ funds and new arrangements are also being put in place for dealing with distressed banks, including legislation to facilitate the recapitalisation of failing entities.

- Financial institutions should be encouraged to improve internal risk management. In particular, they should be encouraged to improve their infrastructure to enable them to assess risk across the whole entity. Greater consideration should be given to liquidity risks, and stress-testing practices should be improved. Supervisors could also consider improving the stress-testing exercises they undertake in relation to potential system-wide events.

- Given the importance of credit ratings within the Basel II framework, some consideration could be given to reviewing whether credit rating agencies had heeded the FSF recommendations.

- The relevant government authorities should review the procedures available for dealing with weak and failing banks. They should seek better sharing of
information between central banks and supervisors. This can be facilitated, in part, by the production of Financial Stability Review reports (as produced already by many EMEs). They should ensure that appropriate arrangements are in place between the respective authorities and that they have adequate tools to use to ensure an orderly resolution of a failing bank. As needed, they should reinforce cross-border supervisory cooperation.

The FSF recommendations are of most immediate relevance for developed economies since these countries have been more directly affected by the recent financial turmoil. Nevertheless, it is also important for EMEs to take into account most of the proposed recommendations as a way to possibly prevent future national crises. It is also relevant to consider that the consequences of the financial turmoil on EMEs have been rather diverse.

5.2 International Policy Coordination and Cooperation

As financial institutions and markets are becoming more global in nature, international authorities – both policy makers and supervisors – are increasingly required to take a cooperative and coordinated approach in order to deal effectively with episodes of financial stress. The role for international cooperation needs to be considered both in the context of managing the current situation, and with respect to mitigating the risks of future financial crises and building a more resilient and robust global financial system. Recent events have drawn attention to several areas where international cooperation may be called for, including: the provision of liquidity in international markets; the provision of economic stimulus through monetary policy actions or government measures; potential cross-border issues that may arise when financial institutions with international operations come under financial stress or fail; and the relevant roles for the various international agencies on these issues.

Recent events have highlighted the usefulness of a coordinated approach by central banks in providing liquidity in international markets, particularly as major financial institutions operate globally and manage their liquidity needs on a global basis. Recent coordination included the use of swap lines between the relevant central banks to provide US dollars into the euro area and elsewhere, thus delivering liquidity in a form that was needed at the time. Other forms of international cooperation aimed at providing support to the financial system and bolstering economic growth have included coordinated rate cuts. Some recommendations in this area are mentioned in the section above. For other government measures, issues can arise in the sequencing of their introduction across countries, as was seen in the recent experience with countries introducing deposit insurance and guarantees on bank senior debt. An issue for cooperation is how such measures will be withdrawn, which may require a coordinated approach.

Also, authorities may need to contend with a range of cross-border issues when financial institutions with international operations face financial difficulty or failure. These issues are likely to have become more significant over time with the ongoing trend towards financial consolidation and the associated emergence of large global financial conglomerates. Cooperation between national authorities may be required to get a full picture of the health of an institution, and a swift coordinated approach may be required in taking remedial action or indeed organising the orderly resolution of the institution. Issues may arise, for example, in the imposition of legal jurisdictions and asset transfers across international borders.

Recommendations on cross-border coordination include enhanced information sharing between relevant national authorities when cross-border institutions are facing financial stress. For larger institutions, information sharing should occur ahead of adverse events. For the largest global financial institutions, it has been recommended that small interest groups of the most directly involved supervisors meet regularly to discuss potential coordination and crisis management issues. As well, there could be benefits of
discussions in relevant global fora with a view to identifying ‘good practices’ of crisis management that are of wide international relevance.

Finally, there are questions as to the respective roles that international organisations should take in identifying and responding to global systemic events. A particular question is how the relevant international bodies such as the FSF, IMF and G-20 should coordinate their efforts. The FSF and IMF have agreed to closer coordination of their efforts. The IMF has agreed to report its findings on financial stability risks to FSF meetings, and in turn seek to incorporate relevant FSF findings into its surveillance work. The UK has called for even closer cooperation between the IMF and FSF, including calls for a joint report on the risks and response to financial stability. The G-20, which brings together systemically important economies, is also well positioned to play an important role in promoting global financial stability.
REFERENCES: KEY MATERIAL SUBMITTED BY STUDY GROUP


HM Treasury (2008), Financial Stability and Depositor Protection: Cross-border Challenges and Responses.


International Monetary Fund (2007), 'Decoupling the Train? Spillovers and Cycles in the Global Economy’, World Economic Outlook, April, Chapter 4, 2007.


International Monetary Fund (2008c), Global Financial Stability Report, October.


International Monetary Fund (2008j), World Economic Outlook, October.


## ANNEX A: STUDY GROUP MEMBERS

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**Abbreviations**

ABCP – Asset-backed commercial paper

ABS – Asset-backed securities

AMA – Advanced Measurement Approaches

ASEAN+3 - Association of Southeast Asian Nations (+ 3 refers to China, Japan and the Republic of Korea)

BCBS – Basel Committee on Banking Supervision

BIS – Bank for International Settlements

BoE – Bank of England

CEBS – Committee of European Banking Supervisors

CDOs – Collateralised debt obligations

CDS – Credit default swap

CDX – A credit default swap index containing North American and emerging market companies

CGFS – Committee on the Global Financial System

CLOs – Collateralised loan obligations

CPFF – Commercial Paper Funding Facility

ECB – European Central Bank

ECOFIN – Economic and Financial Affairs Council for the European Union


EMEs – Emerging market and newly industrialised economies

EMEAP – Executives’ Meeting of East Asia-Pacific Central Banks

EU – European Union

EU-15 – The first 15 countries in the European Union

FASB – Financial Accounting Standards Board (US)

FDIC – Federal Deposit Insurance Corporation

FSF – Financial Stability Forum

G7 – Group of Seven

G8 – Group of Eight

G-20 – Group of Twenty

GDP – Gross Domestic Product

GSEs – Government Sponsored Entities
IASB – International Accounting Standards Board
IOSCO – International Organization of Securities Commission
MBS – Mortgage-backed securities
MSCI - Morgan Stanley Capital International – emerging market stock index
MMIFF – Money Market Investor Funding Facility
IFRS – International Financial Reporting Standards
IMF – International Monetary Fund
IMFC – International Monetary and Financial Committee
IPOs – Initial Public Offerings
IRB – Internal ratings-based
Libor – London interbank overnight rate
OIS – Overnight indexed swap
PDCF – Primary Dealer Credit Facility
RBA – Reserve Bank of Australia
SNB – Swiss National Bank
SLS – Special Liquidity Scheme
SPV – Special purpose vehicle
TAF – Term Auction Facility
TARP – Troubled Asset Relief Program
TSLF – Term Securities Lending Facility
UK – United Kingdom
US – United States