

EXECUTIVE SUMMARY

Since the April 2007 *Global Financial Stability Report* (GFSR), global financial stability has endured an important test. Credit and market risks have risen and markets have become more volatile. Markets are recognizing the extent to which credit discipline has deteriorated in recent years—most notably in the U.S. nonprime mortgage and leveraged loan markets, but also in other related credit markets. This has prompted a retrenchment from some risky assets and deleveraging, causing a widening of credit spreads in riskier asset classes and more volatile bond and equity markets. The absence of prices and secondary markets for some structured credit products, and concerns about the location and size of potential losses, has led to disruptions in some money markets and funding difficulties for a number of financial institutions, as some counterparties have been reluctant to extend credit to those thought to hold lower quality, illiquid assets. The resulting disruption has required extraordinary liquidity injections by a number of central banks to facilitate the orderly functioning of these markets.

The potential consequences of this episode should not be underestimated and the adjustment process is likely to be protracted. Credit conditions may not normalize soon, and some of the practices that have developed in the structured credit markets will have to change. At the same time, the global economy entered this turbulent period exhibiting solid growth, especially in emerging market countries. Systemically important financial institutions began this episode with adequate capital to manage the likely level of credit losses. So far, despite the significant ongoing correction in financial markets, global growth remains solid, though some slowdown could be expected. Downside risks have increased significantly and, even if those risks fail to materialize, the implications of this period of turbulence will be significant and far

reaching. Eventually, lessons for both the private sector and the regulatory and supervisory arenas will have to be drawn in order to strengthen the financial system against future strains.

The threat to financial stability increased as the uncertainty became manifest in the money markets that provide short-term financing (especially commercial paper markets). At the center of the turmoil is a funding mismatch whereby medium-term, illiquid, and hard-to-value assets, such as structured credit securities, were being funded by very short-term money market securities—often asset-backed commercial paper. The market illiquidity and the difficulty in valuing the complex, structured products held as assets has compounded the risks of the funding mismatch. Thus, while potentially helping protect the financial system from concentrations of credit risk in banks, the dispersal of structured credit products has substantially increased uncertainty about the extent of the risks and where they are ultimately held.

This funding mismatch was undertaken by a significant number of conduits and special purpose vehicles that had assumed they could hold their illiquid assets to maturity. Many have been associated with regulated banks, and to a large extent their funding strategies were backed by contingent liquidity lines from those banks. When doubts about the quality of some of the underlying assets emerged and the high ratings were perceived as less reliable, prices of the assets fell, the rollover of associated asset-backed commercial paper became very difficult, and funding began to be squeezed. As a consequence, what had been contingent, off-balance-sheet liabilities for regulated banks threatened to move “on balance sheet.” The funding difficulties were first felt in Europe and, subsequently, in a number of other places. The rapid transmission of disturbances in one part of the financial system to other parts, sometimes

through opaque and intertwined channels, has surprised both market participants and the official sector. The uncertainty about where off-balance-sheet bank exposures will materialize next has led to a tiering of interbank lending rates. Banks that are believed to either have structured credit product losses, or that need to satisfy contingent credit lines to their conduits or special purpose vehicles, face higher interbank rates. In some cases, the flows in the interbank market are stymied by some large banks' desire to hold onto liquidity in case they need to finance other activities, such as the large pipeline of leveraged buyouts scheduled for the remainder of the year. Overall, there has been a sharp rise in perceived counterparty risk, and a desire to keep the additional liquidity on hand, at least for now.

The April 2007 GFSR flagged the underlying causes of the current correction. The weakening of credit discipline and the potential complacency, which were highlighted in that edition, led to a buildup of credit risks in the U.S. mortgage market, leveraged buyout market, and some lending to emerging markets. The benign economic and financial conditions of recent years weakened incentives to conduct due diligence on borrowers and counterparties. Moreover the "originate and distribute" model used for credit products by many financial institutions meant that many such institutions could choose not to hold the credit risk they originated, reducing their incentives to monitor borrowers. Investors in the distributed securities may have relaxed their due diligence in assessing liquidity and leverage risks or chosen to rely excessively on ratings agencies to analyze risks in complex financial instruments. Stress in the U.S. housing market then weakened mortgage-backed securities, an important component of the global financial system. The resulting multiple credit downgrades of these securities by ratings agencies led to downward pressure on their prices and started to deepen the repricing episode that began some time ago.

Leverage has played a key role in amplifying the disturbances. The ease with which some

banks and other investment vehicles, including hedge funds, were able to borrow against difficult-to-price collateral traded in illiquid markets severely aggravated conditions when market liquidity evaporated, resulting in a process of forced deleveraging at "fire sale" prices and the failure of some funds. Institutions that have suffered the most have had strategies that were based on high levels of leverage and had assumed continued liquidity in secondary markets.

A long period of abnormally low market volatility likely exacerbated the episode. Risk premia in many markets had fallen to historically low levels as more and more investors bet on a continuation of the benign, low-volatility environment. Returns became more correlated. As markets fell, risk premia expanded quickly. Similar risk management techniques, common investors, and similar positions may have exacerbated the situation. Losses were magnified as many market participants tried to exit similar positions simultaneously.

Chapter 1 of this report summarizes the overall assessment of stability using the global financial stability map introduced in the April 2007 GFSR. Extending the work in the last GFSR, the chapter focuses on the fallout from weakening credit discipline in the U.S. nonprime mortgage market and the leveraged buyout market (including the market turbulence of August 2007, which resulted in a drying up of term lending in money markets), and details linkages across markets. The chapter explains how volatility has been amplified by high leverage and how risks are transmitted between institutions. It gathers evidence on where the risks now reside, and what might be the impact on banks, corporations, and households as losses surface.

The chapter also examines the global aspects of the lack of credit discipline. Overall, emerging market risks remain finely balanced, with many countries benefiting from improved macroeconomic fundamentals and better policymaking frameworks. External sovereign debt has been reduced and debt structures are better managed. Nonetheless, offsetting these positive aspects, credit growth has been rapid in a

number of emerging markets, with some banks (both domestic and foreign) borrowing abroad in foreign currency to lend domestically, taking on indirect credit risks through their foreign-currency-denominated loans. In addition, the low yields in mature markets and high risk appetite have allowed emerging market corporates easy access to foreign capital, including through synthetic and structured products to generate higher yields.

Chapter 1 also looks at some of the routes taken by foreign investors to gain access to certain emerging markets where there are capital account restrictions. The chapter cautions that some emerging markets are vulnerable to a pullback in the availability of capital, and that this pullback could continue even after the mature market funding difficulties subside. To understand in greater depth the stability implications of foreign participation in local emerging markets, the chapter provides empirical work on foreign equity flows into several different emerging markets in order to distinguish between institutional investors and others. Lastly, the chapter reviews the growth in the activities of hedge funds in emerging markets.

Chapter 1 also includes an annex exploring some aspects of sovereign wealth funds (SWFs). The growth of these entities can be seen as the result of the strong accumulation of foreign assets by the official sector—in part, due to high natural resources prices or prompted by large balance of payments surpluses and capital inflows. SWFs are becoming an important investor group, and questions have been raised about the impact of their cross-border asset allocations. The annex attempts to clarify some of the discussion surrounding their structures and goals by providing a taxonomy of sovereign wealth funds and their asset allocation frameworks.

Although the recent episode of turbulence is ongoing, and it is too early to make definitive conclusions, it is already clear from the analysis in Chapter 1 that several areas will require increased attention. The first is the important role of uncertainty and lack of information. Accurate and timely information about underly-

ing risks are critical components in the market's ability to differentiate and properly price risk. This would include both qualitative and quantitative information about how risks are managed, valued, and accounted for, especially in areas of risk transfer. Greater transparency is also needed on links between systemically important financial institutions and some of their off-balance-sheet vehicles. Only by disclosing fully their interrelationships with asset managers, conduits, and special purpose entities will investors be able to assess the true creditworthiness of the institutions with which they deal. However, given the volume and complexity of the information that could potentially be provided, and the cost of providing it, it will be important to carefully consider the appropriate amount and type of disclosure needed to alleviate the problems evident in this episode.

Second, while securitization, and financial innovation more generally, through enhanced risk distribution have made markets more efficient, there is a need to understand how they may have contributed to the current situation. In particular, it is important to consider the extent to which the incentive structure, in the context of very benign times, may have diluted the incentives for originating lenders to monitor risk. In the U.S. mortgage market, the public sector costs associated with the lack of supervisory oversight of some mortgage originators will need to be balanced against the improved access to credit that some households received. Generally, the relationship between checks and balances throughout the supply chain of structured products may require some rethinking.

Third, there is a need to examine risk analysis of credit derivatives and structured products and the role of ratings agencies. Ratings and ratings agencies will continue to be a fundamental component in the functioning of financial markets. However, there is some concern about the rating methodology of complex products, particularly when securities, with very different structures, assumptions, and liquidity characteristics, receive the same ratings. Ratings of complex structured products may have become too connected to

facilitating origination. In periods of turbulence, the rapid downgrades then raise questions about the reliability of these ratings and their usefulness for the investors. We repeat the call from the April 2006 GFSR for a more differentiated scale of ratings for structured products. Investors also have an obligation and responsibility to understand the dynamics and liquidity risks associated with the products they buy—they wrongly assumed that a low probability of default meant a low likelihood of losses from market movements. In the case of complex structured credit products, investors need to look behind the ratings—they should not assume that the simple letter ratings provided by ratings agencies show equivalent risks as those for other asset classes. Differentiation and transparency in the underlying assumptions and construction of the various structures would facilitate appropriate due diligence by investors.

Fourth, the valuation of complex products in the context of a market where liquidity is insufficient to provide reliable market prices requires more consideration. When purchasing complex products, investors will need to consider the associated liquidity aspects and include an appropriate liquidity risk “premium” as part of the price. Financial institutions holding such securities as collateral will need to assign a “haircut” that factors in liquidity characteristics. Importantly, financial institutions need to make sure that they have robust funding strategies appropriately suited for their business model and that such funding strategies can accommodate stressful conditions. More generally, the rapid growth of some illiquid instruments raises questions about whether originators of such securities should be expected to provide secondary markets to contribute to the valuation process.

Fifth, the relevant perimeter of risk consolidation for banks has proved to be larger than the usual accounting or legal perimeters. There are two notable examples: (1) reputational risk may force banks to internalize losses of legally independent entities; and (2) new instruments or structures may mask off-balance-sheet or contingent liabilities. The result is that risks that

appear to have been distributed may yet return in various forms to the banks that distributed them. The relevant perimeter is not only an issue for supervisors, but also for the financial institutions themselves—their risk management systems, audit processes and internal oversight and governance structures.

Policymakers now face a delicate balancing act. They must establish frameworks that encourage investors to maintain high credit standards and strengthen risk management systems in good times as well as bad. Actions should only be undertaken if the public policy benefits outweigh the costs, taking care to thoroughly examine possible unintended consequences. In general, the current regulatory systems have proven resilient to date, and regulators must be continually mindful that households and firms have benefited greatly from the financial innovation and solid growth and financial stability of recent years.

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Chapters 2 and 3 examine two respective issues that are the outcome of the lengthy period of low mature market yields and unusually low financial market volatility over the last several years. Chapter 2 examines the extent to which market risk management methods may have encouraged more risk-taking during this relatively benign period, perhaps resulting in a more rapid withdrawal from risky assets than would otherwise be the case as conditions change. In light of rapid capital flows to emerging market countries, Chapter 3 investigates how countries can best deal with capital flow volatility in the medium term by improving the depth, liquidity, and institutional quality of their domestic financial markets.

Chapter 2 specifically examines market risk management techniques to see whether their common usage, while seemingly prudent for individual institutions, could exacerbate market volatility during periods of stressful market conditions. The question is examined in two ways. The first is by using a stylized version of the most common market risk model, value-at-risk (VaR), which is the estimated loss a firm is

unlikely to exceed at a given degree of confidence. For instance, a firm's one-day estimated VaR of \$10 million at a confidence level of 95 percent implies that the firm would expect to lose more than \$10 million on its portfolio only five days out of 100. A stylized model is used to demonstrate how VaR declines during a lower volatility environment, but rises when higher volatility returns. The stylized portfolios are then "stressed" by examining how VaR would respond with data from previous episodes of financial market turbulence. Lastly, simulations are conducted in which several firms are hypothesized to use the same, or slightly different, VaR models, also during periods of stress. Results suggest that such firms, acting according to their own models to contain risks, could collectively make markets more volatile, especially if risk aversion is low. The simulations also show, however, that a greater diversity of models would help to reduce such potential instability.

Chapter 2 also examines risk management procedures of investment banks and hedge funds to see whether they conform to the preconditions necessary to amplify market volatility in practice. While all firms maintain that they would not rigidly follow their VaR models in stressful circumstances, there are a number of ways in which VaR metrics, or related risk limits, could act to amplify market volatility. In fact, recent turbulence suggests some of these techniques may be contributing to the current turbulent conditions to some degree. Overall, VaR and other risk management techniques will encourage financial institutions to respond more rapidly to changes in risk. Normally, this will facilitate early detection and prompt correction of risks deemed excessive by the institution. However, the use of similar techniques across institutions during periods of stress can lead to larger price movements than would occur if different techniques were used. It is thus worthwhile for regulators and supervisors to acknowledge the benefits of discretion when implementing risk management systems (including new ways to incorporate credit and liquidity risks) and to promote the use of "stress

testing"—encouraging all firms to consider their interactive effects during periods of stress, as some do already. A diversity of investment positions and types of participants is even more important to help stabilize markets. Regulators and supervisors would also do well to consider more concretely than they do now how they would respond to the amplifying effects when individual firms naturally attempt to protect their firm's franchise value.

Chapter 3 empirically analyzes a common view—whether, in addition to strong macroeconomic fundamentals, a well-functioning domestic financial market encourages capital inflows and reduces their volatility over the medium term. A panel estimation technique is used to examine the factors that determine the volume and volatility of annual capital inflows for a sample of developed and emerging market economies from 1977 to 2006. The factors include financial variables such as equity market depth and liquidity and financial openness, and a shorter sample also includes institutional quality variables such as corporate governance quality and accounting standards. The results of the empirical work show that the liquidity of equity markets and financial openness positively influence the level of capital inflows. Moreover, the panel estimations show that more financial openness reduces the volatility of inflows. Separately, the chapter shows that improvements in a broad set of institutional quality variables are correlated with lower volatility.

Chapter 3 also examines how five emerging market countries have coped with the recent rise in capital inflows and discusses some of their policy options. These five country examples reveal the difficulty of finding a common set of financial policies that help deal with capital inflows. Generally, policies that encourage financial market development over the medium term—including a well-regulated system, better transparency and broader institutional quality, and improved risk management for financial institutions—will likely cushion the financial system from the potentially destabilizing effects of abrupt capital outflows better than will short-term fixes.