

# What happened to risk dispersion?

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*The turbulence in credit and funding markets in the second half of 2007 is disturbing evidence that risk dispersion in financial markets has been less effective than expected. Investors appear to have acquired risks that they did not understand. Much more worrisome, however, is the evidence that major financial firms did not succeed in shedding risks so much as in transferring them among their own business lines, resulting in an unintended concentration of risks on their own balance sheets. In order to restore confidence in the near term, and to put credit creation on a more sustainable path in the future, supervisory authorities, central banks and governments will first need to understand why the much-vaunted dispersion of risk fell so far short of expectations.*

*The “reluctance to lend” which underlies these strains in money markets was widely attributed to concerns about the financial condition of borrowers, as a consequence of uncertainty about the value of assets on the borrowers’ balance sheets, and also to insufficient attention to liquidity management by financial firms. But the focus on uncertainty about borrowers ignores the awkward fact that the major financial intermediaries are both lenders and borrowers themselves and their reluctance to lend significantly reflects a defensive reaction to their own uncertainties about their own balance sheets.*

*Better stress testing for liquidity as well as solvency would certainly be beneficial. Yet a major cause of the strains in credit and funding markets has been the apparent inability of many firms to anticipate the interaction of their various on- and off-balance sheet exposures and, particularly, to understand the velocity of their off-balance sheet activities and how these affected their overall exposures.*

*In considering potential remedies to the credit market’s turbulence and to the apparent failure of risk dispersion, the authorities should first reflect on their own role in the trend of pushing risks off of bank balance sheets.*

The turbulence in credit and funding markets since the summer of 2007 is disturbing evidence that risk dispersion in financial markets has been less effective than expected. Investors appear to have acquired risks that they did not understand. Much more worrisome, however, is the evidence that major financial firms did not succeed in shedding risks so much as in transferring them among their own business lines, resulting in an unintended concentration of risks on their own balance sheets. In order to restore confidence in the near term, and to put credit creation on a more sustainable path in the future, supervisory authorities, central banks and governments will first need to understand why the much-vaunted dispersion of risk fell so far short of expectations.

While the general features of the credit cycle are recognizable in the events leading up to August of 2007, the sudden and persistent premium in short-term Dollar, Sterling and Euro inter-bank interest rates has been both a puzzle and a potential threat to the provision of credit to otherwise financially-healthy households and businesses. The "reluctance to lend" which underlies these strains in money markets was widely attributed to concerns about the financial condition of borrowers, as a consequence of uncertainty about the value of assets on the borrowers' balance sheets, and also to insufficient attention to liquidity management by financial firms. These are undoubtedly contributing causes of the elevated funding costs.

But the focus on uncertainty about borrowers ignores the awkward fact that the major financial intermediaries are both *lenders and borrowers themselves* and their reluctance to lend significantly reflects a defensive reaction to *their own uncertainties about their own balance sheets*. Many have focused on shortcomings in liquidity management, and it is a common critique that too much attention has been paid by regulators and others to solvency risks at the expense of liquidity risk. This may be true but too narrowly defines the problem.

Better stress testing for liquidity as well as for solvency would certainly be beneficial. Yet a major cause of the strains in credit and funding markets

has been the apparent inability of many firms to anticipate the interaction of their various on- and off-balance sheet exposures and, particularly, to understand the *velocity* of their off-balance sheet activities and how these affected their overall exposures. At the same time, the major financial intermediaries face the additional uncertainty of more complex accounting rules which might require more off-balance sheet exposures to be consolidated onto their balance sheets.

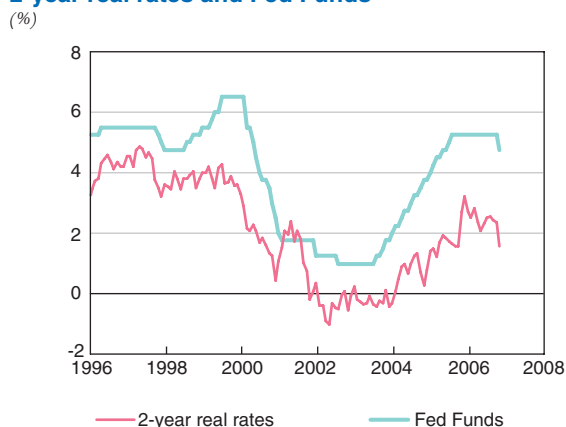
In considering potential remedies to the turbulence of 2007 and to the apparent failure of risk dispersion, the authorities should first reflect on their own role in the trend of pushing risks off of bank balance sheets. Then, before considering changes to the permissive off-balance sheet regime that has evolved, they should weigh carefully the risks of a too-rapid de-leveraging and the possibility of a further, pro-cyclical contraction of credit.

## 1 | THE CREDIT CYCLE

The general features of the credit cycle are easily recognized in the events leading up to and during this summer's turbulence. Accommodative monetary policy, intended to stimulate aggregate demand, has its most pronounced effects on the most interest-rate sensitive sectors of the economy. When the central bank withdraws the accommodation, raising real rates both dampens new activity and decays financial asset values. Higher rates and a flatter yield curve cause lenders' margins to narrow, increasing the risk of credit defaults and reducing demand for loans all at the same time.

In this cycle, global monetary conditions in general and United States monetary conditions in particular were extremely accommodative from 2002 to 2004. Following the events of 9/11, the recession of 2001 and the corporate scandals of 2002 and 2003, the Federal Reserve provided an extended period of monetary accommodation with negative two-year real interest rates for much of 2003 and 2004 (see Chart 1). This stimulated the most interest-rate sensitive sectors of the US economy: housing and leveraged investing.

**Chart 1**  
2-year real rates and Fed Funds

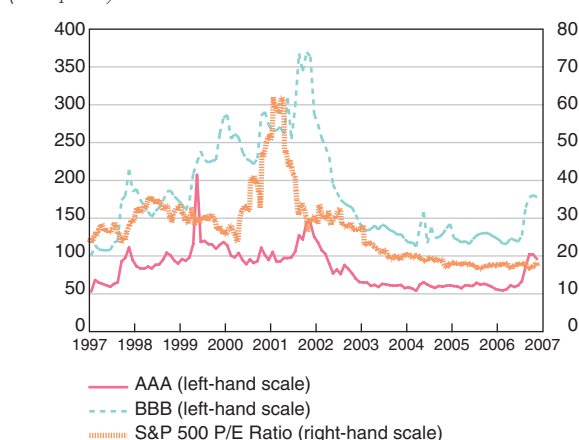


Note: Real 2-year rates: 2-year Treasury minus rate of growth of personal consumption expenditures index.

Sources: Bloomberg, Federal Reserve

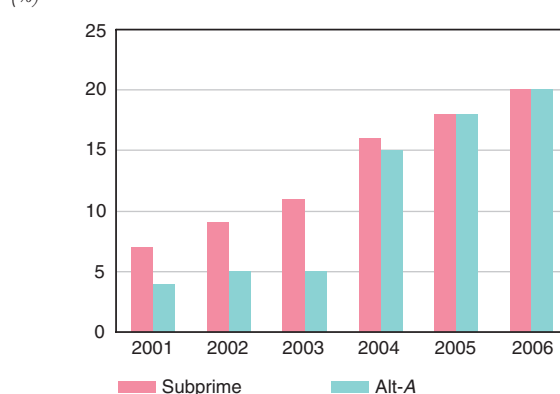
Global markets, following the stock market declines earlier in the decade, had demonstrated a marked preference for fixed-income investments –reflected in ever-tighter credit spreads and relatively low and stable equity price-earnings ratios (see Chart 2). By creating an abundance of credit, monetary policy correspondingly created a scarcity of yield in global capital markets. Subprime mortgages to less credit-worthy residential homeowners represented a “perfect” intersection of supply (given the stimulated housing investment) and demand (from investors searching for yield) (see Chart 3).

**Chart 2**  
Corporate spreads and S&P 500 P/E ratio



Sources: Lehman Brothers, Bloomberg, JP Morgan

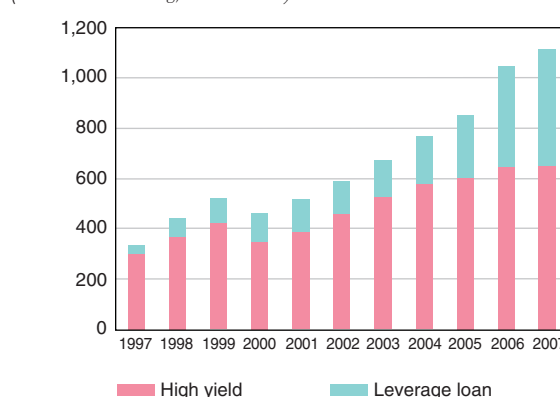
**Chart 3**  
Subprime and Alt-A share of US mortgage origination



Source: Credit Suisse

This constellation of conditions –low real rates, rapid housing investment and demand for mortgages, and investor demand for fixed-income yield– provided an extraordinary stimulus both for leveraged corporate buyouts and the securitization and packaging of credit investment products. Nominal global issuance of credit instruments is estimated to have experienced a twelve-fold increase from USD 250 billion in 2000 to USD 3 trillion in 2006, representing the sum of mortgage-backed securities (MBS), asset-backed securities (ABS), commercial mortgage-backed securities (CMBS) and collateralized debt obligations (CDOs) –which are, themselves, levered investments in mortgages and high-yield corporate debt (see Charts 4 and 5).

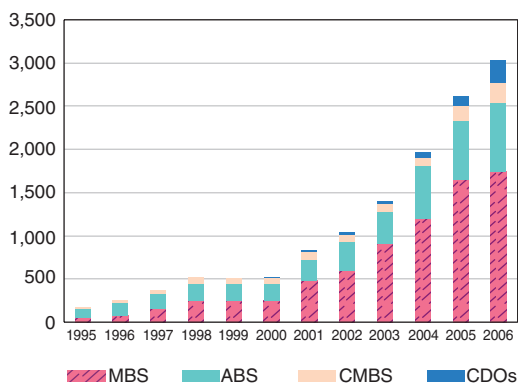
**Chart 4**  
High yield and leveraged loan markets



Sources: Standard & Poor's, Lehman Brothers, BlackRock

**Chart 5**  
**Asset-backed securities and structured credit**

(USD billions)



Sources: Lehman Brothers Fixed-Income Research, Thomson Financial, Bondware, IMF, BlackRock

The disintermediation of traditional balance sheet lending, through the securitization of credit and its transfer to investors through traded capital markets, has been going on since the 1980s. But the expansion of the securitization process in this decade has accelerated the transformation of the financial services industry from one of banks, brokers and insurance companies into one that reflects a division of labor among asset originators, asset distributors, and asset managers. This division of labor, and the growth of capital markets activity which it reflects, necessarily relies upon *funding* and *trading* positions in money and credit markets in order to move assets along the chain of agents.

## 2 | THE SUMMER OF 2007

The abrupt reversal of the credit market conditions in the summer of 2007 followed a sudden shift in monetary policy expectations and real rates that took place in the spring. At the start of 2007, most market participants anticipated a relatively benign path of monetary conditions from central banks. The Federal Reserve had stopped tightening policy in 2006 and was expected to begin easing policy toward the end of 2007; the Bank of England was also expected to be easing policy later in the year; and the European Central Bank was expected to be firming policy but only on a very gradual trajectory.

By May, however, the Federal Reserve showed no signs of easing in the near-term, and futures prices

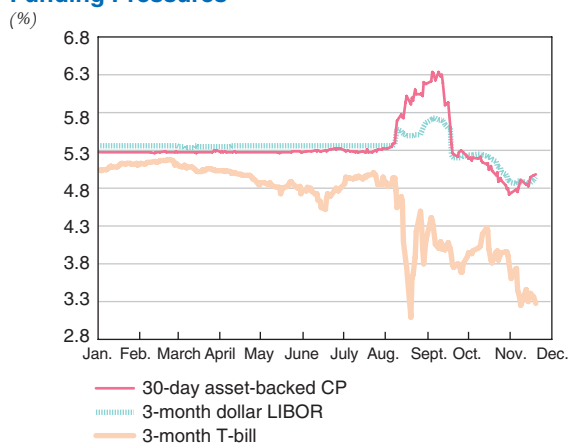
took out any expectations for rate cuts later in the year, which led to an increase in real rates as reflected in inflation-indexed Treasury securities. With poor inflation readings, the Bank of England began raising rates and the ECB was raising rates more deliberately than the market had originally anticipated. This firming in policy expectations and the associated rise in real rates led to a decline in the prices of credit instruments, particularly for securities associated with subprime mortgages.

In response to the decay in prices and the simultaneous rise in volatility, a number of major financial firms began to reduce their credit exposures to hedge funds, provided through their prime brokerage arms. While this may have been a prudent counterparty credit decision, it had the seemingly-unanticipated consequence of reducing demand for the very mortgage-backed securities and structured credit instruments that were being underwritten, packaged and sold to hedge funds and other investors by the major firms' mortgage-origination and investment banking businesses. Falling prices for these riskier, higher-yielding instruments had the predictable consequence of weakening demand which, in turn, caused a backup of inventories in asset-origination pipelines. This occurred most noticeably for subprime mortgage originators like Countrywide and for the investment banks that had commitments for private-equity financings which they had expected to repackage and sell to investors.

A wide variety of investment funds and structured vehicles set up to invest in credit instruments with short-term borrowing came under pressure. Major firms were not immune; in June, Bear Stearns confronted large losses in two hedge funds it had sponsored and, then, in early August, BNP announced that it would freeze three investment funds that it had sponsored. While these two firms garnered the most publicity during this period, there were a number of other investment vehicles, including CDOs, structured investment vehicles (SIVs) and bank conduits, which had entered the same maturity mismatch, funding with short-term asset-backed commercial paper (ABCP) and investing in credit instruments which came under pressure at the same time.

Shortly following the BNP announcement, a classic "flight to quality" began as those investors who had been financing the ABCP market sought to sell their

**Chart 6**  
**Funding Pressures**

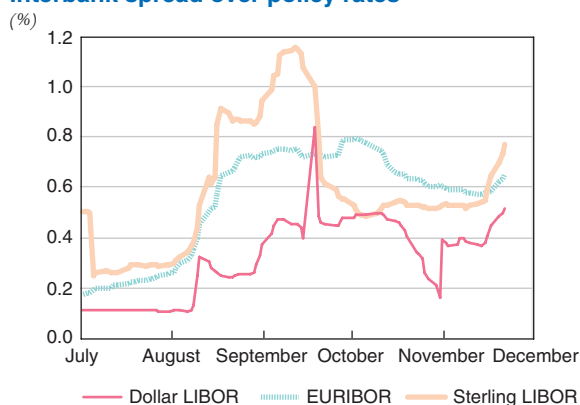


Sources: Bloomberg, BlackRock

ABCP exposures and switch to safer investments, such as short-term government bills, causing an abrupt rise in yields on ABCP and a fall in yields on government paper. As investors expressed an unwillingness to roll over the ABCP exposures, the volume of ABCP being issued began a precipitous decline. Those in need of short-term funding scrambled to find alternatives and borrowing costs began to rise sharply in the short-term Euro inter-bank market as well as in the London inter-bank market for both Sterling and US Dollars (see Charts 6 and 7).

While there were initial differences in their responses (most notably by the Bank of England), the ECB, the Bank of England and the Federal Reserve all eventually responded with the offer of larger than normal injections of reserves. The Federal Reserve has lowered both its Discount Rate and the Federal Funds Rate to reduce short-term borrowing costs.

**Chart 7**  
**Interbank spread over policy rates**



Sources: European Central Bank, Bank of England, Bloomberg

Notwithstanding these efforts, spreads between both short-term government securities and central bank policy rates, on the one hand, and short-term inter-bank borrowing costs on the other, have remained at wide levels while a lack of liquidity has pervaded both traded credit markets and secured and unsecured funding markets.

### 3| TOO MANY, RATHER THAN TOO FEW, EXPLANATIONS

In attempting to understand the causes of the current credit and liquidity "crunch", as well as potential remedies, we have a problem of too many rather than too few explanations.

Some have focused on the easy monetary conditions that preceded this episode and insist that only time and firm monetary policy are needed to purge the system of the excesses. Others point to the myriad complex agency problems in the securitization markets ranging from the loose lending standards by asset originators who lack sufficient incentive to police credit quality to excessive instrument complexity and failures of disclosure by asset packagers and distributors, compounded by a failure of the rating agencies to be sufficiently tough on the asset originators and distributors. Another line of analysis has focused on the apparent failure of bank liquidity risk management and concluded that both banks and bank regulators have given too much attention to solvency risk, particularly in work on bank capital requirements, and too little attention to liquidity risk.

Much of the initial attention by central banks and the authorities focused on the LIBOR and EURIBOR inter-bank lending markets and was premised on the belief that the market was "broken" and needed to be "fixed." This approach is problematic on two levels.

First, the very concept of a uniform inter-bank borrowing rate is a function of good times, and tends to come under pressure when the cycle turns. In the 1970s the short-term liabilities of the clearinghouse banks in the United States traded at the same levels but this consistency fell apart in the turbulence of the 1980s. The famous "convoy" of Japanese banks

all benefited from identically-priced liabilities in the late 1980s only to see this fall apart under the pressure of the post-bubble "lost decade" of the 1990s. If credit risk was being so poorly priced in the earlier years of this decade, maybe the inter-bank lending market was actually broken when so many had the benefit of identical and low borrowing costs and maybe the market is now in the process of being fixed by a greater attention to credit risks.

Second, elevated inter-bank borrowing costs should not be thought of as the disease itself but, rather, as the symptom. The initial rise in borrowing spreads was ascribed to uncertainty about asset values causing concern about the credit quality of borrowers, leading lenders to both raise rates and cut back on the quantities they were willing to extend. Given this credit premium, adding excess central bank reserves and lowering rates, by adding to the supply of liquidity, would presumably encourage lenders to make short-term credit available to borrowers. There is much to this line of analysis but it is critically incomplete.

Potential lenders were certainly concerned about the borrowers' credit quality and this was particularly evident in the withdrawal of support from the ABCP market. But the sudden rise in inter-bank borrowing costs, and the continued scarcity of short-term secured and unsecured funding, is much more a reflection of *lenders'* anxieties about their *own asset quality* and their *own balance sheets*. The rapid and synchronized back up in borrowing costs in Dollar, Sterling, and Euro inter-bank markets strongly suggests a linkage across the balance sheets of the major *lenders*, who operate in all three markets. Thus, even initially, the strains in money markets should be understood as significantly reflecting a lenders' strike by the major financial intermediaries –who are themselves borrowers, lenders and investors in the very same credit instruments.

## 4 | THE FAILURE OF RISK DISPERSION

Taking a step back, it seems clear that risk dispersion did not work as expected. The continued evolution of securitization and derivative instruments should, in principle, provide for a more efficient allocation

of risks to those who both can and want to hold them, providing for a more efficient allocation of capital in the economy and for financial stability through diversification. The practice of 2007, however, has been a disappointment. Indeed, given the widespread observation that risk in general, and credit risk in particular, was being mis-priced in recent years, how could market mechanisms be expected to achieve an efficient allocation of these risks?

Why did the outcomes fall so far short of the promise? There are two possibilities: first, investors did not understand the risks that they bought and, second, the intermediaries did not know which risks they had shed, retained or reacquired. A failure by investors to understand the risks that they acquired can have two possible causes: agency problems of misaligned interests and failures of disclosure, on the one hand, and excessive exuberance (or perhaps conscious avoidance) on the part of investors, on the other. A failure by intermediaries to understand the portfolio of risks that they retained or acquired through their various business lines would reflect fundamental risk-management errors in understanding the interactions and correlations of their on- and off-balance sheet exposures.

The correct answer is: "all of the above." But we should be much more surprised and worried by the risk-management failure of the intermediaries, who are the engines of the risk-dispersion process, than by the presence of agency problems and exuberant investors. It is of course desirable for investors to understand the investment risks that they acquire but if the institutions that stand at the center of the risk dispersion process do not understand what they are doing, the trouble runs much deeper.

*The role of agency problems.* The increasingly-refined division of labor in securitization markets does create greater opportunities for a misalignment of interests and for agency problems to occur.

Asset originators, who are at the point of contact with borrowers, but who are expecting to pool and offload individual loans, have a diminished incentive to assure the initial credit quality of the individual borrower and to monitor the borrowers' ongoing credit standing during the life of the loan. In some asset-backed markets, the original lender retains a residual exposure and/or has ongoing liabilities in

servicing the loan and ensuring ongoing compliance with credit guidelines. But in other markets, and with respect to some structured vehicles, this is not the case.

Asset packagers and distributors have incentives to understate the risks and overstate the rewards of investment products they sell. At the same time, the current cycle and the quest for yield seem to have encouraged products of tremendous complexity. While most markets have extensive disclosure requirements for investment products, accurate and useful disclosures have to be continuously revised to keep up with instrument innovation.

The rating agencies also appear to have contributed to investors' under-estimation of the risks in many of the more complex investment structures. The long-recognized agency problem inherent in the rating agency business model of being paid by issuers (rather than investors) are even more problematic in the case of complex structured vehicles as contrasted with the securities of a traditional corporate issuer. Corporate issuers are governed by executives and boards who are accountable for the business entity's ongoing performance and cash flows that underlie the securities they issue. Structured credit vehicles, on the other hand, stand on their own, almost like financial drones which, once launched, just keep going under their initial terms and conditions. At the same time, the division of interests of structured credit vehicles is highly complex and requires extensive modeling to analyze. As a consequence, investors are likely to rely even more heavily on third-party ratings to assess the risks of structured credit instruments. During the recent rapid expansion of structured credit issuance, the rating agencies encouraged investor acceptance by assigning their highest ratings to structured pools composed of much lower quality assets, effectively diluting the quality of their service –their "brand"– to an extraordinary extent.

The efficiency of risk dispersion would undoubtedly be improved if the interests of investors were better aligned with the agents that populate our capital markets. Credit underwriters in the asset origination process need incentives to adhere to lending standards and to continue to monitor credit quality. Retention of elements of risks shared with the ultimate investors, or contractual liabilities to maintain credit standards are effective in a number

of asset-backed markets and could be adopted in others. Securities regulators can and should consider improvements in disclosure requirements that might highlight the risks associated with structured credit instruments.

Securities regulators should also consider a thorough reform of the rating agency process. Shifting the alignment of the rating agencies' incentives from those of issuers to investors would improve the efficiency of capital markets (but would likely be strongly resisted by the agencies because it is so much easier to collect rents from issuers than from investors). For example, the rating agencies could shift to a publishing model in which ratings themselves would be made public but the analytic reports behind the ratings would have to be paid for by investors. (More radical changes in the structure of the accounting and stock analyst industries were engineered earlier in this decade). A greater number of ratings per investment issue, more intellectual capital and more competition would all be desirable objectives of reform as well.

*The role of investor behavior.* All of these agency problems are quite real and deserve further attention. Yet, when considering an investment transaction between an institutional buyer and an institutional seller, the most effective means of ensuring that investors understand the risk they incur is to make investors responsible for those risks by adherence to the principle of *caveat emptor* –buyer beware.

Other than in cases of fraud (or material misrepresentation), how can anyone other than the institutional investor be responsible for understanding the risks they incur? Indeed, the premise that both economic efficiency and financial stability will be served by the dispersion of risks to those both willing and able to bear them rests on the assumption that risk appetites and risk tolerance will be *idiosyncratic to particular investors*.

Investors are under no compulsion to buy any particular investment. Given information asymmetries in the retail markets, an investor protection approach to regulate relations between institutional sellers and individual buyers makes a great deal of sense. But among institutional buyers and sellers, any information asymmetry between them can be resolved by the prospective buyer demanding more information, investing in their

own information and analytic capabilities or, finally, by declining to make the purchase.

Subprime mortgages are made to borrowers with lower credit ratings or who are taking on larger loans than would otherwise be deemed creditworthy. Alt-A mortgages –known as “liars’ loans”– are made to borrowers who have not completed all of the normal credit checks and lending documents. What additional disclosures or information would an investor require to be informed that securities backed by pools of these mortgages might carry greater risks and be subject to higher rates of default than those of other mortgages?

When investors are offered instruments with higher returns than those prevailing on similar instruments, it should be understood that they carry with them higher risks as well and that the higher return speaks for itself –*res ipsa loquitur*– in delivering a higher level of risk. If institutional investors are not prepared to take the time and the expense to analyze and understand the risks they incur, they will have to bear the expense of losses beyond their expectations.

It is worth noting that a number of major, supposedly-sophisticated banks were victims of the same asset-valuation optimism that infected other investors, as evidenced by the significant balance-sheet mark downs of subprime and CDO exposures that many have experienced in 2007. Reversing the over-valuation of assets is how losses in financial markets can exceed the losses from defaults on the underlying cash flows: marking down an asset value whose price reflected either too low a probability of default or too optimistic an expectation for its purchase in the secondary market can cause losses to the holder of the asset even though the underlying borrower is still in good standing.

*The role of the risk distributors.* When we reflect on the failure of risk dispersion, we should be much more troubled by the idea that the major financial firms –the very institutions at the center of the process of risk dispersion through securitization and derivative markets– do not appear to have understood the portfolio of exposures that they had either retained or acquired.

At its most basic level this reflects a profound risk-management failure on the part of leading banks

to understand the portfolio of on- and off-balance sheet exposures they were running and, especially, how the *velocity* of their off-balance activities would affect their on-balance sheet exposures “when the music stopped.” Accounting rules intended to reduce the potential for off-balance sheet abuses, such as those that occurred at Enron, have added an additional layer of complexity to the banks’ ability to determine what is on- and off-balance sheet.

There may have been a failure of many firms to appreciate the liquidity risks that they were incurring and a trend of taking for granted both their ability to fund and their ability to adjust positions in traded markets. Greater attention to liquidity risk might have somewhat reduced the market strains but would have been an incomplete answer to the risk management failures that contributed to this episode. Their fundamental failure was in not understanding how different lines of business would interact. Put differently, a precondition for designing an effective stress test is a through understanding of the constituent exposures thrown off by each business.

Consider the following sequence of a bank in multiple lines of business. Real rates and volatility rise, leading the bank to reduce the credit it is extending to hedge funds against the collateral of subprime mortgages and CDOs (a reduction in on-balance sheet assets). The subsequent decay in asset values (as other banks also reduce exposures to hedge funds at the same time) causes on-balance sheet losses to the same assets held for the bank’s own account and off-balance sheet losses in SIVs or conduits to which the bank has extended backup credit lines supporting their ABCP programs. When demand for ABCP declines, the bank loses underwriting fees (off-balance sheet income) and finds the vehicles calling on their backup line of credit (converting an off-balance sheet claim into an on-balance sheet asset). As demand for the underlying collateral falls, mortgages and leveraged loans that the bank was originating and expecting to sell on to investors start to accumulate either on the bank’s balance sheet or the bank’s own conduits, requiring funding at precisely the same time that the bank is confronted with demands for balance sheet space from clients.

In brief, while the bank is experiencing its own on-balance sheet losses, which will eat into earnings, and possibly capital, it is confronted with the drying up



of off-balance sheet fee income and the conversion of off-balance sheet exposures into on-balance sheet ones, resulting in further demands on the bank's capital. What appears to have been lacking, underdeveloped, or receiving insufficient management attention, was the ability to simultaneously stress test on- and off-balance sheet assets and liabilities, and to understand how the stress scenario would influence the volume of off-balance sheet fee-generating activities and the velocity of off-balance sheet asset creation. A comprehensive view of a bank's liquidity and solvency risks would be the product of such a stress test.

Anticipating the interaction of banks' on- and off-balance sheet exposures has been made more complex by revisions to accounting rules. When the credit cycle turns, and losses mount, there are always difficult conversations between bankers and their accountants about the recognition of losses and the consolidation of exposures onto balance sheets. But following the collapse of Enron and the other corporate scandals, both US and international accounting rules have been extensively revised to provide greater guidance on when and how off-balance sheet vehicles may be consolidated (FIN46(R), IAS 27 & SIC 12). In an effort to reduce the potential for abuse, these rules have been made more complex and their interpretation is contingent on changing circumstances.

*The role of the authorities.* Before governments and regulatory authorities consider reforms to address the turbulence of 2007 they should take a step back and reflect that the quarter century of efforts to improve the safety and soundness of the banking system through the creation of risk-based capital rules has coincided with the progressive disintermediation of the banking system and a continuous movement of risks off of bank balance sheets. The evolving division of labor among asset

originators, distributors and managers, the creation of mortgage-related and asset-backed securities, and the proliferation of stand-alone, risk-bearing vehicles –from hedge funds, to conduits, to SIVs and CDOs and CLOs– have all served the purpose of removing risks from bank balance sheets and, directly or indirectly, lowering the explicit bank capital needed to support these activities.

If the dispersion of risk away from a bank-centric credit process is both *efficient* and *effective* it would, in principle, contribute to financial and macro-economic stability. An efficient process would be one that accurately prices and distributes risk to those more able and willing to hold those risks. An effective process would be one that diversified those risks in an enduring manner away from the critical functions of credit creation. On the evidence of 2007, the system appears to have failed on both counts and, under stress, rolls both credit losses and funding pressures back onto the very balance sheets that supposedly had shed the risks. It may, however, still be too early to distinguish the excesses of the cycle from flaws in the process.

Governments, central banks and regulatory authorities also face the more immediate task of balancing the risks of being too permissive with respect to off-balance exposures against the risk of causing too-rapid a de-leveraging and the consequent credit contraction that this would imply. Financial institutions are now absorbing their on- and off-balance sheet losses and exposures and many are absorbing the additional demands of their clients who need to shed assets or for funding that can no longer be secured in commercial paper markets. If market participants come to expect that accounting, solvency or liquidity rules might soon be tightened in response to the events of 2007, the liquidity and credit crunch experienced so far might be only the beginning.